International Court of Arbitration of the
International Chamber of Commerce
Case No. 21747/RD/MK/PDP

Arbitration between

REFINERÍA DE CARTAGENA S.A.

(COLOMBIA)

CLAIMANT

and

1. CHICAGO BRIDGE & IRON COMPANY N.V.

(THE NETHERLANDS)

2. CB&I UK LTD.

(UNITED KINGDOM)

3. CBI COLOMBIANA S.A.

(COLOMBIA)

RESPONDENTS

FINAL AWARD

The Arbitral Tribunal

Juan Fernández-Armesto (President)
Andrés Jana Linetzky (Co-arbitrator)
Sir Vivian A. Ramsey (Co-arbitrator)

Administrative Secretary
Deva Villanúa

Deputy Administrative Secretary
Adam Jankowski

June 2, 2023

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GLOSSARY

54 Documents	54 email communications, charts and additional materials from the *Contraloría* Proceeding
Administrative Costs	Fees and expenses of the arbitrators and the ICC administrative expenses fixed by the Court
Answer to the RfA and Counterclaim	Respondents' Answer to the RfA, dated May 25, 2016
Anticipated/Forecast Labour Invoices	Monthly advance payments for labour costs under the EPC Contract
April 2010 Schedule	Project Schedule prepared by CB&I, as updated in April 2010
B&O'B	Baker & O'Brien
Bargaining Agreement	Collective Bargaining Agreement between USO and CB&I, dated September 23, 2013
Big West	Big West oil refinery
BL	The Bill of Lading, a document necessary for the processing a freight shipment.
Blended Requests for Relief	Requests for Relief by the Parties as subsumed by the Tribunal
BofD	Board of Directors
BPD	Barrels per day
BRNs	Budget Revision Notices
CCC	Colombian Civil Code
Certifications and Completions Procedure or **CCProcedure**	Certifications and Completions Procedure for the Cartagena Refinery Expansion Project, last dated August 15, 2014
Citigroup	Citigroup Global Markets Inc.
Claimant or **Reficar**	*Refinería de Cartagena S.A.*
Claimant's Reply to Counterclaim	Claimant's Reply to Counterclaim, dated June 27, 2016
Claimant's Request for Interim Measures	Claimant's Request for Emergency Conservatory and Interim Measures, dated November 27, 2019
Claimant's Responsibility Events	An event causing Excess Cost arising out of Reficar's instructions, fault or lack of diligence
Claimant's Supplemental Response to Counterclaim	Claimant's supplemental response to Respondents' Counterclaim, dated October 16, 2021
Claimant's Updated Statement of Claim Amounts	Claimant's update of the amounts claimed in the Statement of Claim, dated March 12, 2021
CMT	Construction Management Team
Colombian Supreme Court	Colombian Supreme Court of Justice
Communication Interim Measures	The interim measures ordered by the Tribunal on September 7, 2020
Consorcio Ferrovial	*Consorcio Ferrovial SAINC v. Carbones del Cerrejón Limited*
Contested Documents	Documents contested by the Parties in connection with the *Contraloría* proceedings, filed up to the point of the Second Written Submissions
Contraloría	The Colombian *Contraloría General de la República*
***Contraloría* File**	The case file pertaining to the *Contraloría* Proceeding

***Contraloría* Proceeding**	The Ordinary Fiscal Liability Proceeding of the *Contraloría* against Respondents
Coordination Agreement	An agreement executed by Reficar, CB&I UK and CBI Colombiana, governed by New York law, providing for the coordination of obligations under the Onshore and Offshore Contracts and the resolution of any interpretation conflicts
Cost Control Commitments	CB&I's obligations under the Contract to control the Project costs by only submitting for reimbursement reasonable, proper costs incurred in accordance with the Contract, and by treating Reficar's resources as if their own
Court	The International Court of Arbitration of the ICC
CPHB	Claimant's first Post-Hearing Brief
CPHB2	Claimant's second Post-Hearing Brief
CRWs	Cost-Reduction Workshops
Cut-Off Date	December 31, 2011
CWS	Witness Statement of a fact witness for Claimant
Delay Change Order	Change Order 222
Deviation Rules	Completions Procedure Agreed Deviation, dated July 7, 2014
DOR Matrix	Division of Responsibility Matrix contained in Section 2 of the Procurement Execution Plan titled "CB&I Entities and Responsibilities"
DPS	Document Production Schedule(s)
DRA	The Dispute Resolution Agreement between the Parties
Draft Hearing Protocol or **DHP**	The text of the draft protocol for the Hearing, which had been proposed jointly by the Parties
Edificio Centro de Comercio Internacional	*Edificio Centro de Comercio Internacional v. INHISA S.A.*
EPC	Engineering, procurement and construction
EPC Agreement(s), EPC Contract(s) or simply **Contract** or **Agreement**	The six agreements between Reficar and CB&I, dated June 15, 2010
ER	Expert Report
Excess Costs	The amounts of money CB&I invoiced to and collected from Reficar, in alleged breach of CB&I's Cost Control Commitments, which Reficar is now claiming back
Excluded Costs	Items, for which CB&I, notwithstanding its breach of the Cost Control Commitments, should not bear responsibility, because these Excess Costs were caused by factors outside its scope of control
Execution Masterplan	Cartagena Refinery Expansion Project Master Project Execution Plan
Exhaustive Defense to Counterclaim or **Counterclaim Defense** or **EDOCC**	Claimant's Exhaustive Defense to Respondents' Statement of Counterclaim, dated June 28, 2019
Exhaustive Statement of Claim or **ESOC**	Claimant's Exhaustive Statement of Claim, dated March 16, 2018
Exhaustive Statement of Counterclaim or **ESOCC**	Respondents' Exhaustive Statement of Counterclaim, dated March 16, 2018
Exhaustive Statement of Defense to Claim or **ESOD**	Respondents' Exhaustive Statement of Defense to Claimant's Statement of Claim

February 2010 Estimate	CB&I's Revision 2 – Final Estimate Scope to the July 2009 Estimate, dated February 28, 2010
FEED	Font End Engineering Design
FEL	Front End Loading
Final Award and **Award**	The current Final Award, dated June 2, 2023
First and **Second Alternative**	The two alternative decisions adopted by the Tribunal in PO No. 2
First Block	The first part of the Hearing period, eventually held from May 17 to June 4, 2021
First Written Submissions	The Non-Exhaustive Statement of Claim and Statement of Counterclaim jointly
FMM	*Formulario de Movimiento de Mercancias,* a Colombia-specific certificate confirming that the goods had entered the Free Trade Zone.
Foster Wheeler	Foster Wheeler USA Corporation and Process Consultants, Inc.
FTZs	Free Trade Zones
Green Book	The IChemE Green Book for Reimbursable Contracts
ha	Hectare(s)
Heightened Diligence Obligation	Para. 3 of the Project Execution Plan, under which CB&I pledged to rigorously control cost and schedule, in a similar way to a lump sum contract, and to safeguard Reficar's resources as if their own
Hearing Protocol or **HP**	The finalized protocol of the Hearing
Hearing Summary Submission	Each Party's submission summarizing its respective position in preparation of the Hearing
ICC	The International Chamber of Commerce in Paris
ICC Rules	The Arbitration Rules of the ICC in force as from January 1, 2012
Improper Delay Claim	Reficar's claim for damages caused by the delays in the Mechanical Completion of the Project
IPA	Independent Project Analysis Inc.
Jacobs	Jacobs Consultancy
Joint Exhibits	A number of joint exhibits of certain voluminous evidence submitted jointly by Claimant and Respondents
Joint Expert Reports	Joint expert reports submitted by the Parties pursuant to Communication A 66
July 2009 Estimate	Estimate Basis Document "CB&I Scope" for the Cartagena Expansion Project Class II (+/-10%) Cost Estimate, dated July 31, 2009
KBC	KBC Advanced Technologies
KG	Kenrich Group
Large Crane	The TC-36000 crane
Legal Costs	Reasonable legal costs incurred by each Party in the furtherance of the arbitration
Liability Cap	Limitations of the Contractor's liability under the EPC Contract
Liquidation Date	The date as of which the EPC Agreement is deemed to be liquidated
Liquidator	The Liquidator of CBI Colombiana
Liquidator's Response	The Liquidator's Response to a request of the Tribunal concerning several documents, dated November 11, 2020
List of Demands	USO's formal list of 22 demands to CB&I

LOI	Letter of Intent
LSTK	Lump Sum Turn Key
Mechanical Completion Date	Date on which all Subsystems on the Project achieved Mechanical Completion
McDermott	McDermott International, Inc.
MOA	Memorandum of Agreement, entered into in February 2014
Monthly Forecasts	An estimate of the total EPC costs that Reficar would incur until the finalization of the Project, and of the necessary schedule, submitted as a monthly forecast to be provided by CB&I to Reficar
MRR	The Material Receiving Report, a description of the goods and quantities
New York Law	The law of the State of New York
Nexant	Nexant Chem Systems Limited
Non-Exhaustive Defense to Counterclaim or **NEDOCC**	Claimant's Non-Exhaustive Defense to Respondents' Statement of Counterclaim, dated March 16, 2018
Non-Exhaustive Statement of Claim or **NESOC**	Claimant's non-exhaustive Statement of Claim, dated April 28, 2017
Non-Exhaustive Statement of Defense or **NESOD**	Respondents' non-exhaustive Statement of Defense to the Non- Exhaustive Statement of Claim, dated March 16, 2018
OCNs	Other Country Nationals
October 2010 Re-Baseline Schedule	Project Schedule, as completed in October 2010
Offshore Contract	One EPC Contract governed by New York law, for design, engineering, procurement and other work performed by CB&I UK primarily outside of Colombia
Offshore Parent Guarantee	A parent guarantee between Reficar and CB&I N.V., governed by New York law, for CB&I UK's obligations under the Offshore Agreement
Onshore Contract	One EPC Contract governed by Colombian law, for work (mainly construction) performed by CBI Colombiana in Colombia
Onshore Parent Guarantee	A parent guarantee between Reficar and CB&I N.V., governed by New York law, for CB&I Colombiana's obligations under the Onshore Agreement
Oral Closings	Session of closing oral arguments
Parties	Claimant and Respondents jointly
Pathfinder	Pathfinder LLC
PCS	Pre-Commissioning and Start-Up
Performance LoC	Performance Letter of Credit
PFs	Productivity Factors
PIP	Project Invoicing Procedure
PO	Procedural Order
Política Salarial	Procedure for the Implementation of the Salary Policy of Reficar S.A. Applicable to Employees of Contractors during the Construction of the Cartagena Refinery and Expansion Project
Powell	Powell Electrical Systems
Pre-Contract Claim	Reficar's claim that it was tricked by CB&I into changing the remuneration scheme of the contract, from lump sum to cost reimbursable
Presentations	The in-house attorney's presentations to Claimant's BofD
Project or **Refinery Project**	The Refinery modernization and expansion Project

Project Definition Contract	The contract for phases FEL-2 and FEL-3 (or the FEED), with the goal of developing the Project scope and schedule, and an LSTK price
Reasonable Cost Benchmark	A level of costs which represents a reasonable estimate on how much the project should have cost
RC or **cost plus**	Cost-reimbursable
Reficar Budget or **Budget**	The limited budget under which Reficar and Ecopetrol operated
Refinery	The Cartagena Refinery
Remaining Documents	The remaining documents from the *Contraloría* File, subject to a decision in PO No. 3
Reply to the Non-Exhaustive Statement of Defense or **Reply**	Claimant's Reply to Respondents' Non-Exhaustive Statement of Defense, dated June 28, 2019
Respondents' Reply to the Non-Exhaustive Statement of Defense to Counterclaim or **Respondents' Reply on Counterclaim**	Respondents' Reply to Claimant's Non-Exhaustive Defense to Counterclaim, dated June 28, 2019
Representation Forecast	The December 2011/January 2012 Forecast
Representation Letter	CB&I's letter to Reficar, signed by its Project Director, Mr. Deidehban, in which CB&I reiterated the validity of the USD 3.971 billion cost Forecast, dated May 22, 2012
Respondent 1 or **CB&I N.V.**	*Chicago Bridge and Iron Company N.V.*
Respondent 2 or **CB&I UK**	*CB&I UK Ltd.*
Respondent 3 or **CBI Colombiana**	*CBI Colombiana S.A.*
Respondents	Respondents 1-3 jointly
Respondents' Opposition to Claimant's Request for Interim Measures	Respondents' opposition statement to Claimant's Request for Interim Measures, dated December 16, 2019
RfA	Claimant's Request for Arbitration, dated March 8, 2016
ROM or **Rough Order of Magnitude**	Late adds, deletes and changes in the February 2010 Estimate
RPHB	Respondents' first Post-Hearing Brief
RPHB2	Respondent's second Post-Hearing Brief
RWS	Witness statement of a fact witness for Respondents
Second Block	The second part of the Hearing period, eventually held from June 28 to July 16, 2021
Schedule Control Commitments	CB&I's obligations under the EPC Contract to achieve Mechanical Completion by the Mechanical Completion Date and to use its best efforts in controlling the Project Schedule
SOFR	Secured Overnight Financing Rate
Solicitud	*Derecho de petición - solicitud de información y copias de documentos de proceso de responsabilidad fiscal*
Statement of Counterclaim	Respondents' Statement of Counterclaim, dated April 28, 2017
SDS	The Colombian *Superintendencia de Sociedades*
Synergy Changes	The scope changes in the Project, precisely the deferral or deletion of certain units (mostly gasoline-producing upgrades) and the expansion of others, after Glencore's exit from the Project in May 2009

Third Written Submissions	The Written Submissions made on June 28, 2019 jointly
Total Contested Documents	Contested Documents together with 29 additional documents objected to by Claimant on July 16, 2018
TofR	The Terms of Reference, dated October 28, 2016
Tr.	Hearing transcript (page:line format)
***Tutela* Proceeding**	The public *acción de tutela* filed against the *Contraloría* by Foster Wheeler before the 26th Criminal Circuit of Bogotá
Unpredictable Events	An event which was not under Respondents' control
USGC	US Gulf Coast (1972) standard work hours
USO	*Unión Sindical Obrera de la Industria del Petróleo*
Walkdown	Inspection of a Unit or Subsystem
Walkdown Notice	Notice of Walkdown
Work Completion Claim	Reficar's claims in relation to the completion of the Works as well as the correction of defects
WMC	Watson Millican
WNOC	Written Notices of Change

I. PERSONS INVOLVED IN THE ARBITRATION

1. THE PARTIES

1.1. CLAIMANT

1. The Claimant is REFINERÍA DE CARTAGENA S.A., a Colombian company ["**Claimant**", "**Reficar**"] with principal place of business in Cartagena, Colombia, specialized in the refinement of crude oil and owner of the refinery that is subject to this dispute. Its registered office is:

   Carretera a Pascaballos Km 12

   Zona Industrial de Mamonal

   Cartagena D.T. y C. (Bolívar)

   Colombia

   Notices to be sent to:

   Carrera 14, No. 85 – 68, Oficina 606

   Bogotá D.C., Colombia

2. Claimant is represented in this arbitration by Mr. Mike Stenglein, Mr. Adam L. Gray and Mr. Matt Vandenberg from KING & SPALDING LLP[1]:

   KING & SPALDING LLP

   Mike Stenglein

   Adam L. Gray

   Matt Vandenberg

   500 W. 2nd Street, Suite 1800

   Austin, TX 78701

   Prior to August 3, 2018 Claimant had also been represented by Mr. Daniel Posse of POSSE HERRERA & RUIZ but the law firm was replaced by SUESCÚN ABOGADOS and Santiago Martínez Méndez from GODOY CÓRDOBA on that date[2]. The latter ceased to represent Claimant as of September 10, 2018[3]. The latest update from Claimant no longer lists SUESCÚN ABOGADOS as one of its representatives[4].

1.2. RESPONDENTS

[1] Communication C-235.
[2] Communication C-44.
[3] Communication C-49.
[4] Communication C-235.

3. The Respondents in these proceedings are three companies. Respondents 1 to 3 will be jointly referred to as "**Respondents**".

1.2.1. RESPONDENT 1

4. Respondent 1 is CHICAGO BRIDGE AND IRON COMPANY N.V. ["**Respondent 1**" or "**CB&I N.V.**"], a Dutch company with operative headquarters in Houston, Texas that was entrusted with building Reficar's refinery in Cartagena. It provides conceptual design, technology, engineering, procurement, fabrication, construction and commissioning services to customers in the energy, petrochemical and natural resources industries. On May 10, 2018 CB&I N.V. merged with McDermott International, Inc. ["**McDermott**"][5]. Its address for correspondence is[6]:

   McDermott International Holdings B.V.

   Prinses Beatrixlaan 35

   2595AK, The Hague

   Netherlands

1.2.2. RESPONDENT 2

5. Respondent 2 is CB&I UK LTD. ["**Respondent 2**" or "**CB&I UK**"] a limited liability company existing and incorporated under the laws of the United Kingdom, 100%-wholly-owned subsidiary of Respondent 1, providing design, design-build, engineering, fabrication, procurement, construction and maintenance services for oil and gas, power, and allied industry projects in, among other places, South America. Its contact details[7] are as follows:

   CB&I UK Limited

   2 New Square Bedfont Lakes Business Park

   Feltham, Middlesex

   United Kingdom

1.2.3. RESPONDENT 3

6. Respondent 3 is CBI COLOMBIANA S.A. ["**Respondent 3**" or "**CBI Colombiana**"], a legal entity of private law existing and incorporated under the laws of Colombia, 100%-wholly-owned subsidiary of Respondent 1, providing among other things, general contracting services such as constructing large projects. Its registered office and contact details[8] are as follows:

   CBI Colombiana S.A.

   Avenida 82 No. 10 – 62, Piso 6

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[5] Ex. C-1865, p. 12 (pdf p. 14).
[6] Communication R-220.
[7] Communication R-220.
[8] Letter from the Liquidator dated November 11, 2020.

Bogotá, Colombia

7. Prior to March 8, 2017, Respondents had also been represented by Mr. James L. Loftins and Timothy J. Tyler of VINSON & ELKINS, LLP but the law firm ceased to represent them on that date[9].

8. On June 29, 2020, Respondents informed the Tribunal that the Colombian *Superintendencia de Sociedades* [the "***SDS***"] had ordered the judicial liquidation of CBI Colombiana[10]. According to Respondents, CBI Colombiana had not been notified about this action by the *SDS* and Respondents learned about it through Colombian media.

9. On July 21, 2020, the *SDS* appointed Mr. Enrique Gómez Martínez as the Liquidator of CB Colombiana [the "**Liquidator**"][11].

10. The Tribunal issued two letters to the Liquidator, after hearing the Parties and sending the respective drafts to them for comments, in which it invited him to inform the Tribunal whether he would participate in the arbitration proceedings on behalf of CBI Colombiana, and requested that he provide relevant documents to support his status as the Liquidator[12].

11. On November 11, 2020, the Liquidator answered the Tribunal's letters, indicating that CBI Colombiana would "keep on participating in the referred procedures and maintains all the previous arguments, defenses and claims presented before the tribunal and henceforth adheres to all arguments, defenses, writs, requests and filings presented by [CB&I]", and that it "shall not appoint counsel for the proceedings"[13].

12. On January 21, 2021, the Tribunal sent a third communication to the Liquidator, after sending a draft version to the other Parties for comments[14]. In this third letter, the Tribunal informed the Liquidator that, by stating in the Liquidator's Response that CBI Colombiana "adheres" to all past and future arguments, defenses, writs, requests and filings presented by CB&I, Respondent 3[15]:

    - Has consented to and ratified all past arguments, defenses, writs, requests, and filings presented by CB&I; and

    - Will adopt any future arguments, defenses, writs, requests, and filings presented by CB&I and, for this reason, CB&I will not be required to solicit or request CBI Colombiana's consent in advance.

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[9] Communication R-21.
[10] Ex. R-0110.
[11] See *Auto* of July 21, 2020, *Expediente* 68.336, attached to the Liquidator's letter dated November 11, 2020. The Tribunal notes that according to the same *Auto*, the previous person appointed to serve as the Liquidator – Mr. Ricardo Echeverri López – did not accept his appointment.
[12] Arbitral Tribunal's letter to the Liquidator of October 11, 2020; Arbitral Tribunal's letter to the Liquidator of November 3, 2020.
[13] Letter from the Liquidator dated November 11, 2020.
[14] Third Letter to the Liquidator of January 21, 2021.
[15] Third Letter to the Liquidator of January 21, 2021, para. 4.

13. The Tribunal also requested the Liquidator to promptly inform the Tribunal if such understanding was incorrect. Additionally, the Tribunal also informed that all communications sent to CBI Colombiana would be addressed to the following emails[16]:

Attn: Mr. Enrique Gómez Martínez
(enriquegomez@zurekgomezabogados.com)

With copy to: Mr. Juan Gaitán
(juan.gaitan@zurekgomezabogados.com), and

Joaquín Londono
(joaquinlondono@zurekgomezabogados.com).

14. On March 28, 2023, the President received a letter from Mr. Camilo Alberto Guzmán Prieto, announcing his role as the new Liquidator of CBI Colombiana ["**New Liquidator**"], and attaching the power of attorney granted to Dr. Gustavo Adolfo Romero Torres ["**Legal Representative**"] for the purpose of representation of CBI Colombiana in the current proceedings[17]. The New Liquidator and the Legal Representative have provided the following addresses for notification:

Camilo Alberto Guzmán Prieto

CC 79205016

Calle 82 No. 19 A 14 Piso 3

Bogotá-Colombia
(depositariocguzman@gmail.com)

and

Dr. Gustavo Adolfo Romero Torres

(gustavoromero64@hotmail.com).

* * *

15. Respondents 1 and 2 are represented in this arbitration[18] by Mr. Stephen B. Shapiro, Ms. Cheryl A. Feeley, Ms. Jessica L. Farmer, Ms. Anna P. Hayes, Mr. Enrique Gómez-Pinzón, Mr. Juan I. Casallas, Mr. Benjamin Wilson, Mr. Stosh M. Silivos, Mr. Jamie J. Hansen, from HOLLAND & KNIGHT LLP and Mr. Thomas F. Holt Jr., Mr. Christopher J. Valente, Mr. Mark E. Haddad, Mr. John C. Blessington, Ms. Lindsay S. Bishop, Mr. Richard F. Paciaroni, Ms. Martha J. Dawson and Mr. Matthew E. Smith from K&L GATES LLP, with notifications and communications to be made at:

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[16] A 130; Arbitral Tribunal's letter to the Liquidator dated January 21, 2021.
[17] Communication A 176 with attachments.
[18] Holland & Knight LLP and K&L Gates LLP withdrew as counsel for CBI Colombiana on September 15, 2020.

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Cheryl A. Feeley

Jessica L. Farmer

Anna P. Hayes

HOLLAND & KNIGHT LLP

800 17th Street, N.W., Suite 1100

Washington, DC 20006

Enrique Gómez Pinzón

Juan I. Casallas

HOLLAND & KNIGHT LLP

Carrera 7 # 71-21, Torre A, Piso 8

Bogotá DC, Colombia

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Pittsburgh, PA 15222

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Dubai, United Arab Emirates

Martha J. Dawson

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Seattle, WA 98104

Matthew E. Smith

K&L GATES LLP

One New Change London EC4M 9AF

England

* * *

16. Claimant and Respondents will be jointly referred to as the "**Parties**".

2. THE ARBITRAL TRIBUNAL

17. On July 18, 2016, the Secretary General of the International Court of Arbitration of the International Chamber of Commerce ["**Court**" of the "**ICC**"] confirmed Mr. Andrés Jana Linetzky as co-arbitrator upon the nomination by the Claimant, pursuant to Art. 13.2 of the Rules of Arbitration of the ICC in force as from January 1, 2012 [the "**ICC Rules**"].

18. On July 18, 2016, the Secretary General of the Court confirmed Sir Vivian A. Ramsey as co-arbitrator upon the joint nomination of the Respondents, pursuant to Art. 13.2 of the ICC Rules.

19. On August 19, 2016, the Secretary General of the Court confirmed Mr. Juan Fernández-Armesto as President of the Arbitral Tribunal upon the joint nomination of the co-arbitrators, pursuant to Art. 13.2 of the ICC Rules.

20. The arbitrators stated that notifications and communications arising in the course of the arbitration should be made at:

Andrés Jana Linetzky
JANA & GIL DISPUTE RESOLUTION
Av. Andrés Bello 2711, Piso 9
Las Condes
Santiago 7550611, Chile
E-mail: ajana@jg-disputes.com

Sir Vivian A. Ramsey
The Old Vicarage, School Lane
Swanley Village
Kent BR8 7PJ, United Kingdom
E-mail: varamsey@aol.com

Juan Fernández-Armesto
ARMESTO & ASOCIADOS
General Pardiñas 102, 8º izda.
28006, Madrid, Spain
E-mail: jfa@jfarmesto.com

3. THE SECRETARIAT OF THE COURT

21. The administration of this arbitration was granted to the Secretariat of the Court, initially in the persons of Rocío Digón and Marek Krasula and finally in the person

of Paul Di Pietro, who acted as Counsel for the case management. All notifications and communications should be addressed at:

Paul Di Pietro
INTERNATIONAL COURT OF ARBITRATION
INTERNATIONAL CHAMBER OF COMMERCE
SICANA, Inc.
140 East 45th Street, Suite 14C,
New York, NY 10017, USA
E-mail: ica9@iccwbo.org

4. THE ADMINISTRATIVE SECRETARY AND DEPUTY ADMINISTRATIVE SECRETARY

22. On October 17, 2016, the Parties agreed to the appointment of Mrs. Deva Villanúa as Administrative Secretary[19]. On August 31, 2018, the Tribunal proposed to appoint Ms. Bianca McDonnell as Deputy Administrative Secretary which both Parties accepted[20]. Ms. McDonnell renounced on March 3, 2020[21]. On December 16, 2020, the Tribunal proposed to appoint Mr. Adam Jankowski as Deputy Administrative Secretary which both Parties agreed to. All notifications and communications should be addressed at:

Deva Villanúa
DEVARB
Príncipe de Vergara 109
28002 Madrid, Spain
E-mail: deva.villanua@devarbitration.com

Adam Jankowski
ARMESTO & ASOCIADOS
General Pardiñas 102, 8º izda.
28006 Madrid, Spain
E-mail: ajj@jfarmesto.com

[19] Communications C-13 and R-11.
[20] Communication A 44, Communications C-50 and R-59.
[21] Letter to the Parties of 3 March 2020.

II. PROCEDURAL HISTORY

23. This arbitration first started in 2016. The anomalous duration of these arbitral proceedings is due to a multitude of procedural incidents and the extreme complexity of the case at hand.

24. The Tribunal has so far issued 156 communications containing decisions regarding procedural incidents and four Procedural Orders. The Parties have presented over twenty substantive submissions in total, and over 200 communications each.

25. It is impossible to summarise each submission, communication and decision in this chapter devoted to recapitulating the procedural history. The Tribunal, however, confirms that it has carefully analysed all submissions, communications and evidence submitted by the Parties and that all decisions are reasoned on the basis of such submissions.

1. ARBITRATION AGREEMENT

26. The present arbitration arises out of or in connection with the EPC Contract [the "**EPC Agreement(s)**", "**EPC Contract(s)**" or simply "**Contract**" or "**Agreement**"] for the expansion and modernisation of the Cartagena Refinery [the "**Refinery**"], entered into between Claimant and Respondents on June 15, 2010.

27. By Request for Arbitration dated March 8, 2016 ["**RfA**"], Reficar sought to initiate arbitration proceedings against Respondents, under Section 4 of the Dispute Resolution Agreement ["**DRA**"] between the Parties, which contains the following arbitration clause[22]:

> "4 Arbitration Agreement
>
> 4.1 Any Dispute not amicably resolved by the Parties pursuant to the terms of Clause 3 of this Agreement must be referred to and finally resolved by arbitration administered by the ICC and conducted under the ICC Rules as modified by this Agreement. The taking of evidence and the disclosure of documents shall be in accordance with the IBA Rules on the Taking of Evidence in International Commercial Arbitration (1 June 1999).
>
> 4.2 A Party wishing to refer a Dispute to arbitration shall file a Request as a Claimant in accordance with the ICC Rules, without designating an arbitrator.
>
> 4.3 Each Respondent shall file its Answer in accordance with the ICC Rules. If there are two or more Respondents they may agree to file a joint Answer.
>
> 4.4 The Arbitral Tribunal shall comprise three persons. The Claimant and the Respondent shall each be entitled to nominate one member (together, the "Nominated Arbitrators") of the Arbitral Tribunal to the ICC for appointment. If a Party fails to appoint its Nominated Arbitrator within 30 days of the date

[22] JX-007, pdf pp. 8-13.

of filing of the Answer by the Respondent, the missing Nominated Arbitrator shall be chosen by the ICC.

The third arbitrator (the "Independent Arbitrator") shall be chosen by the Nominated Arbitrators. If the Independent Arbitrator is not chosen by the Nominated Arbitrators within 30 days of the date of confirmation, by the ICC, of the appointment of the later of the two Nominated Arbitrators, the Independent Arbitrator shall be chosen by the ICC.

4.5 When appointing the Arbitral Tribunal, the Claimant and the Respondent (in respect of the Nominated Arbitrators) and the Nominated Arbitrators or the ICC Court (as applicable, in respect of the Independent Arbitrator), applying Articles 9(1) and 10(2) (or their replacements) of the ICC Rules where appropriate, shall be at liberty to appoint any person it or they regard, expressly taking into account the nature of the relevant Dispute or Disputes and the Project Agreements, as having suitable skills and experience to act as arbitrator in relation to the Dispute or (if relevant) the Disputes. The Independent Arbitrator shall be fully fluent in English and Spanish. In order to assist the Nominated Arbitrators or the ICC Court, as applicable, with the appointment of the Independent Arbitrator, the Claimant shall provide to the Secretariat (upon filing a Request pursuant to the ICC Rules) or the Nominated Arbitrators (upon confirmation by the ICC of their appointment), as applicable, a copy of this Agreement and the identity of any Parties added to or removed from this Agreement under Clause 6 together with a written request that the Independent Arbitrator, prior to signing a statement of independence pursuant to Article 7.2 of the ICC Rules, be required to consider the identities of the Parties listed in Appendix 2 and the changes, if any, thereto under Clause 6. The statement of independence shall be completed as if all Parties to this Agreement were parties to the Dispute(s) and the prospective Independent Arbitrator shall be made aware that he or she may, if appointed to determine a Dispute, be requested also to determine any other Dispute between any or all such Parties.

4.6 When considering the identity of the person to be appointed as the Independent Arbitrator in relation to a Dispute, the Nominated Arbitrators or the ICC Court, as applicable, shall take account of any representations any Party may make as to (i) whether or not there is, or is likely to be, any other Dispute which is related to the Dispute, and (ii) as to the subject-matter or nature of such actual or potential other Dispute.

4.7 If the Nominated Arbitrators and the Independent Arbitrator are of the opinion that there may be, prima facie, (i) one or more common issues of fact or law which may arise in determining the Dispute and any other Dispute, (ii) a risk of conflicting awards or legal obligations in resolving a Dispute and any other Dispute, or (iii) any other relationship between the Dispute and the other Dispute(s) which makes it appropriate to do so, then:

(a) If the Arbitral Tribunal for the Dispute and the other Dispute(s) are being appointed at the same time, the Nominated Arbitrators and the Independent Arbitrator shall conform a single Arbitral Tribunal for all the Disputes; and

(b) If the Arbitral Tribunal for the Dispute is being appointed when the Arbitral Tribunal for the other Dispute has already been appointed, the Parties will proceed as stated under section 4.15 in order to determine whether or not the same Arbitral Tribunal shall decide on the new Dispute(s).

4.8 If, in accordance with Clause 4.7, the members of the Arbitral Tribunal are the same persons as arbitrators as already form the Arbitral Tribunal for any other Dispute, the Arbitral Tribunal shall appoint as chairman the person who is acting or acted as chairman on the Arbitral Tribunal in that other Dispute.

4.9 The place and seat of arbitration shall be New York. The Arbitral Tribunal may, however, hold hearings, meetings, or sessions anywhere convenient and as agreed to by all Parties to the arbitration.

4.10 The language of the arbitral proceedings shall be English and Spanish, as appropriate.

4.11 The Parties acknowledge that, for the purposes of the arbitral proceedings, the Arbitral Tribunal will have the original version of the Project Agreements in the language in which they have been executed as binding agreements between the parties. In the event that there is a discrepancy between the original executed version and any translation of such executed version, the original executed version shall prevail.

4.12 The Arbitral Tribunal shall be governed by and shall apply the substantive law governing the Agreement under which the Dispute(s) arise. If the Dispute(s) refers to two (2) or more agreements with different applicable law, the Arbitral Tribunal shall apply the applicable law of the Agreement to the part of the Dispute(s) that refers or relates to each Agreement. The decision of the Arbitral Tribunal shall be final and binding to the fullest extent permitted by law. For the avoidance of doubt, the parties expressly exclude any and all rights to appeal, set aside or otherwise challenge any award by the arbitrators, insofar as such exclusion can be validly made under applicable law or international treaty.

4.13 The Arbitral Tribunal shall neither have nor exercise any power to act as amicable compositeur or ex aequo et bono, or to award special, indirect, consequential or punitive damages.

4.14 In addition to the authority conferred on the Arbitral Tribunal by the ICC Rules, the Arbitral Tribunal shall have the power to grant any provisional measures that it deems appropriate, including but not limited to provisional injunctive relief and/or specific performance, and any provisional measures ordered by the Arbitral Tribunal shall, to the extent permitted by applicable law, be deemed to be a final award on the subject matter of the measures and shall be enforceable as such.

4.15 Subject to Clause 4.17, if an Arbitral Tribunal has been appointed to hear both a Dispute and any other Dispute, at any time either:

(i) before Terms of Reference have been signed or approved in accordance with Articles 18.2 or 18.3 of the ICC Rules (whichever is applicable); or

(ii) after such signature or approval of the Terms of Reference if the Arbitral Tribunal receives the written agreement of all Parties which are parties to the arbitral proceedings of the Dispute (such agreement not to be unreasonably withheld),

the Arbitral Tribunal shall consolidate the arbitral proceedings of the Dispute and the arbitral proceedings of the other Dispute(s) into one set of arbitral proceedings on such procedural conditions as it may determine. The Parties confirm that one of the intentions and purposes of this Agreement is to provide a mechanism for the consolidation and determination of multiple Disputes between multiple Parties pursuant to multiple Project Agreements.

4.16 Subject to Clause 4.17, and whether or not it has been appointed to hear both a Dispute and any other Dispute and whether or not it has consolidated any Disputes pursuant to Clause 4.15, an Arbitral Tribunal shall have the following powers, to be exercised on or with such conditions as it may determine are appropriate in the circumstances:

(i) to direct that any hearings in the arbitral proceedings in relation to the Dispute take place concurrently with the arbitral proceedings of any other Dispute;

(ii) to allow, only upon the application of a Party, one or more third parties to be joined in the arbitral proceedings (and each Party hereby confirms that it consents to being so joined);

(iii) to direct that any documents served or disclosed and any evidence given in the arbitral proceedings of the Dispute be made available to the Parties which are involved in any other arbitral proceedings of any other Dispute; and

(iv) to make such other directions as may be considered by the Arbitral Tribunal to be necessary or expedient to ensure that the Dispute and any other Dispute are resolved justly, efficiently and consistently.

4.17 The Arbitral Tribunal may only exercise such powers in Clauses 4.15 and 4.16 if all parties to the relevant arbitral proceedings have been given a reasonable opportunity to make representations to the Arbitral Tribunal in relation to the exercise of such powers.

4.18 If there is more than one Dispute or more than two Parties are involved in any arbitral proceedings, the Arbitral Tribunal shall have all powers necessary to establish any supplementary procedural rules required or desirable in view of the multi-Dispute and/or multi-Party nature of the arbitral proceedings. Such powers shall include the ability to issue one or more Arbitration Awards during or at the conclusion of the arbitration as considered necessary or appropriate or expedient by the Arbitral Tribunal.

4.19 Each Party which is a party to any arbitral proceedings commenced under this Agreement hereby waives for itself, its assets and its revenues any and all

immunity from jurisdiction, investigation or enforcement that it may enjoy, whether pursuant to international agreements or the domestic laws of any such Party, and further waives any objection to arbitral proceedings being brought in accordance with the terms of this Agreement. If, in any jurisdiction in which arbitral or other proceedings are being taken against a Party, that Party has the power to claim for itself, its assets and its revenues any immunity from service or any immunity from jurisdiction, suit, judgment, execution, attachment or injunction (whether before judgment, in aid of execution or otherwise) or other legal process, including the defenses of "sovereign immunity" or "act of State", or if the court of its own motion grants such immunity to that Party or its assets, such Party hereby irrevocably waives such immunity to the fullest extent permitted by the law of that jurisdiction and consents generally to the giving of any relief or the issue of any process in connection with proceedings to uphold and enforce this Agreement and any Arbitration Award made pursuant to it, including, without limitation, the making, enforcement, or execution against any property whatsoever (irrespective of its use or intended use), of any Arbitration Award or any order or judgment which may be made or given in such proceedings.

4.20 A Party may seek to enforce an Arbitration Award in a court of law in accordance with the terms of this Agreement. The Parties undertake to implement without delay the provisions of any Arbitration Award.

4.21 Unless otherwise decided in the Arbitration Award, any Arbitration Award for the payment of money shall be paid in the currency or respective currencies for payment specified in the applicable Project Agreement or Project Agreements underlying the Dispute or Disputes and with interest accruing from the date of injury until payment, at the rate or respective rates of interest accruing on late payments under the applicable Project Agreement or Project Agreements underlying the Dispute or Disputes.

4.22 The Arbitral Tribunal shall be empowered to award all or a portion of the costs of the arbitration, and arbitration fees, to either Party. Any Party unsuccessfully resisting enforcement of any Arbitration Award must pay the enforcing Party's cost of those proceedings".

2. SEAT OF THE ARBITRATION, LANGUAGE AND APPLICABLE LAW

28. As per Section 4.9 of the DRA and the Parties' agreement[23], the seat of this arbitration is New York City, New York.

29. The language of the arbitration is English and Spanish, as appropriate, pursuant to Section 4.10 of the DRA[24], para. 116 of the Terms of Reference and para. 2 of Procedural Order ["**PO**"] No. 5 – Annex V[25].

[23] Communication sent by King & Spalding to the Secretariat on 30 March 2016; Communication sent by Holland & Knight to the Secretariat on 1 April 2016; Communication of the Secretariat dated 4 April 2016.
[24] JX-007, p. 10; in communications C-14 and R-13, the Parties have confirmed their agreement to have the proceedings conducted in English and Spanish.
[25] TofR, para. 116 states: "The language of the arbitration shall be English and Spanish, as appropriate, pursuant to clause 4.10 of the DRA"; PO No. 1 – Annex V states: "The language of the arbitral proceedings shall be English and Spanish, as appropriate".

30. In accordance with the above provisions, the **Final Award** [also referred to as the "**Award**"] is drafted in English, with a translation into Spanish by a translator of the Tribunal's choosing to follow once the English version of the Final Award is notified to the Parties[26].

31. The law applicable to the dispute will be determined by the Tribunal in section IV *infra*.

3. COMMENCEMENT OF THE ARBITRATION

32. On March 8, 2016 Claimant filed its RfA.

33. On March 25, 2016 the Secretariat was notified by Respondents that the RfA had not been served at the correct address. Upon discussion, the Parties agreed that the formal date of service of the RfA should be March 24, 2016[27]. Accordingly, Respondents were granted until April 25, 2016 to present their answer to the RfA[28].

34. On April 15, 2016 Respondents requested an extension of the term for submitting the Answer to the RfA[29].

35. The Secretariat extended the term until May 25, 2016 and on that date Respondents submitted the Answer to the RfA, with an accompanying counterclaim ["**Answer to RfA and Counterclaim**"][30].

36. On June 27, 2016 Claimant submitted its reply to the counterclaim ["**Claimant's Reply to Counterclaim**"].

4. APPOINTMENT OF ARBITRATORS

37. On June 24, 2016 Claimant appointed Mr. Andrés Jana as co-arbitrator[31]. On that same date Respondents appointed Sir Vivian Ramsey as co-arbitrator[32]. On July 18, 2016, in accordance with Art. 13(2) of the ICC Rules, the Secretary General of the Court confirmed these nominations[33].

38. On August 15, 2016 the co-arbitrators jointly nominated Mr. Juan Fernández-Armesto as president of the Tribunal. On August 19, 2016, in accordance with Art. 13(2) of the ICC Rules, the Secretary General of the Court confirmed Mr. Fernández-Armesto's appointment[34].

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[26] See communications A 172, A 174, A 177-A 180.
[27] Communication sent by Holland & Knight to the Secretariat on March 25, 2016; Communication sent by King & Spalding to the Secretariat on March 30, 2016.
[28] Communication of the Secretariat dated March 30, 2016.
[29] Communication sent by Holland & Knight to the Secretariat on April 15, 2016.
[30] Communication R-4.
[31] Communication of King & Spalding dated June 24, 2016.
[32] Communication of Holland & Knight dated June 24, 2016.
[33] Communication of the Secretariat dated July 18, 2016.
[34] Communication of the Secretariat dated August 19, 2016.

5. TERMS OF REFERENCE, PROCEDURAL ORDER NO. 1 AND PROCEDURAL TIMETABLE

39. On August 31, 2016 the Arbitral Tribunal sent communication A 1 to the Parties, asking them to produce a summary of their positions for the purposes of the Terms of Reference ["**TofR**"][35], which they did on September 16, 2016.

40. On October 4, 2016 the Tribunal issued communication A 4, inviting the Parties to submit their comments on the draft of the TofR. In response to this request, the Parties submitted several observations on October 7, 2016[36].

41. On October 24, 2016, the Parties and the members of the Tribunal held a case management conference call to discuss the procedural measures to be adopted pursuant to Art. 22(2) of the ICC Rules.

42. On October 28, 2016, the Parties and the members of the Tribunal signed the TofR electronically, which was transmitted to the Court at its session of December 15, 2016[37] in accordance with Art. 23(2) of the ICC Rules.

Procedural Order No. 1

43. On that same date, the Tribunal sent a draft PO No. 1 to the Parties and invited them to provide their comments[38], which they did on November 16, 2016[39]. On November 29, 2016 the Tribunal issued PO No. 1 determining the conduct of the proceedings and annexing the Procedural Timetable[40].

44. On April 25, 2017 the Tribunal amended PO No. 1 and issued PO No. 1 *Bis* to accommodate the Parties' agreement to submit certain exhibits jointly [the "**Joint Exhibits**"][41].

45. On September 1, 2017 the Tribunal amended PO No. 1 for a second time and issued PO No. 1 *Ter*[42]. The Parties had jointly requested the Tribunal to extend their deadline for the submission of additional Joint Exhibits due to the volume and complexity of preparing them[43].

46. The Tribunal again amended PO No. 1 on October 18, 2017 when it issued PO No. 1 *Quater*[44]. The Parties had again requested the amendment of PO No. 1 to have more time to prepare the Joint Exhibits[45].

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[35] Communication A 1.
[36] Communications C-13 and R-11.
[37] Letter from the ICC dated December 15, 2016.
[38] Communication A 7.
[39] Communications C-16 and R-16. The Parties brought additional comments in communications C-17, C-18 and R-17.
[40] Letter from the Arbitral Tribunal dated November 29, 2016 transmitting PO No. 1 and annexes.
[41] Communication A 14.
[42] Communication A 21.
[43] Communications C-29 and R-34
[44] Communication A 23.
[45] See Communication R-38.

47. On October 30, 2017 Claimant submitted on behalf of all Parties a set of Joint Exhibits relating to certain contractual agreements between the Parties which the Tribunal acknowledged the day after[46].

48. On November 24, 2021 the Tribunal made a final amendment to PO No. 1 and issued PO No. 1 *Quinquies* incorporating the Parties' agreements on the submission of statements of costs[47].

6. WRITTEN SUBMISSIONS AND DOCUMENT PRODUCTION

A. First Written Submissions

49. On April 28, 2017 Claimant submitted the Non-Exhaustive Statement of Claim[48]. On that same day Respondents filed their Statement of Counterclaim[49].

B. Document Production

50. On June 30, 2017 both Claimant and Respondents submitted their respective Document Production Schedules ["**DPS**"]: Claimant presented 144 requests for document production[50] and Respondents 114 such requests[51].

51. Claimant annotated Respondents' DPS on July 17, 2017[52] and Respondents did the same to Claimant's DPS on July 21, 2017[53]. The DPS exercise was highly contentious and the Parties' arguments, including about the counterparty's cooperativeness, led the Tribunal to convene the Parties to a conference call, which was held on July 18, 2017[54].

52. On August 8, 2017 the Tribunal issued its decisions on Document Production[55].

C. Second Written Submissions

53. On March 16, 2018 the Parties filed their second round of submissions:

- Claimant submitted its Exhaustive Statement of Claim [or "**ESOC**"] and its Non-Exhaustive Defense to the Counterclaim ["**NEDOCC**"];

- Respondents submitted a Non-Exhaustive Defense to the Statement of Claim ["**NESOD**"] as well as an Exhaustive Statement of Counterclaim ["**ESOCC**"].

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[46] See communications A 24 and C-30.
[47] Communication A 168.
[48] Communication C-20.
[49] Communication R-24.
[50] Communication C-25.
[51] Communication R-30.
[52] CB&I's DPS – Annotated by Reficar, dated July 17, 2017.
[53] Reficar's DPS – Annotated by CB&I, dated July 21, 2017.
[54] See communications A 17, A 18 and A 19.
[55] Communication A 20.

D. Third Written Submissions

54. On June 28, 2019 both Parties filed their third round of submissions:

- Claimant submitted its Reply to Respondents' NESOD ["**Reply**"] as well as its Exhaustive Defense to Counterclaim ["**EDOCC**"];

- Respondents submitted their Exhaustive Statement of Defense ["**ESOD**"] as well as a Reply to Claimant's Non-Exhaustive Statement of Defense to Counterclaim [the "**Respondents' Reply on Counterclaim**"].

55. On September 9, 2019 Respondents submitted a communication in which they alleged that Claimant had violated PO No. 1 by improperly presenting new arguments and evidence in its Reply/EDOCC[56].

56. After hearing both Parties[57], the Tribunal decided that:

- Claimant's Reply could contain arguments and evidence which rebut Respondents' NESOD, and that Claimant's Third Written Submissions were *prima facie* compliant with PO No. 1;

- Claimant's Third Written Submissions were *prima facie* responsive to Respondents' Second Written Submissions and needed not be amended;

- Respondents' request that the Parties be ordered to meet and confer to discuss new arguments and all other requests for relief were now moot;

- Both Parties had an exceptional and limited opportunity to submit certain additional arguments or to marshal certain additional evidence, under strict conditions and subject to approval by the Tribunal.

E. Supplemental Submissions

57. On January 10, 2020 the Tribunal granted several requests by the Parties[58] to file additional brief written submissions as well as supplemental witness statements and expert reports[59] after giving the Parties the opportunity to discuss the issue. The Tribunal decided:

- To grant Claimant's request to file a written submission with a length of no more than 25 pages, two supplemental witness statements of no more than 10 pages, excluding attachments and exhibits, and a supplemental expert report from Deloitte with a length of no more than 25 pages excluding attachments and exhibits, by February 1, 2020;

- To grant Respondents an extension to the date for notification of witnesses to be called until February 3, 2020 for those witnesses who had provided further evidence by February 1, 2020.

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[56] Communication R-76.
[57] See communications R-81, C-73 and C-76.
[58] Communication A 85.
[59] Communications A 85, C84, C-88, R-88, and R-92.

58. On October 16, 2020 Claimant submitted a supplemental response to Respondents' Counterclaim ["**Claimant's Supplemental Response to Counterclaim**"].

7. *CONTRALORÍA* PROCEEDING AND POS NO. 2 AND 3

59. Following Respondents' Second Written Submissions, the Tribunal became aware of the existence of an Ordinary Fiscal Liability Proceeding of the Colombian *Contraloría General de la República* [the "***Contraloría***"] against Respondents [the "***Contraloría* Proceeding**"].

60. On March 20, 2018 Claimant submitted a request for the Tribunal's assistance with regard to a document on which Respondents were seeking to rely in their Second Written Submissions, which, according to Claimant, had been inadvertently produced to Respondents during the document production exercise and contained information protected by attorney-client privilege[60].

61. On March 21, 2018 Respondents sent a communication denying that the document was subject to privilege or confidentiality or had been inadvertently produced by Claimant; rather, Respondents stated that it had been sent to them by the Republic of Colombia through the *Contraloría* as evidence supporting the *Contraloría* Proceeding[61].

62. On the same day the Tribunal requested that the Parties attempt to resolve the issue between them[62].

63. On April 26, 2018 Claimant and Respondents jointly advised the Tribunal that they had been unable to reach an agreement on the issue of privilege attaching to the document and requested the opportunity to provide written submissions articulating their respective positions[63].

64. In a separate communication of that same day, Claimant informed the Tribunal that it had notified Respondents of additional objections it had in relation to other documents tendered with Respondents' Second Written Submissions [together, the "**Contested Documents**"]. Claimant additionally requested that the Tribunal issue an interim measure preventing Respondents from disclosing confidential information whilst making submissions on the Contested Documents[64].

65. Respondents immediately replied confirming that they would not reveal the substance of the Contested Documents in their submissions on the matter[65].

66. On April 30, 2018, in light of Respondents' representation, the Tribunal declined to issue interim measures, but directed the Parties to treat the Contested Documents, *pro tem*, as subject to confidentiality and privilege[66].

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[60] Communication C-33.
[61] Communication R-43.
[62] Communication A 34.
[63] Communications C-35 and R-48.
[64] Communication C-36.
[65] Communication R-49.
[66] Communication A 37.

67. On May 14, 2018 the Parties submitted their respective submissions regarding the Contested Documents[67].

68. On the same day, Respondents informed the Tribunal that Claimant had sent a letter to the *Contraloría* notifying it that Respondents had used documents obtained from the *Contraloría* Proceeding in this arbitration, which was subsequently reported in Colombian news[68]. Respondents requested that the Tribunal find Claimant to be in breach of its confidentiality obligation under the DRA[69].

69. On May 30, 2018 Claimant requested that the Tribunal reject Respondents' requests for relief, stating that it was obligated to report Respondents' allegedly wrongful use of confidential information from the *Contraloría* Proceeding under Colombian law[70]. Claimant further argued that as the Contested Documents were obtained through the *Contraloría* Proceeding, they were not covered by the confidentiality clause in Section 8 of the DRA[71].

70. On July 16, 2018 Claimant raised additional objections to 29 documents relied upon by Respondents, which are allegedly confidential and contain material protected by attorney-client privilege[72] [collectively with all documents objected to by Claimant, "**Total Contested Documents**"].

71. On July 23, 2018 Respondents submitted their response, opposing the exclusion of the 29 documents[73].

72. The Parties exchanged several additional submissions addressing Respondents' request and the use of the Total Contested Documents in these proceedings[74].

73. On August 22, 2018 the Tribunal issued PO No. 2, resolving the question of the admissibility of the Total Contested Documents in this arbitration[75]. PO No. 2 established that the Parties were allowed to use the Total Contested Documents in their submissions, on the assumption that the *Contraloría* would promptly release them to the public[76]. The Tribunal also found that Claimant had breached the confidentiality regime of this arbitration, but that no sanctions against Claimant were warranted[77].

74. On September 25, 2018 the Tribunal issued communication A 47, addressing clarifications raised by Claimant regarding certain aspects of PO No. 2.

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[67] Communications C-37 and R-50.
[68] Communication R-51, para. 7, citing Exhibit 1.
[69] Communication R-51, para. 12.
[70] Communication C-38, pp. 3-4.
[71] Communication C-38, p. 4. Claimant states that the confidentiality clause of the DRA does not prevent Claimant from notifying the *Contraloría* about the use of documents that were obtained in the Fiscal Proceeding in this arbitration; further, Section 8.2. of the DRA specifically permits the disclosure of documents in good faith in accordance with the requirements of any applicable laws or any competent authority.
[72] Communication C-41.
[73] Communication R-53.
[74] Communications R-52, C-39, C-40, R-54, C-43, R-56 and C-45.
[75] See PO No. 2, para. 15.
[76] PO No. 2, paras. 155-156.
[77] PO No. 2, para. 164.

75. On November 19, 2018 the Tribunal decided that the deadline for submission of the Third Written Submissions would be delayed until January 31, 2019 to allow for the resolution of the dispute as to the Total Contested Documents[78].

76. On December 19, 2018 the Tribunal issued PO No. 3 resolving the issues related to the Total Contested Documents and the *Contraloría* Proceeding. The Tribunal decided, *inter alia*[79]:

- That documents obtained from the case file of the *Contraloría* Proceeding were admissible in this arbitration and the *reserva* attaching to such documents would be strictly protected by the arbitration's confidentiality regime;

- To authorize the Claimant to have access to the case file of the *Contraloría* Proceeding, obtained by virtue of its participation in a public *acción de tutela* filed against the *Contraloría* by Foster Wheeler USA Corporation and Process Consultants, Inc. ["**Foster Wheeler**"] before the 26th Criminal Circuit Judge in Bogotá;

- To protect the documents subject to attorney-client privilege pursuant to PO No. 2;

- To order the Parties to attempt to come to an agreement on any disputes that may arise regarding other documents that they consider are subject to attorney-client privilege, following the review of the case file of the *Contraloría* Proceeding.

77. On January 4, 2019 the Tribunal addressed a request by Claimant[80] to be granted leave by the Tribunal to submit a *derecho de petición - solicitud de información y copias de documentos de proceso de responsabilidad fiscal* [the "***Solicitud***"] to the *Contraloría* along with excerpts of PO No. 3, to which Respondents objected[81].

78. The Tribunal refused to make an order as a result of the correspondence of the Parties, noting that:

- The Parties were authorized to use documents obtained from the case file of the *Contraloría* Proceeding in the arbitration,

- It considered that the *Solicitud* was unnecessary for the purposes of the arbitration, and

- That it did not consider that Claimant needed to submit the *Solicitud* to use the documents in this confidential arbitration seated in New York.

[78] Communication A 50, p. 5.
[79] PO No. 3.
[80] Communications C-56 and C-57.
[81] Communications R-66 and A 54.

79. On January 17, 2019 the Tribunal granted Claimant's request[82] to provide the *Contraloría* with a copy of the decision portion of PO No. 3 after hearing both Parties on the matter[83].

Update to the *Contraloría* File

80. On January 22, 2021 the Tribunal affirmatively decided on the admissibility of a supplemental submission by CB&I containing documents from the *Contraloría* Proceedings[84] and delivered a clarification of its decision three days later[85].

81. On February 25, 2021 the Tribunal issued an affirmative decision concerning the admissibility of three of the abovementioned files, while at the same time ordering that only an abridged version be introduced into the record[86].

Further documents from the *Contraloría* File

82. On March 26, 2021 the Tribunal issued a decision concerning CB&I's request to present new evidence from the *Contraloría* File[87], comprising 54 email communications, charts and additional materials from the *Contraloría* Proceeding [the "**54 Documents**"] and five "Free Versions". The Tribunal decided to rule on the admissibility of both sets of documents after receiving Reficar's comments[88].

83. On April 15, 2021 the Tribunal admitted the 54 Documents into the case record[89] and permitted Reficar to submit counterevidence in order to protect the equality of arms[90]. On April 27, 2021 the Tribunal admitted into the case file the excerpts of the free version testimony statements provided by the witnesses in the arbitration and to reject the non-witness free version testimony[91].

8. INTERIM MEASURES

A 105

84. On June 29, 2020, in connection with the impending liquidation of CBI Colombiana, Respondents 1 and 2 requested interim measures which would protect their status in the arbitration and which would entitled them to receive notice prior to Reficar contacting the *SDS* (the entity which ordered the liquidation)[92].

85. On July 7, 2020 the Tribunal granted provisional interim measures and ordered[93]:

> "Claimant not to undertake any actions that could lead to the disruption of the *status quo* in the current proceedings (including by undertaking

[82] Communication C-58.
[83] Communication A 57.
[84] Communication A 131.
[85] Communication A 132.
[86] Communications A 136.
[87] Communications A 148.
[88] A 148 paras. 28 and 33.
[89] Communication A 151, para. 27.
[90] A 151, para. 30.
[91] Communication A 154, para. 36.
[92] Communication R-110.
[93] Communication A 96.

> communication and/or coordination with the [*SDS*]), without giving reasonable prior notice to the Tribunal and Respondents".

86. The following day Claimant asked for a confirmation that the provisional interim measures did not affect its information duties vis-à-vis the *SDS* on matters which are not related to the arbitration[94]; the Tribunal provided such confirmation on the next day[95].

87. On August 4, 2020 Respondents 1 and 2 reiterated their request for interim measures[96].

88. On July 24, 2020 Claimant objected to Respondents' request for interim measures[97]; however, on August 11, 2020 Claimant agreed that a narrowed version of the interim measures could be ordered by the Tribunal[98].

89. On September 2, 2020 the Tribunal and the Parties held a conference call in which the situation of CBI Colombiana, as well as the interim measures requested by Respondents 1 and 2, were discussed[99].

90. On September 7, 2020 the Tribunal made its decision, ordering the replacement of the provisional interim measures with the following interim measures ["**Communication Interim Measures**"], taking effect immediately[100]:

> "The Tribunal instructs Claimant not to communicate or coordinate with the [*SDS*] or the liquidator of CBI Colombiana (or with members of his team), in relation to the liquidation of CBI Colombiana or the present arbitration proceedings, without giving reasonable prior notice to the Tribunal and Respondents".

91. On September 30, 2020 the Tribunal and the Parties held another conference call in which the Communication Interim Measures were further discussed[101].

92. On November 30, 2020 the Tribunal partially lifted the Communication Interim Measures from the date of dispatch of the letter to the Liquidator, which would confirm CBI Colombiana's participation in this arbitration[102].

93. On January 21, 2021 the Tribunal clarified its decision A 123 and specified that the lifting of the Communication Interim Measures only applied to Claimant's communications with the Liquidator[103]. Thus, the Communication Interim Measures were modified as follows[104]:

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[94] Communication C-120.
[95] Communication A 101.
[96] Communication R-115.
[97] Communication C-117.
[98] Communication C-122.
[99] Communications A 103 and A 104.
[100] Communication A 105, pp. 4-5.
[101] Communication A 107.
[102] Communication A 123.
[103] Communication A 130, para. 82.
[104] Communication A 130, para. 83.

> "The Tribunal instructs Claimant not to communicate or coordinate with the Superintendencia de Sociedades in relation to the present arbitration proceedings without giving reasonable prior notice to the Tribunal and Respondents".

PO No. 4

94. On November 27, 2019, Claimant filed a Request for Emergency Conservatory and Interim Measures[105] ["**Claimant's Request for Interim Measures**"] requesting certain interim measures to protect the alleged harm that could result from Respondents' difficult financial situation[106]; Respondents submitted an opposing statement on December 16, 2019[107] ["**Respondents' Opposition to Claimant's Request for Interim Measures**"].

95. On January 22, 2020 the Tribunal issued PO No. 4:

- Ordering Respondents to notify the Tribunal and Claimant in advance of any either significant corporate restructuring or alienation, transfer or sale of assets over the value of a certain threshold, but

- Denying Claimant's requests to order Respondents to provide security and to maintain the *status quo* and to order Respondents to refrain from taking any measures that would aggravate the Parties' dispute as well as any other requests for relief[108].

96. On March 22, 2021 the Tribunal issued a communication clarifying that PO No. 4 remained valid and binding upon the Parties and determining that the threshold for disclosure under PO No. 4, which had not been articulated in the first place, should be 5% of McDermott's assets[109].

9. HEARING PREPARATIONS AND SUBMISSION OF NEW *CONTRALORÍA* EVIDENCE

97. On March 1, 2021 Respondents submitted a communication to the Tribunal seeking leave to introduce three requests for dispositive pre-hearing relief[110] to which Claimant objected[111]. The Tribunal decided on the issue on April 1, 2021[112], denying CB&I the requested leave.

98. On March 1, 2021 the Tribunal issued a decision regarding seven disputed instances concerning the text of the draft protocol for the Hearing ["**DHP**"][113] which had been proposed jointly by the Parties[114].

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[105] Communication C-90.
[106] Ex. C-1865, pp. 87, 89-99.
[107] Communication R-98.
[108] PO No. 4, para. 74.
[109] Communication A 146.
[110] Communication R-165.
[111] Communication C-174.
[112] Communication A 149.
[113] Communications C-164 and R-163.
[114] Communication A 138.

99. On March 12, 2021 Claimant submitted an update regarding the amounts it claims in the arbitration[115].

100. On March 18, 2021 the Tribunal ordered a cut-off date of April 5, 2021 (six weeks before the scheduled Hearing) for the Parties to present any new procedural submissions of any type[116].

101. On March 22, 2021 the Tribunal circulated a communication to the Parties[117] containing the finalized Hearing Protocol ["**HP**"] reflecting the changes proposed by the Parties[118]. On the same day, the Parties informed the Tribunal that they had agreed on a set of principles for the organization of the second block of the Hearing as foreseen under paras. 81 and 82 of the HP[119].

102. In its communication A 150, issued on April 12, 2021 the Tribunal ruled on two requests submitted by the Parties:

- CBI's request to submit a video of the Refinery called "*Experiencia 360 – Refinería de Cartagena*"[120]: the Tribunal decided that this video was not necessary in light of the upcoming virtual Site Visit, but that CB&I could approach the Tribunal again if it felt that the video contained essential footage that had not been accessible during the virtual Site Visit.

- CBI's request for an order that the witnesses who provided their witness statements in the arbitration in English must also testify in English (rather than in Spanish, irrespective of their preferences) at the Hearing[121], which the Tribunal denied[122].

103. On April 30, 2021 each Party filed a submission with a summary of its respective case in preparation of the Hearing [the "**Hearing Summary Submission**"].

10. HEARING AND SITE VISIT

104. Originally, the Hearing had been scheduled for one month between October 15, 2018 and November 15, 2018[123].

105. Due to several delays in the procedural calendar (originated in part by the document production), on April 18, 2018 the Parties suggested a new timetable for the Hearing. Therefore, the Hearing was postponed to April 15, 2019 to May 10, 2019[124] and the Site Visit was set for March 19 and 20, 2019.

106. In 2019 the scheduled period for the Hearing was shifted once more due to the volume and complexity of the arbitration proceeding. After negotiations and with

[115] Claimant's Updated Statement of Claim Amounts.
[116] Communication A 144.
[117] Communication A 145.
[118] Communications C-173 and R-170.
[119] Communications C-183 and R-179.
[120] Communication R-186.
[121] Communication R-187.
[122] Communication A 150.
[123] PO No. 1, Annex 1.
[124] See communications A 36, C-34 and R-45.

the agreement of the Parties, the Tribunal issued Annex I *Sexies* to PO No. 1 *Quater*, determining a split Hearing period from April 20 to May 1, 2020 [the "**First Block**"] and from May 12 to May 22, 2020 [the "**Second Block**"][125]. However, the Parties could not agree on whether additional hearing time would be needed, so the Tribunal reserved June 8 to June 19, 2020 *pro tem* and uttered that it would finally decide on whether to use additional hearing time at a later stage[126]. With the same amendment the scheduled Site Visit was shifted to December 9 and 10, 2019.

107. On November 25, 2019 the Tribunal sent a communication addressing the Parties' disagreement as to the appropriate length of the Hearing, deciding that four weeks would be sufficient time for the Parties to properly present their case at the Hearing[127].

108. On December 2, 2019 the Tribunal was forced to cancel the Site Visit due to an unexpected medical emergency affecting one of its members[128]. On December 4, 2019 the Tribunal, after consulting the Parties, decided to hold the Site Visit on June 9, 2020[129].

109. In early 2020 the COVID-19 pandemic hit the world and also affected the conduct of the arbitration, rendering an in-person Hearing in April/May 2020 unviable. On September 7, 2020 the Tribunal decided to hold the First Block virtually by videoconference.

110. On February 1, 2021 the Tribunal ordered a virtual Hearing in two Blocks in May-June and June-July 2021 and decided that the Site Visit would be held virtually at the beginning of the Hearing dates[130].

111. On April 29, 2021 the pre-Hearing conference was held virtually. Apart from general matters concerning the Hearing, the participants discussed Reficar's motion to cancel the Virtual Site Visit[131].

112. On May 1, 2021 weighing the high informational value of the Virtual Site Visit against the health hazards associated with recording it, the Tribunal decided for the Virtual Site Visit to proceed, but with the maximum precautions possible[132].

113. The Hearing was held virtually in the two Blocks. The First Block started on May 17, 2021 and ended one day earlier than envisaged on June 4, 2021 and the Second Block started on June 28, 2021 and ended on July 16, 2021.

11. POST-HEARING PERIOD

[125] See communication A 67.
[126] See communication A 65.
[127] Communication A 78.
[128] Communication A 81.
[129] Communication A 82.
[130] Communication A 133.
[131] Communication A 155.
[132] Communication A 156.

114. On July 19, 2021 the Tribunal updated the Procedural Timetable to include the procedural steps that had to be taken after the Hearing[133]. The Tribunal prepared a list of questions for the Parties and circulated this list on July 30, 2021[134].

115. On October 22, 2021 the Parties submitted their first post-Hearing briefs ["**CPHB**" and "**RPHB**"].

116. On November 10, 2021 the Parties submitted their second post-Hearing submissions ["**CPHB2**" and "**RPHB2**"].

117. On November 16, 2021 the Tribunal circulated a communication in which it confirmed and enumerated the general principles governing the sessions of closing oral arguments [the "**Oral Closings**"][135].

118. The Oral Closings were held virtually on November 18 and 19, 2021; the first day was dedicated to the Parties' closing presentations and the second day to a discussion on the submission of statements of costs by the Parties[136].

119. At the end of the Hearing Mr. Stenglein, Counsel for Claimant and Mr. Holt, Counsel for Respondents, both confirmed that there were no due process issues which they would like to raise[137].

120. On November 24, 2021 the Tribunal issued a communication to memorialize the agreements that had been reached during the Oral Closings among all participants[138]. Among other things, the Tribunal set deadlines for the Parties to submit their **Statements of Costs** and outlined how the Statements of Costs should be structured.

121. Claimant sent its Statement of Costs to the Tribunal on December 20, 2021, whereas Respondents 1 and 2 did so on February 11, 2022[139]. The Tribunal circulated the Parties' Statements of Costs to the counterparty on the following day[140].

12. SUMMARY OF THE SUBMISSIONS AND EVIDENCE

122. The Parties have filed the following main substantive submissions:

Party(/ies)	Submission	Date
Claimant	Request for Arbitration	March 8, 2016
	Claimant's Reply to Counterclaim	June 27, 2016
	Non-Exhaustive Statement of Claim	April 28, 2017

[133] PO No. 1 *Quater* – Annex I *Decies*.
[134] Communication A 164.
[135] Communication A 166.
[136] See PO No. 1 *Quater* – Annex I *Decies* and PO No. 1 *Quater* – Annex I *Undecies*.
[137] See Tr. 7238:25–7239:13.
[138] Communication A 168.
[139] See Exhs. C-0232 and R-0077.
[140] Communication A 169.

	Exhaustive Statement of Claim	March 16, 2018
	Non-Exhaustive Defense to Counterclaim	March 16, 2018
	Reply to Respondents' Non-Exhaustive Statement of Defense	June 28, 2019
	Exhaustive Defense to Counterclaim	June 28, 2019
	Request for Emergency Conservatory and Interim Measures	November 27, 2019
	Supplemental Response to Respondents' Counterclaims	October 16, 2020
	Updated Statement of Claim Amounts	March 12, 2021
	Claimant's Hearing Summary Submission	April 30, 2021
	First Post-Hearing Brief	October 22, 2021
	Second Post-Hearing Brief	November 10, 2021
	Claimant's Statement of Costs	December 20, 2021 (updated on February 22, 2022)
Respondents	Answer to RfA and Counterclaim	May 25, 2016
	Statement of Counterclaim	April 27, 2017
	Exhaustive Statement of Counterclaim	March 16, 2018
	Non-Exhaustive Statement of Defense	March 16, 2018
	Reply to the Non-Exhaustive Statement of Defense to Counterclaim	June 28, 2019
	Exhaustive Statement of Defense	June 28, 2019
	Opposition to Claimant's Request for Emergency Conservatory and Interim Measures	December 16, 2019
	Respondents' Hearing Summary Submission	April 30, 2021
	First Post-Hearing Brief	October 22, 2021
	Second Post-Hearing Brief	November 10, 2021
	Respondents 1 and 2's Statement of Costs	February 12, 2022

123. The Parties have jointly marshalled over 6000 numbered factual exhibits (a number of which are collective exhibits with hundreds of individual documents) and over 1500 legal exhibits into the record:

Party	Factual exhibits	Legal authorities	Joint Exhibits
Claimant	C-0001 through C-1959	CL-0001 through CL-0895	JX-001 – JX 460, Joint Counterclaim Table, presented with Communication C-226/R-212
Respondents	R-0001 through R-4145	RL-0001 through RL-0807	

124. The Parties have also submitted chronologies of facts[141] and an agreed chronological index of exhibits[142].

125. There are multiple factual exhibits that are repeated on the record, brought by different Parties and sometimes even by the same Party multiple times. The fact that the Tribunal refers to a single exhibit does not imply that the Tribunal has failed to review all the versions of the exhibit brought into the record.

126. The Parties have jointly relied on the testimony of dozens of fact witnesses, who have signed a total of over a hundred witness statements:

Claimant	Position
Javier Iván Alfonso García	Lawyer, specialized in labour law, employee of Reficar (post-2010)
Ramiro Arenas	Electronics Engineer, Instrument Control Engineer (2008-2014), Engineering Director (2014-Dec. 2015), Management, Control and Support Director (Dec. 2015-2017), employee of Reficar
Carlos Avellaneda	Head of the Technical Office in the JCS Consortium (May-Aug. 2012), Central Control Building of the Cartagena Refinery Construction Project Manager (Aug. 2012-2014)
Roberto Benavides	Chemical Engineer, employee of Reficar, Construction Superintendent Water Treatment and Sulfur Units (2012-2014), PCS Director (2015-2016)
Ernie Breaux	Former CB&I Employee, HSE Operations Manager (2010-2011 and 2013-2015)
Carlos Bustillo Lacayo	Technical Representative of Ecopetrol (Technical Manager/Technical Superintendent) (Oct 2006-2009), Former Vice-President of the Project to Expand the Cartagena Refinery (July 2009-July 2012), Advisor to Reficar Vice-President (Jul. 2012-Nov. 2013), Technical Project Manager for Massy (Oct. 2014)
Felipe Castilla Canales	Former Vice President of Finance and Administration, Reficar (Dec. 2007-Apr. 2009, Oct. 2009-Feb. 2012), Acting President of Reficar (Jun.-Sep. 2009)
Medardo Chinchilla	Procurement Professional, employee of Ecopetrol, later Reficar
Don Dilley	Material Manager (2008-late 2009), PMC Pipe Fabrication Material Manager (beginning 2010), former employee of Foster Wheeler
Belinda Fuentes	Project Manager for the Reficar project, former employee of Petrotiger (2010-2012)
John Gilchrist Bustamante	Chemical Engineer, Deputy Project Director for the expansion of the Cartagena Refinery (Mar. 2010-Jun. 2013), employee of Reficar
Nicolás González	Mechanical Engineer, Leader of the Invoicing Review Team, employee of Reficar

[141] Claimant's Chronology dated March 20, 2017.
[142] See Joint Communication C-211 & R-201.

Javier Gutiérrez Pemberthy	Former President of Ecopetrol and former Member of the Board of Directors of Reficar, 2007-2015
Bryan Hartman	Senior Subcontracts Manager (Jan. 2014-Mar. 2017), Foster Wheeler
Carlos Herrera	Business Manager, Foster Wheeler
Ernest Houtz	Vice President & Project Director (2005-2009) and Technical Consultant (2009-2015), Glencore, later Reficar
Rafael León Gómez	Planning Analyst and Supply Chain Integral Performance Project Manager at Ecopetrol (2011-2015), Planning Manager and Operational Performance Manager at Reficar (since 2015)
Luis Malaver	Former Manager of the Internal Audit Department, Reficar (Oct. 2009-Aug. 2013)
Christian Mantilla	Civil Engineer, Project Controls Director of the FPJVC Team (Nov. 2009-Aug. 2015), Project Director (after Aug. 2015), employee of Foster Wheeler
Walter Marín	Independent Businessman with various companies specialized in electrical installations, industrial instrumentation and automatization and oversight, Project Director for CB&I for the BGC3 Contract (beginning Nov. 2013)
José Marrugo Roa	Economist and Business Administrator, Labour Relations Coordinator (2012) and Administrative Vice President (Sep. 2013-Dec. 2016), Reficar
Jon Moore	Former Procurement Director for the Reficar Project (beginning Mar. 2013) at Foster Wheeler
Alfonso Núñez Nieto	Director of Industrial Safety, Environmental and Occupational Health, and Process Safety (2009-2013), Construction Director Block A (Dec. 2013-2014), Director of Preparation and Commissioning of Industrial Service Unit Tanks (2014-Sep. 2015), Reficar
Jairo Peláez	Construction Director for the Reficar Project (Oct. 2014-Nov. 2015), Massy
Rafael Pittaluga	Mechanical Engineer, Director of Management Control and Support, Reficar (Oct. 2013-Nov. 2015)
Andrés Riera	Chemical Engineer, former Vice-President of the Project to Modernize and Expand Reficar (2012-2015), former Vice President for PCS (2015-2016) former Technical Manager (2016-2017) and Refining Advisor, Reficar, later Ecopetrol
Jorge Rodas	Costs Manager (2011-2018), Reficar
Roberto Romero	Finance Administrator Compliance for the Reficar Project (Oct. 2012-2014), Team Leader Offshore Invoice Review Team (2014-2017), Team Leader Onshore and Offshore Invoice Review Team (beginning July 2017), employee of Foster Wheeler
Paul Ruwe	Chemical Engineer, Group Manager, Jacobs Consultancy (beginning 2012)
Julio César Suárez	Civil Engineer, Deputy Manager of the Refinery Expansion Project (Oct. 2011-May 2012), Greenfield Construction Director (May 2012-Jan. 2015) Project Director for the Refinery Expansion Project (beginning Jan. 2015), Reficar
Enrique Torres	Chemical Engineer, former Engineering Director for the Refinery Expansion Project (2009-2014), Reficar
Sonia Urbina	Former Treasurer (2008-2012), former Senior Cost Control Professional (2012-2014) Senior Management Professional (beginning 2014), Reficar

Respondents	Position
Terry Anderson Baker	Project Material Manager & Materials Management Lead (2010-2012, 2013-2015), Expediting Lead (Feb. 2012), CB&I
Allen Barbre	Electrical Engineer, former Director of Engineering, Deputy Project Director for the Reficar Project and Manager of Project Engineering, CB&I
Robert J. Bridges	Former Construction Manager and Director of Construction for the Reficar Project (2010-2015), CB&I
Abel Campos	Project Security Manager (2009), CB&I
Cesar Canals	Global Vice President Business Development for Central, South America and the Caribbean (2006-2009), Product Executive for CB&I Storage Tank Solutions, CB&I
Philip Chapman	Former Lead Construction Coordinator Manager for the Reficar Project (March 2011), CB&I
Gary Davison	Project Engineering Manager (2009-Jun. 2010), CB&I
Masoud Deidehban	Former Project Director for the Reficar Project for CB&I UK and CBI Colombiana (Jan. 2009-Oct. 2015)
Kris Gachassin	Estimating Manager (2008-2010), CB&I
Steve J. Hartley	Construction Quality Manager (2008-2012), Project Quality Manager (2012-2015), CB&I
Stephen J. Kent	Commissioning and Completions Manager, CB&I (Oct. 2010-Sep. 2015)
Guillermo Lozada	Project Manager for the FCC Unit of the Reficar Project (2009-Jul. 2016), CB&I
Robert Matis	Former Project Finance Director for CB&I UK and CBI Colombiana for the Reficar Project (2012-Oct. 2015)
Todd Minnich	Civil Engineer and Economist, PMCS and Progress Lead & Quantity Surveying and Progress Reporting Lead (Sep. 2012-2015), CB&I
Francisco Ordonez	Planning and Scheduling Manager and Project Controls Director (Dec. 2013-early 2015), Project Controls Director (Early 2015-Jul. 2021), CB&I
Daniel G. Reeves	Subcontracts Manager for the Reficar Project, CB&I
Ernest Richardson	Subcontracts Director for the Reficar Project (2008-2014), CB&I
William Smith	Former Buyer and Project Procurement Manager for the Reficar Project, CB&I
Michelle L. Tipton	Former Purchasing Lead for the Reficar Project (2007-2012), CB&I
Antonio S. Yibirin	Former Project Controls – Cost Control Lead for the Reficar Project (May 2008-Sep. 2012), CB&I
Phillip Larsen	Former Senior Unit Manager for Unit 002 and former Senior Construction Manager for Block A in the Reficar Project (early 2010-Oct. 2013), CB&I
Daniel Ebeling	Former Completions Superintendent in Reficar's PCS Group (Feb. 2012-Oct. 2015), Foster Wheeler
Jann K. Elkins	Project Engineering Manage, supervising Inelectra (Dec. 2009), CB&I
Alfred Jones	Former Completions Area Superintendent for the Reficar Project (Apr. 2011), Foster Wheeler

127. The Parties have jointly presented nearly 30 expert reports prepared by the following expert witnesses[143]:

Claimant	**Issue**
Peter P. Bartlett, Charles J. Hirst, Alan W. Reynolds, Timothy D. Rooney (Baker & O'Brien)	Technical Issues
Joseph J. Egan	Lost Profits and Cost of Capital
W. Tom Thweatt, Stephen P. Warhoe, Robert J. Lane (Long International)	Management Issues, Delay and Cost Increases
Arturo Solarte Rodríguez	Colombian Law
José Roberto Herrera Vergara	Colombian Labour Law
Camilo Calderón Rivera	Fiscal Responsibility
J. Paul Campbell, Michael Hostettler, Steven Scott (Deloitte)	Invoices (Counterclaim)
Respondents	**Issue**
Jaime Alberto Arrubla-Paucar	Colombian Law
Carlos Ernesto Molina Monsalve	Colombian Labour Law
Donald Harvey	Delay and Productivity
C. David Millican, Nicholas D. Adams (WMC)	Engineering and Project Management
Christopher Hillier	Project and Construction Management
Scott D. Gray	Damages
Wiley R. Wright	Accounting and Invoicing
Mark Hackett	Quantum
Manuel A. Abdala	Quantum

128. In addition, the following 11 Joint Expert Reports (some accompanied by voluminous addenda in Excel format) have been submitted by the Parties:

Issue	**Experts**
Pre-Contract Issues	Baker & O'Brien (Reficar) Watson Millican (CB&I)
Engineering	Baker & O'Brien (Reficar) Watson Millican (CB&I)
Procurement	Baker & O'Brien (Reficar) Watson Millican (CB&I)
Construction	Long International (Reficar) GT Fairway (CB&I)
Delay/Schedule Analysis	Long International (Reficar) Secreteriat (CB&I)

[143] The expert witnesses of both sides have also submitted appendices, attachments and exhibits to their reports, but they will not all be listed for reasons of procedural efficiency.

Quantum of Reficar's Claim	Long International (Reficar) Ankura (CB&I)
Lost Profits	Breakwater (Reficar) Compass Lexecon (CB&I)
Colombian General Law	Solarte (Reficar) Arrubla (CB&I)
Colombian Labour Law	Herrera (Reficar) Molina (CB&I)
Counterclaim Quantum	Deloitte (Reficar) Wright (CB&I)/Hackett (CB&I)
Colombian Fiscal Liability Law	Calderón (Reficar) Arrubla (CB&I)

129. The following Hearing Transcripts are on record:

TR. Pages	**Day/Vol.**	**Date**	**Activities/Witness(es)**
1 - 84[144]	1	May 17, 2021	Virtual Site Visit
86 - 412	2	May 18, 2021	*Reficar's Opening Statement*
414 - 710	3	May 19, 2021	*CB&I's Opening Statement*
712 - 999	4	May 20, 2021	Masoud Deidehban
1001 - 1269	5	May 21, 2021	Masoud Deidehban
1271 - 1505	6	May 22, 2021	Masoud Deidehban
1507 - 1731	7	May 25, 2021	Ernie Houtz
1733 - 1928	8	May 26, 2021	Julio César Suárez Alfonso Nunez
1930 - 2162	9	May 27, 2021	Alfonso Núñez Nieto Carlos Herrera Jorge Rodas
2164 - 2425	10	May 28, 2021	Sonia Urbina Roberto Benavides John Gilchrist
2427 - 2626	11	May 29, 2021	Enrique Torres Carlos Bustillo
2628 - 2891	12	June 1, 2021	Kris Gachassin Gary Davison
2893 - 3137	13	June 2, 2021	Abel Campos Phillip Larsen
3139 - 3409	14	June 3, 2021	Philip Chapman Francisco Ordonez
3411 - 3619	15	June 4, 2021	Antonio S. Yibirin Terry Anderson Baker
3621 - 3850	16	June 28, 2021	*Second Block Opening Statement by Reficar* *Second Block Opening Statement by CB&I* Expert Discipline: Colombian Civil & Commercial Law Arturo Solarte for Reficar
3852 - 4040	17	June 29, 2021	Jaime Arrubla for CB&I Joint Examination on Colombian Civil & Commercial Law Issues

[144] The Tribunal notes that the page numbers do not exactly match – this is due to the transcripts for each day being followed by a varying number of pages with a glossary of terms and their appearance in the text.

4042 - 4282	18	June 30, 2021	Expert Discipline: Cost & Claim Quantum Robert Lane for Reficar Scott Gray, Mark Hackett, & Wiley Wright for CB&I
4284 - 4539	19	July 1, 2021	Scott Gray, Mark Hackett, & Wiley Wright for CB&I Joint Examination on Cost & Claim Quantum Issues
4541 - 4786	20	July 2, 2021	Expert Discipline: Schedule & Delay Stephen Warhoe for Reficar
4788 - 5007	21	July 3, 2021	Donald Harvey for CB&I Joint Examination on Schedule & Delay Issues
5009 - 5228	22	July 6, 2021	Expert Discipline: Project Design / Definition & Engineering Alan Reynolds, Peter Bartlett & Tim Rooney for Reficar
5230 - 5490	23	July 7, 2021	David Millican & Nick Adams for CB&I Joint Examination on Project Design / Definition & Engineering Issues
5492 - 5694	24	July 8, 2021	Expert Discipline: Procurement Tim Rooney for Reficar David Millican for CB&I
5696 - 5893	25	July 9, 2021	Joint Examination on Procurement Issues Expert Discipline: Construction Ted Brown for Reficar
5895 - 6073	26	July 10, 2021	Chris Hillier for CB&I Joint Examination on Construction Issues
6075 - 6225	27	July 12, 2021	Expert Discipline: Colombian Labour Law Jose Herrera for Reficar Carlos Molina for CB&I Joint Examination on Colombian Labour Law Issues
6227 - 6356	28	July 13, 2021	Expert Discipline: Colombian Fiscal Responsibility Law Camilo Calderon for Reficar Jaime Arrubla for CB&I Joint Examination on Colombian Fiscal Responsibility Law Issues
6358 - 6612	29	July 14, 2021	Expert Discipline: Counterclaim Quantum Wiley Wright & Mark Hackett for CB&I Michael Hostettler, J. Paul Campbell, Steven Scott for Reficar Joint Examination on Counterclaim Quantum Issues
6614 - 6797	30	July 15, 2021	Expert Discipline: Lost Profits Joseph Egan for Reficar Manuel Abdala for CB&I
6799 - 6932	31	July 16, 2021	Joint Examination on Lost Profits Issues
6967-7201	32	November 18, 2021	Oral Closings Session, Day 1
7206-7241	33	November 19, 2021	Oral Closings Session, Day 2

130. The following Hearing Exhibits were presented:

H-1	Reficar Opening Presentation
H-2	CB&I Opening Presentation

H-3	Reficar's Counsel's Handwritten Calculations from M. Deidehban Examination
H-4	Reficar's Counsel's Handwritten Calculations from M. Deidehban Examination
H-5	Reficar's Counsel's Handwritten Calculations from M. Deidehban Examination
H-6	Reficar's Counsel's Handwritten Calculations from M. Deidehban Examination
H-7	Reficar's Counsel's Handwritten Calculations from M. Deidehban Examination
H-8	[INTENTIONALLY OMITTED]
H-9	Reficar's Counsel's Handwritten List from M. Deidehban Examination
H-10	Virtual Site Visit (Video 1)
H-11	Virtual Site Visit (Video 2)
H-12	Summary of Pre-Recorded Virtual Site Visit (Final Guide to Videos), dated May 17, 2021
H-13	Reficar's Compilation of CB&I Monthly Report Data
H-14	Reficar's Compilation of Photographs and Diagrams of the Project in the Record
H-15	Reficar's Demonstrative Exhibit CD-002
H-16	English Translation of Ex. R-1758 (p.21)
H-17	Reficar's Counsel's Handwritten Diagram
H-18	Reficar Second Block Opening Presentation
H-19	CB&I Second Block Opening Presentation
H-20	Reficar's Expert Presentation on Colombian Civil Law
H-21	CB&I's Expert Presentation on Colombian Civil Law
H-22	Reficar Quantum Expert Presentation
H-23	CB&I's Expert Presentation on Claim Quantum
H-24	Reficar's Expert Presentation on Scheduling and Delay Analysis
H-25	CB&I's Expert Presentation on Scheduling and Delay Analysis
H-26	Reficar's Expert Presentation on Project Design and Definition & Engineering
H-27	CB&I's Expert Presentation on Project Design and Definition & Engineering
H-28	Reficar's Expert Presentation on Procurement
H-29	CB&I's Expert Presentation on Procurement
H-30	Reficar's Expert Presentation on Construction
H-31	CB&I's Expert Presentation on Construction
H-32	Reficar's Expert Presentation on Colombian Labor Law
H-33	CB&I's Expert Presentation on Colombian Labor Law
H-34	Reficar's Fiscal Liability Law Expert Presentation
H-35	CB&I's Fiscal Liability Law Expert Presentation
H-36	CB&I Counterclaim Expert Presentation
H-37	Reficar's Counterclaim Expert Presentation
H-38	Reficar's Expert Presentation on Lost Profits Damages
H-39	CB&I's Expert Presentation on Lost Profits Damages
H-40	Excerpt from KEATING ON CONSTRUCTION, 9th Edition
H-41	Claimant's Closing Presentation
H-42	Respondents' Closing Presentation

131. For ease of reference, the Tribunal notes that CB&I has referred to the following individually-marked exhibits from the *Contraloría* casefile[145]:

R-1853_0002	Project Cost Risk Analysis Presentation, Attachment 11 to Reficar Board Meeting Minutes No. 029, dated 24 Nov 2008
R-1853_0004	Reficar Comité de Costos Meeting Minutes No. 04, dated 26 Oct 2011
R-1853_0005	Reficar Cost Control Memorandum
R-1853_0026	Transcript of Testimony before Procuraduría of J. Rodas, dated 10 May 2016
R-1853_0029	Reficar Comité de Costos Meeting Minutes No. 07, dated 27 Jan 2012

[145] The *Contraloría* casefile is a voluminous folder; CB&I has referred to certain documents identified in that folder using the numbers listed by the Tribunal.

R-1853_0032	Reficar Board Meeting Minutes No. 107, dated 1 Mar 2013
R-1853_0036	Precommissioning Plan Presentation, Attachment 8 to Reficar Board Meeting Minutes No. 139, dated 14 May 2014
R-1853_0037	Project Management Presentation, Attachment 3 to Reficar Board Meeting Minutes No. 70, dated 20 Jun 2011
R-1853_0038	Email from C. Mantilla to N. Isaksson and others, dated 27 Nov 2012
R-1853_0039	Fiscal Liability Proceeding Before Contraloría General de la República, Process No. PRF-2017-00309_UCC-PRF-005-2017, Free Version Rendered by Christian Mantilla, Verbal, dated 7 Nov 2017
R-1853_0040	Monetary Recovery Presentation, Attachment 7 to Reficar Board Meeting Minutes No. 121, dated 11 Sept 2013
R-1853_0048	Foster Wheeler Minutes of Meeting, dated 28 Jul 2010
R-1853_0049	Email from C. Mantilla to R. Bramwell and others, dated 5 Apr 2013
R-1853_0050	Fiscal Liability Proceeding Before Contraloría General de la República, Process No. PRF-2017-00309_UCC-PRF-005-2017, Free Version Rendered by Christian Mantilla, dated 8 Feb 2018

13. ADVANCE ON COSTS

132. The Court initially fixed the advance on costs at USD 650,000[146]. On July 5, 2018 the Court readjusted and increased the advance on costs to USD 2,055,000[147].

133. On April 29, 2021 the Court readjusted the advance on costs and increased in to USD 3,850,000[148].

134. Finally, on January 25, 2022 the Court increased the advance on costs to USD 5,400,000[149].

135. The Parties have contributed to the advance on costs in the following amounts[150]:

Party	Amount paid
Claimant	USD 3,402,500
Respondents	USD 1,997,500
Total	**USD 5,400,000**

136. Any amounts remaining in the case finances shall be reimbursed to the Parties pursuant to the Court's decision of May 5, 2023[151].

14. TIME PERIOD FOR THE ISSUANCE OF THE AWARD AND CLOSING OF THE PROCEEDINGS

137. Originally, the ICC Court had fixed February 28, 2019 as the time limit for the Final Award[152]. The Court amended the deadline for rendering the Final Award on multiple occasions, on:

- February 7, 2019, extended until August 31, 2020;

[146] Financial table of September 21, 2016.
[147] Secretariat's letter and Financial table of July 12, 2018.
[148] ICC communication of April 29, 2021.
[149] ICC communication of January 25, 2022.
[150] Financial table of May 5, 2023.
[151] Financial table of May 5, 2023.
[152] ICC communication of March 2, 2017.

- August 6, 2020, extended until December 30, 2020;
- December 3, 2020, extended until August 31, 2021;
- August 5, 2021, extended until October 29, 2021;
- October 7, 2021, extended until February 28, 2022;
- April 7, 2022, extended until November 30, 2022;
- November 3, 2022, extended until March 31, 2023;
- March 2, 2023, extended until May 31, 2023; and
- May 4, 2023, extended until August 31, 2023.

138. Therefore, this Final Award is rendered within the granted time limit.

139. On March 24, 2023, pursuant to pursuant to Art. 27 of the ICC Rules, the Tribunal declared the proceedings closed with respect to the matters to be decided in the Final Award.

140. On March 31, 2023 the Arbitral Tribunal submitted the draft Final Award to the Court, pursuant to Art. 33 of the ICC Rules. On May 5, 2023 the Court approved the draft Final Award[153].

[153] Communication from the ICC Secretariat dated May 5, 2023.

III. INTRODUCTION AND PENDING PROCEDURAL MATTERS

1. OVERVIEW

141. The dispute before the Tribunal arises out of one of the biggest industrial projects in Latin America. The following paragraphs aim at providing a brief and simplified summary of the dispute, which should not be interpreted as a precise and exhaustive factual recollection.

142. Reficar owned an old refinery in Colombia and decided that it was time it underwent major improvements and modernisation. CB&I was the contractor in charge of the engineering, procurement and construction ["**EPC**"] project.

143. There is no dispute that the performance of the contract suffered around a two-year delay and the EPC costs amounted to USD 5.9 billion.

144. Reficar brings three major claims in this arbitration:

145. First, at the beginning the EPC project was conceived as a lump sum contract, but was later changed into a cost reimbursable one. Reficar argues that it was tricked by CB&I into that change [the "**Pre-Contract Claim**"] and asks for USD 4 billion in compensation for additional costs.

146. Alternatively, Reficar makes the argument that CB&I breached its contractual duties to only incur reasonable costs and claims either USD 1.77 billion for the breach or USD 1.59 billion for reimbursement of unreasonable costs.

147. Reficar also alleges that CB&I breached its duties with regard to controlling the Project Schedule.

148. CB&I, on the other hand:

149. First, denies ever having tricked Reficar into changing the remuneration scheme and argues that Reficar made the change at free will and after careful third-party advice.

150. Second, affirms that all costs incurred were reasonable and proper and that it diligently progressed with the Project and so, no contractual duties were infringed.

151. Finally, CB&I counterclaims that Reficar still owes it overdue invoices. Reficar says that none of the unpaid invoices are due.

152. Before analysing these claims, the Tribunal will address certain pending procedural issues.

2. PENDING PROCEDURAL MATTERS

153. There are three procedural matters that require a decision from the Tribunal: the evidentiary weight attributable to witnesses who failed to attend the Hearing (**2.1.**) negative inferences from deficient document production (**2.2.**) and the shifting of the burden of proof (**2.3.**).

2.1. EVIDENCE BY WITNESSES WHO FAILED TO APPEAR AT THE HEARING

154. Two of Reficar's witnesses, Messrs. Christian Mantilla and Andrés Riera, failed to appear at the Hearing.

155. Mr. Mantilla is a civil engineer employed by Reficar's consultant, Foster Wheeler; he has acted as the vice-president of the Project, vice-president of pre-commissioning and start-up and advisor to Ecopetrol, Reficar's parent company[154]. Mr. Riera likewise served as the vice-president of the Project and vice-president of pre-commissioning and start-up; he later served as technical manager and refining advisor to Ecopetrol[155].

156. Reficar announced the witnesses' unavailability on May 13, 2021 (*i.e.*, four days prior to the Hearing) for Mr. Mantilla[156] and on May 20, 2021 for Mr. Riera[157] (*i.e.*, four days into the Hearing). CB&I submitted its objections to both announcements on May 13[158] and May 21[159], 2021, respectively.

157. Having heard the Parties at the Hearing regarding the witnesses' failure to appear, the Tribunal allowed the Parties to make written briefings on this issue in their post-hearing submissions and postponed its decision until the Award[160].

The Parties' positions

158. Reficar argues that both witnesses' statements should be kept in the record with full evidential value. According to Reficar, Mr. Mantilla had been instructed by his employer, Foster Wheeler, to refrain from attending the Hearing in light of the then-recent order issued by the *Contraloria* attributing fiscal liability to Foster Wheeler and some of its employees (with the two witnesses being directly affected); this order in Reficar's view constituted exceptional circumstances, justifying the witness's last-minute failure to appear[161]. Mr. Riera could not attend the Hearing for the same underlying reason of having to manage the aftermath of the *Contraloria* order, meaning that his absence was also caused by exceptional circumstances and thus justified[162].

159. CB&I requests that the Tribunal grant no evidentiary weight to the witness statements submitted by Messrs. Mantilla and Riera[163]. The reasons allegedly justifying the witnesses' last-minute failure to appear at the Hearing did not constitute exceptional circumstances and thus, the Tribunal should strike out the witness statements of Messrs. Mantilla and Riera, as well as any portions of expert reports submitted by Reficar which were based on information provided by these two witnesses[164]. CB&I also argues that it would be highly prejudiced if the

[154] Mantilla CWS; Mantilla CWS II; RPHB, para. 25.
[155] Riera CWS, RPHB, para. 25.
[156] Communication C-214.
[157] Communication C-220.
[158] Communication R-203.
[159] Communication R-209.
[160] Tr. 6902:11-6913:15; 6918:24-6923:7.
[161] Communication C-214.
[162] Communication C-220.
[163] RPHB, para. 24.
[164] RPHB, para. 35.

Tribunal accepted information from witnesses CB&I was unable to cross-examine[165].

Tribunal's decision

160. The Tribunal must decide whether it should strike from the record the witness statements of Messrs. Mantilla and Riera, as well as any portions of the expert reports submitted by Reficar which were based on information provided by these two witnesses.

161. In accordance with the Hearing Protocol agreed by the Parties and the Tribunal[166],

> "[t]he Tribunal shall not consider the Witness Statement of a Fact Witness who fails to appear if the Party proffering the Fact Witness in question fails to provide a legitimate reason for the Fact Witness's failure to appear".

162. The Tribunal must, then, decide, whether the failure to appear by Reficar's two witnesses was justified by "legitimate reasons".

163. Reficar avers that the Tribunal itself had previously considered the *Contraloria* proceedings to be an "exceptional circumstance" for the purposes of the current arbitration; thus, the new order issued by the *Contraloria* constituted a legitimate reason for the witnesses' failure to appear at the Hearing[167].

164. CB&I argues that the *Contraloria* proceedings had by the time of the Hearing been ongoing for years and the particular decision of the *Contraloria* invoked by Reficar's witnesses preceded the notification of their absence by two weeks' time[168]. And it would be highly prejudiced if the Tribunal accepts information from witnesses CB&I was unable to cross-examine[169].

165. The Tribunal finds that both Parties are partially correct.

166. On the one hand, Reficar is correct in arguing that the *Contraloria* proceedings have been recognised by the Tribunal as "exceptional circumstances"[170]; thus, upon the issuance of a new order by the *Contraloria*, that had a specific impact on the personal situation of the two witnesses, these witnesses indeed had a "legitimate reason" not to appear at the Hearing.

167. CB&I, on the other hand, is correct in arguing that its situation could be prejudiced by the fact that it has been unable to cross-examine two of Reficar's witnesses, whom it had specifically selected for these purposes.

168. As a result, the Tribunal will apply additional scrutiny to all the evidence in the case file based on the witness statements of Messrs. Mantilla and Riera and take account in assessing the weight given the fact that there was no opportunity for CB&I to cross-examine these witnesses. The Tribunal confirms, however, its prior decision

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[165] RPHB, paras. 33-34.
[166] HP, dated March 22, 2021, para. 79(b).
[167] Communication C-214; communication C-220.
[168] RPHB, paras 29-31.
[169] RPHB, paras. 33-34.
[170] Communication A 151 at para. 22; communication A 136 at para. 23.

not to strike out these witness statements, or any portions of the expert reports submitted by Reficar, based on the information provided by these witnesses.

2.2. NEGATIVE INFERENCES FROM DEFICIENT DOCUMENT PRODUCTION

169. Claimant asks for the Tribunal to draw negative inferences from Respondents' failure to produce documents ordered by the Tribunal[171].

170. These pertain to documents that, according to Claimant, "should have existed in the ordinary course of business, but CB&I has refused to produce them"[172], including categories such as internal analyses, memoranda, reports, communications, data underlying CB&I's methods of calculating productivity, and the close-out report for the Project[173].

171. CB&I has, in its opinion, fully complied with the Tribunal's orders regarding document production[174]. CB&I avers that Reficar's request should be denied, because Reficar has failed to present a narrowly tailored request, to prove that CB&I effectively withheld any documents, and to argue that the standard for drawing adverse inferences has been met[175].

Tribunal's decision

172. Reficar brings a request under Art. 9.5 of the IBA Rules on the Taking of Evidence in International Arbitration, which provides that[176]:

> "[i]f a Party fails without satisfactory explanation to produce any Document requested in a Request to Produce to which it has not objected in due time or fails to produce any Document ordered to be produced by the Arbitral Tribunal, the Arbitral Tribunal may infer that such document would be adverse to the interests of that Party".

173. As regards the standard for drawing negative inferences from failures in document production, it is widely accepted that such inferences may only be drawn in exceptional circumstances[177].

174. Reficar only makes a generic request for a declaration "that these documents and the evidence contained therein would be adverse to the interests of CB&I"[178]. Consequently, Claimant has failed to establish a specific and narrow request of what inferences exactly it wishes the Tribunal to draw from CB&I's alleged failure to

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[171] ESOC, paras. 528-538.
[172] ESOC, paras. 528.
[173] ESOC, paras. 535-536.
[174] ESOD, paras. 1601-1602, 1609.
[175] ESOD, paras. 1597-1600.
[176] CL-0734.
[177] RL-489, S. Greenberg and F. Lautenschlager, "Adverse Inferences in International Arbitral Practice", *ICC International Court of Arbitration Bulletin*, Vol. 22, number 2, (2011), p. 43 (pdf p. 1).
[178] ESOC, paras. 534-536. Reficar provides certain examples of documents that CB&I allegedly failed to produce but only provides arguments as to their existence and concludes each "example" with the same generic request that "the Tribunal should draw an adverse inference that such documents would be adverse to CB&I's interests".

produce documents, nor that there are exceptional circumstances which justify such an extreme measure.

175. There is also no evidence in the record suggesting that CB&I was in fact in possession of the requested documents, but willfully refused to produce them despite being ordered to do so by the Tribunal.

176. In the present case, the Tribunal rejects Claimant's request.

2.3. SHIFTING OF BURDEN OF PROOF

177. Reficar also requests that the Tribunal apply in the Award the "dynamic burden of proof" theory under Art. 167 of the Colombian General Code of Procedure and shift the burden of proof for a number of issues from Reficar to CB&I[179]: CB&I is the Party with superior or exclusive access to certain evidence, and it should thus be the Party having to meet the burden of proof[180].

178. CB&I avers that Reficar's request for shifting the burden of proof in this arbitration cannot be brought under a procedural rule provided for in Colombian law[181]. In any event, the conditions of the provision of Colombian law invoked by Reficar, such as the timeliness of the request and appealability, are not met[182].

Tribunal's decision

179. Reficar requests that the Tribunal apply in this Award Art. 167 of the Colombian General Code of Procedure to shift the burden of proof from Reficar to CB&I for several issues, for which, in Reficar's view, CB&I is the Party with superior or unique access to the underlying evidence.

180. CB&I asks the Tribunal to deny Reficar's request, as the underlying provision under Colombian law does not apply to this arbitration and, even if it did, Reficar's request is unacceptable: the Tribunal cannot shift the burden of proof in the Award as required by Reficar – such decision would have to be taken well in advance, but Reficar failed to request a prior decision.

181. The Tribunal sides with CB&I.

182. The relevant provision states as follows[183]:

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[179] Reply, paras. 1005-1007.
[180] Reply, paras. 1008-1015.
[181] RPHB, para. 667.
[182] RPHB, para. 668-669.
[183] CL-0535; English translation:
"ARTICLE 167. BURDEN OF PROOF. It is incumbent on the parties to prove the factual basis of the rules enshrining the legal effect that they are pursuing.
However, depending on the characteristics of the case, the court may, sua sponte or at the request of a party, distribute, the burden of proof by ordering the production of evidence, during examination of the evidence or at any time during the procedure before it announces its decision, and demanding that a particular fact be proven by the party that is in a more favorable situation to provide the evidence or to clarify the disputed facts. A party will be considered best placed to prove a fact due its proximity to the evidence, because it has the evidence in its possession, due to special technical circumstances, because it played a direct role in

> *"ARTÍCULO 167. CARGA DE LA PRUEBA. Incumbe a las partes probar el supuesto de hecho de las normas que consagran el efecto jurídico que ellas persiguen.*
>
> *No obstante, según las particularidades del caso, el juez podrá, de oficio o a petición de parte, distribuir, la carga al decretar las pruebas, durante su práctica o en cualquier momento del proceso antes de fallar, exigiendo probar determinado hecho a la parte que se encuentre en una situación más favorable para aportar las evidencias o esclarecer los hechos controvertidos. La parte se considerará en mejor posición para probar en virtud de su cercanía con el material probatorio, por tener en su poder el objeto de prueba, por circunstancias técnicas especiales, por haber intervenido directamente en los hechos que dieron lugar al litigio, o por estado de indefensión o de incapacidad en la cual se encuentre la contraparte, entre otras circunstancias similares.*
>
> *Cuando el juez adopte esta decisión, que será susceptible de recurso, otorgará a la parte correspondiente el término necesario para aportar o solicitar la respectiva prueba, la cual se someterá a las reglas de contradicción previstas en este código [...]"* [Emphasis added].

183. Paragraph 1 of Art. 167 establishes the general principle that each party must prove the facts on which it relies to request the application of a certain legal norm. The application of this general principle is accepted by both Parties and will be applied by the Tribunal, with the *caveats* explained in subsequent sections.

184. Reficar requests that the Tribunal also apply the second paragraph of Art. 167, which grants the Colombian judge the possibility of shifting the burden of proof to the party which is in a more favourable situation to marshal the evidence. The option to make such a decision is restricted by several conditions: the decision must be subject to appeal and should be pronounced in the early stages of the proceeding, as the party burdened with the evidence must be given the opportunity to discharge its duty.

185. As an initial matter, it is doubtful whether para. 2 of Art. 167, which grants a power to Colombian judges ("*el juez podrá*"), can find application to arbitrators in an arbitration seated in New York. Be that as it may, Reficar's request does not meet the high threshold set forth by para. 2 of Art. 167:

- First, the request must be made early in the procedure, so that the party burdened with the duty has sufficient time to marshal the evidence – in the current proceeding, Reficar only made a request for the application of para. 2 of Art. 167 when it filed its Reply[184];

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the events that gave rise to the dispute, or because the other party is denied due process or lacks capacity, among other similar circumstances.
When the court adopts this decision, which will be subject to appeal, it shall grant the corresponding party the time necessary to provide or request the evidence in question, which will be subject to the rules of rebuttal specified in this code".

[184] Reply, paras. 1005-1010.

- Second, Reficar has reiterated its request in its PHB[185], asking the Tribunal to apply para. 2 of Art. 167 in the Award; but the provision contains a clear prohibition of the shifting of the burden of proof at the stage of rendering the Award; instead, it must precede the Award (*en cualquier momento del proceso antes de fallar*);

- Third, the decision by the judge must be subject to appeal – this is impossible in an arbitration, reinforcing the finding that this rule is not to be applied in arbitral proceedings.

186. Thus, in this Award, the Tribunal will apply the ordinary rules governing the burden of proof under Colombian law.

[185] CPHB, paras. 143, 179, 526-527.

IV. LAW APPLICABLE TO THE DISPUTE

187. Two major bodies of law find application to the current dispute: first, and foremost, the contract between the Parties (**1.**) and, second, generally applicable law of either of the two jurisdictions elected by the Parties – Colombian law or the law of the State of New York ["**New York Law**"] (**2.**).

188. The Tribunal will also analyse the law applicable to its power to grant indirect or consequential damages (**3.**).

1. THE EPC CONTRACT

189. Reficar and the CB&I entities are bound by six agreements collectively known as the EPC Contracts.

190. Out of these six agreements (i) only two are, strictly speaking, EPC contracts, (ii) the rest are ancillary contracts.

191. (i) The engineering, construction and procurement contracts are:

- The "**Onshore Contract**" between Reficar and CB&I Colombiana, governed by Colombian law, for work (mainly construction) performed by CBI Colombiana in Colombia[186],
- The "**Offshore Contract**" between Reficar and CB&I UK, governed by New York law, for design, engineering, procurement and other work performed by CB&I UK primarily outside of Colombia[187].

192. (ii) The ancillary contracts are:

- A parent guarantee between Reficar and CB&I N.V., governed by New York law, for CB&I Colombiana's obligations under the Onshore Agreement [the "**Onshore Parent Guarantee**"][188],
- A parent guarantee between Reficar and CB&I N.V., governed by New York law, for CB&I UK's obligations under the Offshore Agreement [the "**Offshore Parent Guarantee**"][189],
- The "**Coordination Agreement**" executed by Reficar, CB&I UK and CBI Colombiana, governed by New York law, providing for the coordination of obligations under the Onshore and Offshore Contracts and the resolution of any interpretation conflicts[190],

[186] JX-002; JX-003; JX-006.
[187] JX-004; JX-005; JX-006.
[188] JX-008, pdf pp. 1-16.
[189] JX-008, pdf pp. 17-32.
[190] JX-007, pdf pp. 29-44.

- The DRA between Reficar and CB&I UK, CBI Colombiana, CB&I, N.V., governed by New York law and providing for the system of resolving any disputes between the Parties under the EPC Contracts[191].

2. COLOMBIAN OR NEW YORK LAW

193. The Parties were very much aware of the fact that the EPC work was governed by two distinct contracts – the Onshore and the Offshore Contracts – subject to different applicable laws – Colombian and New York law, respectively – and that discussions in that regard might arise in case of dispute. This is why Sections 4.1[192] and 4.2.2[193] of the Coordination Agreement provide that neither Party can excuse its liability alleging that the claim against it was brought under the wrong Contract:

> "4.1 Claims by the Owner
>
> Each Contractor undertakes not to contend, in connection with any Dispute (including any alternative dispute resolution process, arbitration or judicial proceeding) or otherwise, that it is not liable in respect of any Dispute made as aforesaid on the grounds that such Dispute should properly have been made under a Contract other than the one under which it is made.
>
> [...]
>
> 4.2.2 The Owner undertakes not to contend, in connection with any Dispute (including any alternative dispute resolution process, arbitration or judicial proceeding or otherwise, that it is not liable in respect of any Dispute made as aforesaid on the grounds that such Dispute should properly have been made under a Contract other than the one under which it is made".

194. Since it was the Parties' intention that liability be enforced, even if claimed under the wrong Contract, it naturally follows that the same should result if the claim is brought under the wrong applicable law. Consequently, provided that liability exists under any of the Contracts and either under Colombian or New York law, such liability will be enforced, and the party liable has waived its right to argue that the dispute should properly have been brought under another Contract or another legal system.

195. CB&I has raised as a defensive argument, that some of Reficar's claims should be dismissed, because they were pleaded under the wrong law. The Tribunal finds this argument non convincing and contrary to the Parties' express agreement.

196. Notwithstanding the above, the Tribunal will now make an analysis of the applicable law for the three different claims brought by Reficar: pre-contract claims (**A.**), contract claims (**B.**), and the fiduciary liability claim (**C.**).

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[191] JX-007, pdf pp. 3-27.
[192] JX-007, p. 34.
[193] JX-007, pp. 34-35.

A. Pre-contract claims

197. The majority of the controversies as to the applicable law arise as regards Reficar's pre-contractual claims against CB&I.

Reficar's position

198. Reficar avers that the dual contract arrangement (Onshore and Offshore Contracts) was made for tax purposes rather than to create separate obligations and defenses under the distinct agreements[194]. The contractual origin of the claim is therefore, irrelevant.

199. But, if the pre-contractual claim was to be pinpointed to one of the Contracts, it would be the Onshore Contract, because the majority of misconduct and consequences for pre-contractual phase occurred in Colombia[195]. Hence, pre-contractual claims are governed by Colombian law.

200. Reficar additionally argues that the application solely of Colombian law is also in line with the Parties' approach during the Hearing, as only Colombian law experts were called[196], and is further reinforced by notions of fairness[197].

CB&I's position

201. CB&I agrees with Reficar that Onshore Contract-related pre-contractual claims are governed by Colombian law[198].

202. However, according to CB&I, for Offshore Contract-related pre-contractual claims, New York law applies due to the choice-of-law provisions in the EPC Agreements and pursuant to the ICC Rules' mandate for the Tribunal to apply the law chosen by the Parties[199].

203. CB&I argues that New York courts construe pre-contractual claims to be covered as also "arising out of" or "related to" the contract – thus New York law applies to Offshore Contract-related pre-contractual claims[200].

204. As a consequence, CB&I argues that Reficar either does not assert or has abandoned any claims in relation to the Offshore Agreement. Even if this is not the case, Reficar has failed to establish its case under New York law, which is required for any Offshore Contract claims[201].

Discussion

205. Reficar brings pre-contract claims based on CB&I's alleged breach of precontractual information duties. In Reficar's opinion, had it not been for CB&I's

[194] CPHB, para. 33.
[195] CPHB, paras. 28, 43; Reply, para. 15; ESOC, para. 549.
[196] CPHB, para. 29.
[197] CPHB, para. 29.
[198] RPHB, para. 11.
[199] RPHB, para. 10.
[200] RPHB, para. 10.
[201] RPHB, para. 68, fn. 141.

misleading information, it would have entered into the EPC Contracts under different pricing terms.

206. Reficar has concentrated its pre-contract claims under Colombian law. CB&I argues that this choice should lead to the dismissal of any pre-contract claims arising out of the Offshore Contract.

207. The Tribunal will, ultimately, reject Reficar's pre-contract claims, but not because of the choice of applicable law.

208. As a point of departure, the Tribunal recalls that its mandate, in accordance with Art. 21(1) of the ICC Rules, is to apply the law chosen by the Parties[202]:

> "Applicable Rules of Law
>
> 1 The parties shall be free to agree upon the rules of law to be applied by the arbitral tribunal to the merits of the dispute. In the absence of any such agreement, the arbitral tribunal shall apply the rules of law which it determines to be appropriate".

209. According to CB&I, this means that New York law applies to those pre-contract claims that relate to the Offshore Agreement, as provided for under Section 4.12 of the DRA:

> "4.12 The Arbitral Tribunal shall be governed by and shall apply the substantive law governing the Agreement under which the Dispute(s) arise. If the Dispute(s) refers to two (2) or more agreements with different applicable law, the Arbitral Tribunal shall apply the applicable law of the Agreement to the part of the Dispute(s) that refers or relates to each Agreement". [Emphasis added]

210. The Tribunal does not agree with CB&I.

211. Reficar's pre-contract claim refers to a breach of precontractual duties during the negotiation of the EPC Contract, generally speaking. Reficar has not singled out breaches which would specifically affect its consent to the Onshore or the Offshore Contract – Reficar refers to general misinformation on CB&I's side regarding the estimate of costs and work schedule involved in the Contract. Hence, the Tribunal cannot split the dispute and attribute a part of it "to the related agreement" – as envisaged in the DRA.

212. The Parties had also foreseen this situation when drafting the EPC Contract. The recitals of the DRA – the agreement specifically entered into to govern the process of dispute resolution, and which forms part of the EPC Contract in general – favour that only one law be applied[203]:

> "[t]he inter-related nature of the Project Agreements means that Disputes may arise under one Project Agreement which are related to Disputes which arise under one or more other Project Agreements, and it is in the interest of the

[202] RPHB, para. 10, citing to ICC Rules, Art. 21(1).
[203] JX-007, para. B, p. 4.

> Parties that such related Disputes be resolved in a consistent manner". [Emphasis added]

213. In this case, Reficar chose Colombian law – an option open to it, according to the DRA, which CB&I cannot question invoking Section 4.12 of the DRA, because the dispute affects both the Onshore and the Offshore Agreements and cannot be split.

214. But even if CB&I were right, and the pre-contract claim were divisible and partially attributable to each Contract (*quod non*), Section 4.1 of the Coordination Agreement would put an end to CB&I's argument, as it bars a party from bringing precisely the excuse CB&I is now pleading[204]:

> "4.1 Claims by the Owner
>
> Each Contractor undertakes not to contend, in connection with any Dispute (including any alternative dispute resolution process, arbitration or judicial proceeding) or otherwise, that it is not liable in respect of any Dispute made as aforesaid on the grounds that such Dispute should properly have been made under a Contract other than the one under which it is made".

215. In any event, the discussion above is purely academic, because ultimately, the Tribunal will dismiss these claims for lack of merit, irrespective of the legal system to be applied.

B. Contract claims

216. Reficar also brings a claim for contractual breaches based on the fact that CB&I allegedly charged for costs it was not contractually allowed to recover, which must be returned to Reficar; CB&I's failures also led Reficar to incur other additional costs on the Project.

217. As regards contractual liability, the legal framework is essentially confined to contractual provisions. The only area in which the discussion on Colombian or New York law becomes relevant concerns the interpretation of the liability cap provisions.

218. Both Parties agree that the contractual provision which could lead to the lifting of the liability cap in the current dispute is TC 8.1.1 (iii).

219. TC 8.1.1 (iii) in the Spanish version of both the Onshore and Offshore Contracts stipulates that the liability cap in the EPC Contract does not apply to[205]:

> "(iii) *responsabilidad derivada de cualquier fraude, Culpa Grave o Dolo, incurridos por el Contratista*",

which in the English version provides as follows[206]:

[204] JX-007, p. 34.
[205] JX-002, p. 51; JX-004, pp. 49-50.
[206] JX-002, pp. 180-181; JX-004, p. 166.

"(iii) liability arising from any fraud, Gross Negligence or Willful Misconduct committed by the Contractor".

220. In order to fully ascertain the meaning of the concepts enumerated as exceptions to the liability cap – *fraude*, *culpa grave*, *dolo* and fraud, gross negligence, willful misconduct – the Tribunal will undertake an analysis guided by the definitions section of both the Onshore and Offshore Contract.

221. The Onshore Contract provides that the terms "*Culpa Grave*"[207] and "*Dolo*"[208] have the meaning given to them under the Colombian Civil Code [the "**CCC**"]. The equivalent terms "Gross Negligence"[209] and "Willful Misconduct"[210], under the English version, refer to the same provisions under Colombian law.

222. "Willful Misconduct" is further described in the English version of the Offshore Contract as "an intentional act or omission that the relevant Person knew or should have known was wrongful"[211]. The equivalent term in Spanish is defined as "*Mala Conducta Intencional*" – a literal translation of "willful misconduct". The term is followed by "(Dolo)" in parentheses, which means that the Offshore Agreement equates willful misconduct and *dolo*[212].

223. The terms "*Culpa Grave*" and "Gross Negligence" are not defined in the Offshore Contract.

224. The above suggests that the Parties understood (i) *culpa grave* and gross negligence and (ii) *dolo* and willful misconduct to have equivalent meaning in the context of the performance of the Contract; (iii) the same is applicable to *fraude* and fraud.

225. The Tribunal further confirms that, as will be explained in section VIII.1 *infra*, *culpa grave* under Colombian law and gross negligence under New York law (the only relevant concepts to the discussion on contractual liability), are very similar concepts, so that any contractual performance which qualifies as the former under Colombian law would also meet the requirements for the latter under New York law.

226. The Tribunal will address these similarities, whenever necessary, in the respective sections on liability, where a detailed analysis and comparison of these legal concepts will be presented[213].

C. Fiduciary liability claim

227. The final, alternative claim brought by Reficar in case the Tribunal dismisses the contract claims, is for an alleged breach of CB&I's fiduciary duties towards Reficar

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[207] JX-002, p. 31.
[208] JX-002, p. 32.
[209] JX-002, p. 166.
[210] JX-002, p. 171.
[211] JX-004, p. 157.
[212] JX-004, p. 34.
[213] Even though these concepts are discussed in the context of contractual liability here, the Tribunal notes that the concept of *dolo* will also be key for assessing pre-contract liability. Thus, the respective analyses may be found as follows: for pre-contractual *dolo*, see Section VII.1.3.2; for *culpa grave*/gross negligence, see Section VIII.1.

under New York law. There is no discussion between the Parties as to the law under which this claim has been pleaded.

228. In any event, the Tribunal will eventually find CB&I liable for contract breaches; thus, the fiduciary claim must be considered moot to avoid Reficar obtaining double recovery.

3. THE TRIBUNAL'S POWER TO GRANT INDIRECT OR CONSEQUENTIAL DAMAGES

229. Reficar's primary claims under the EPC Contract are twofold:

- That CB&I breached the Contracts by charging unreasonable and improper costs for the Refinery, which Reficar never should have paid and which it believes to be entitled to claw back.

- That CB&I was late in the delivery of the Refinery, entitling Reficar to claim delay penalties and lost profits.

230. Reficar also brings an ancillary claim: the cost of capital.

231. There is no question that under the applicable law, these claims seem, *prima facie*, available to Reficar as the aggrieved party. The question is whether the Parties agreed to make them unavailable in this arbitration before this Tribunal.

232. CB&I says that Section 4.13 of the DRA carves out loss of profits and cost of capital from the Tribunal's competence[214]:

> "The Arbitral Tribunal shall neither have nor exercise any power to act as *amicable compositeur* or *ex aequo et bono*, or to award special, indirect, consequential or punitive damages". [Emphasis added]

233. CB&I interprets "indirect or consequential damages" as encompassing claims for lost profits and cost of capital[215]. Reficar argues that both its loss of profit and its cost of capital claims are direct and fall outside of the scope of this provision[216].

234. Since the discussion revolves around the correct construction of certain terms included in the DRA, the Tribunal must resort to New York law, as the applicable law under that agreement[217]:

> "(…) shall be governed by and construed in accordance with the laws of the State of New York (…), whose state and federal courts shall have sole and exclusive jurisdiction over the enforcement or challenge to the enforcement of this Dispute Resolution Agreement" [Emphasis added].

235. The Tribunal also notes that New York is the seat of the arbitration, as per Section 4.9 of the DRA, and that questions regarding the Tribunal's scope of authority and

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[214] JX-007, p. 11.
[215] RPHB, paras. 156-161.
[216] ESOC, para. 782, CPHB, paras. 444, 503, 507.
[217] JX-007, Section 14.

limitations thereto introduced by the Parties' agreement, should be adjudicated in accordance with the seat of arbitration; as indicated by Gary Born,

> "[…] issues concerning the arbitral tribunal's power and jurisdiction with respect to remedial authority are governed by the law of the arbitral seat […]"[218].

236. The Tribunal will address this issue in Section VII.3 *infra*.

[218] Born, G., International Commercial Arbitration, 2021, Kluwer Law International, section 23.04(D).

V. FACTS

237. The facts underlying the present dispute are considerably complex. In this section the Tribunal offers an overview of the factual developments, to permit the reader an understanding of the subsequent discussion of the matters to be adjudicated.

238. A detailed analysis of the factual background pertinent to each of the claims and counterclaims presented by the Parties will be provided by the Tribunal in the relevant sections of the Award.

1. DRAMATIS PERSONAE

Claimant

239. Claimant is Refinería de Cartagena S.A., a mixed-capital company (*sociedad de economía mixta*) organized under Colombian law as a corporation (*sociedad anónima simplificada*) with its principal place of business in Cartagena, Colombia. It is also the owner of the Cartagena Refinery in Cartagena, Colombia and engages in the refinery of crude oil and the production of petrochemical products.

240. Reficar is a 100% wholly-owned subsidiary of Ecopetrol S.A., which is also a mixed-capital company (*sociedad de economía mixta*), organized under Colombian law (*sociedad anónima*). Ecopetrol is an oil and gas company, which is approximately 90% owned by the Republic of Colombia, and engages in exploration and production, transportation and logistics, refining, petrochemicals and biofuels. Ecopetrol is listed on the New York and Toronto Stock Exchanges.[219]

Respondent 1

241. Respondent 1 is CB&I N.V., a limited liability company (*naamloze venootschap*) organized under the laws of The Netherlands and its main place of business in Houston, Texas. CB&I N.V.'s stock trades on the New York Stock Exchange under the ticker symbol "CBI". CB&I N.V. provides conceptual design, technology, engineering, procurement, fabrication, construction and commissioning services to customers in the energy, petrochemical and natural resources industries.

Respondent 2

242. Respondent 2 is CB&I UK Ltd., a limited liability company existing under the laws of the United Kingdom and a 100% wholly-owned subsidiary of CB&I N.V. CB&I UK provides design, design-build, engineering, fabrication, procurement, construction and maintenance services for oil and gas, power, and allied industry projects in, among other places, South America.

Respondent 3

243. Respondent 3 is CBI Colombiana S.A. is a limited liability company organized and existing under the laws of Colombia (*sociedad anónima*) and is a 100% wholly-owned subsidiary of CB&I N.V. CBI Colombiana provides, among other things,

[219] RfA, para. 7.

general contracting services such as constructing large projects. On September 15, 2020 counsel to CB&I UK and CB&I N.V. informed the Tribunal of a liquidation order concerning CBI Colombiana[220]. The last update on the status of CBI Colombiana was received by the Tribunal on November 11, 2020 in a letter from the Liquidator[221].

2. PRE-CONTRACTUAL STAGE

244. The Cartagena Refinery Modernization and Expansion Project [the "**Project**" or the "**Refinery Project**"] is one of the largest construction endeavours in the energy sector in the recent history of Colombia.

245. Conceived as early as the beginning of the 2000s by the Refinery owner, the state-owned company Ecopetrol, the Project went through years of initial planning, followed by securing the co-operation of Glencore[222] and the creation of a special purpose vehicle, Reficar[223], the claimant in this arbitration[224].

246. Due to the sheer size of the undertaking, the bulk of the Project was divided into two stages, each with a separate contract:

- The initial agreement for process design and basic engineering [the "**Project Definition Contract**"], and

- The main agreement for the engineering, procurement and construction of the Project, which would eventually be the EPC Agreement.

247. One of the key aspects in deciding to whom to award the contracts was the willingness and ability of the contractor to undertake works under a lump sum turnkey ["**LSTK**"], rather than cost-reimbursable ["**RC**", also "**cost plus**"] basis[225]:

- In an LSTK contract the contractor tenders a price for the completion of the scope of works – hence, the risk of cost overruns and delays lies with the contractor and not with the owner;

- In a cost-reimbursable contract, the contractor bills the owner the costs incurred in the completion of the scope of works plus a margin – thus, the price and time risks rests with the owner and not with the contractor.

248. Three international construction companies participated in the bidding procedure for the Project Definition Contract[226]; CB&I won, with its proposal being scored highest by Reficar's external consultant[227].

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[220] See communications A 107 and R-124-R-126.
[221] Letter from the Liquidator dated November 11, 2020.
[222] Ex. R-0468; Houtz CWS, para. 15.
[223] The Tribunal notes that in some of its written submissions, Claimant uses the name Refinería de Cartagena S.A.S. instead of Refinería de Cartagena S.A.
[224] Ex. C-0024, p. 5; Ex. R-0473, p. 17; Houtz CWS, para. 16.
[225] See e.g., the Parties' respective arguments at CPHB, para. 62; RPHB, para. 84.
[226] Ex. C-0054, p. 8.
[227] Ex. C-0054, p. 12.

249. The Project would start under a cost-reimbursable basis in the Project Definition Contract, signed in November 2007[228]; this phase was later to be followed by a definitive EPC Agreement on an LSTK basis[229].

250. This initial assumption changed, however, with the evolution of market conditions.

251. In spring of 2008, CB&I's director of business development informally told Reficar's Mr. Houtz about CB&I's preference to move with the EPC Agreement on a cost plus basis.

252. Reficar undertook independent scrutiny of the risks and benefits of the two contracting models and instructed an external consultant to prepare a detailed comparison study, whose results stated that "a satisfactory LSTK arrangement may not be achievable"[230] and recommending the contract to be signed on a cost plus basis[231].

253. On the basis of the study, Reficar's Board of Directors ["**BofD**"] asked Reficar's management to formally approach CB&I about the possibility to switch the modality of the future EPC Agreement from LSTK to RC[232].

254. Reficar's BofD, however, kept pondering which contracting modality to use for the EPC Contract until November 2009, when the Letter of Intent ["**LOI**"], greenlighting the commencement of EPC activities by CB&I, was signed in anticipation of the EPC Agreement, explicitly on a cost-reimbursable basis[233].

255. Reficar now claims, in essence, that it was tricked by CBI into shifting to a pricing modality which placed the risk of cost overruns on Reficar[234].

256. Apart from the contracting modality, Reficar also requested that CB&I prepare two types of deliverables[235]:

- cost estimates, and

- a planned work schedule.

257. In January 2009 CB&I issued the Execution Masterplan, which required CB&I to prepare a cost estimate within a +/10% accuracy margin and a Level 3 work schedule[236].

258. The two cost estimates that played a key role in the pre-contract stage were the **July 2009 Estimate** and the **February 2010 Estimate**.

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[228] Ex. R-0010 (Ex. C-0006). Apart from CB&I, Technip was also involved in the 2007 Project Definition Contract, even though it acceded through a separate agreement.
[229] Ex. R-0010, Schedule One, para. 1, p. 56.
[230] Ex. R-0487, p. 6.
[231] Ex. R-0487, pp. 7-8.
[232] Ex. C-0014, pp. 5-6.
[233] RFA Ex. 30.
[234] CPHB, paras. 62-72.
[235] See analysis of these deliverables in Section VII.1.3.1 *infra*.
[236] Ex. C-0024.

259. The July 2009 Estimate stated that it adhered to AACE Class II +/-10% accuracy[237] (the AACE is a leading association of cost engineers) and was presented to Reficar on August 3, 2009[238], at the amount of USD 3.495 billion[239].

260. The July 2009 Estimate was affected by further negotiations between the Parties and certain scope changes instructed by Reficar; thus, on February 28, 2010, CB&I produced its Revision 2 – Final Estimate Scope to the July 2009 Estimate[240] [known as the "**February 2010 Estimate**"][241].

261. As regards the work schedule, CB&I submitted a preliminary Level 3 Schedule on March 25, 2010[242], which Reficar rebutted as incomplete[243]. CB&I later delivered a modified version, called the **April 2010 Schedule**[244], which was not attached to the EPC Contract. Instead, the Parties agreed for CB&I to deliver the final Level 3 Schedule within 90 days after the execution of the EPC Contract; CB&I submitted such schedule as the **October 2010 Re-Baseline Schedule**[245].

3. EPC CONTRACT

262. On November 10, 2009, Reficar and CB&I entered into the LOI[246], which contained the key commercial terms and interim provisions while the Parties negotiated in good faith towards the final RC based EPC Contract[247].

263. Finally, on June 15, 2010, Reficar and the CB&I entities entered into six agreements collectively known as the final EPC Agreement, which comprises the following documents:

- The **Onshore Contract** between Reficar and CB&I Colombiana for work (mainly construction) performed by CBI Colombiana[248],
- The **Offshore Contract** between Reficar and CB&I UK for design, engineering, procurement and other work performed by CB&I UK primarily outside of Colombia[249],
- The Coordination Agreement executed by Reficar, CB&I UK and CB&I Colombiana[250],

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[237] Exs. R-0033, p. 1; C-0748; C-0400, p. 2.
[238] Ex. R-0524.
[239] Ex. R-0524, p. 231.
[240] Ex. C-0041 (Ex. R-0546), p. 2.
[241] As a threshold matter, on the basis that the document is named "31 July 2009 Class [2] (+/-10%) Revision 2 – Final Estimate Scope February 28, 2010", the Tribunal shall refer to the document as the **February 2010 Estimate** taking into account that multiple documents in the record have revisions, and they are always referred to by the Parties under their original iteration's name.
[242] Ex. C-1741.
[243] Ex. C-0050.
[244] Ex. C-0051, p. 1.
[245] Ex. C-0058, pp. 15-21, 73.
[246] RFA Ex. 30.
[247] Ex. R-0047 (Ex. C-0037).
[248] JX-002; JX-003; JX-006.
[249] JX-004; JX-005; JX-006.
[250] JX-007, pdf pp. 29-44.

- The Dispute Resolution Agreement between Reficar and CB&I UK, CBI Colombiana, CB&I, N.V.[251],
- The Onshore Parent Guarantee[252],
- The Offshore Parent Guarantee[253].

264. The EPC Agreement is a set of voluminous documents; the key provisions for the purposes of the current dispute are twofold:

265. First, CB&I assumed certain **Cost Control Commitments**: it promised

- to rigorously control cost and schedule similar to a lump sum contract, and
- to safeguard Reficar's resources as if their own[254].

266. In addition, CB&I assumed the **Reasonable Cost Obligation**: to only incur costs which meet the criteria of being:[255]

- reasonable,
- properly incurred, and
- in accordance with the Contract.

267. Second, with regard to Schedule, CB&I undertook a twofold obligation ["**Schedule Control Commitments**"] to

- advance the Works to the point where the Project would be ready for pre-commissioning and start-up ["**PCS**"] by the date guaranteed in the Contract, and
- proceed with the Works regularly and diligently.

268. Third, CB&I's total aggregate liability to Reficar under or in connection with the EPC Contract would be limited to a total of USD 85.75 million, with explicit exceptions for liability arising from *fraude*, *culpa grave* or *dolo* under the Onshore Agreement and fraud, gross negligence or willful misconduct under the Offshore Agreement[256].

4. CONTRACTUAL STAGE

269. After the signing of the EPC Agreement, CB&I continued to proceed with the Works without any signs of delays or excess costs during the latter half of 2010.

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[251] JX-007, pdf pp. 3-27.
[252] JX-008, pdf pp. 1-16.
[253] JX-008, pdf pp. 17-32.
[254] Project Execution Plan, Exhibit 13 to the Onshore and Offshore EPC Contract, para. 3; JX-002, p. 654; JX-004, p. 628.
[255] Section IV, Appendix I to the EPC Contract, JX-003, p. 3; JX-005, p. 3.
[256] See TC 8.1.1 at JX-002, pp. 180-181; JX-004, p. 166.

270. To control costs in real time, CB&I was contractually bound to provide to Reficar monthly cost forecasts ["**Monthly Forecasts**"], an estimate of the total EPC costs that Reficar would incur until the finalization of the Project, and of the necessary schedule[257].

Representation Letter on costs and schedule by CB&I

271. Starting in 2011, the cost and schedule management of the Project began to display deficiencies:

- in February 2011 CB&I's Monthly Forecast suddenly indicated a delay in the **Mechanical Completion Date** from February to October 2013[258];
- three months later, the May 2011 Monthly Forecast recorded delays in all activities (apart from engineering)[259];
- the August 2011 Monthly Forecast showed a bleaker perspective: CB&I was now forecasting that the EPC costs would increase by USD 400 million to USD 3,641 million[260]; and
- The Monthly Forecast for November 2011 estimated EPC costs at USD 3.639 billion[261]; the number increased in December 2011 to USD 3.809 billion[262] and was revised in January 2012[263] to USD 3,971 million[264].

272. Note that in one year the Monthly Forecasts had increased more than USD 700 million (from USD 3.2 billion to almost USD 4 billion – a 22% increase).

273. As a result of these discrepancies, the Parties unsuccessfully tried to renegotiate the EPC Agreement[265].

274. As Reficar's frustration with the exploding cost forecast grew, it eventually informed CB&I that it would "take action outside the contract" if CB&I failed to prove it could bring the Project costs under control[266].

275. To appease Reficar, on May 22, 2012 CB&I issued a letter to Reficar, signed by its Project Director, Mr. Deidehban[267], in which CB&I reiterated the accuracy of the USD 3,971 million cost Forecast issued in December 2011 [the "**Representation Letter**"].

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[257] See Project Controls Execution Plan, Annex 6 to Onshore and Offshore Agreements, para. 7.1; JX-002, p. 478; JX-004, p. 453.
[258] Ex. C-1864, p. 4.
[259] Ex. C-0067, p. 7.
[260] Ex. C-0069, p. 4.
[261] Ex. R-1851_057_00015, fourth tab, in yellow, "Project Summary".
[262] Ex. C-0222, p. 4; Ex. R-1851_057_00016, fourth tab, in yellow, "Project Summary".
[263] Ex. C-0088, p. 4.
[264] Ex. R-1851_057_00017, fourth tab, in yellow, "Project Summary".
[265] Ex. R-1480, p. 8; Ex. R-1476, p. 5.
[266] Ex. C-0089, p. 3: "It is critical to demonstrate control with the evolution of the project as, without this, there will be a need to take action outside the contract".
[267] Ex. R-1849_07396.

276. But Mr. Deidehban did not only repeat the validity of the Forecast; he also went one significant step further. Until then, CB&I had represented that its estimates were at best Class II +/-10%. Now, for the first time, CB&I formally represented to Reficar that this USD 3,971 million Forecast met the highest accuracy requirements of the industry: it complied with the requirements of a Class I +/-5% estimate[268].

Ultimate costs on the Project

277. Notwithstanding the Representation Letter, the Monthly Forecasts did not stop growing. By September 2012, the Monthly Forecast reached USD 4,221 million[269] and by October USD 5,467 million[270], an increase of USD 1,246 million (or 23%) in just one month. This prompted further alignment meetings, which led to CB&I slightly reducing the forecast to USD 5,371 million in December 2012[271].

278. By mid-2013 CB&I appeared to have stabilized the forecasted costs and schedule. But then, between July and September 2013, the Project suffered serious labour disruptions, which included work stoppages and a strike. In August there was an explosion in the FCC Unit[272], which also impacted on schedule.

279. Using the labour disruptions as its main excuse, CB&I once again increased its Monthly Forecast in February 2014, this time to USD 6.27 billion[273], a number which remained relatively stable until the end of the Project, with the final EPC cost projection from December 2015 being slightly reduced to USD 6,214 million[274].

280. Reficar ultimately paid to CB&I USD 5,908.2 million in EPC costs[275]. Additionally, in the present arbitration CB&I has filed a counterclaim for unpaid Project costs of USD 267.26 million[276]. If both amounts are added, the total Project costs paid by CB&I plus the amounts still under dispute reach up to USD 6,175 million. Reficar claims in this arbitration that nearly USD 2 billion were incurred by CB&I in breach of the Contract's Cost Control Commitments.

281. *Pro memoria*, in the May 2012 Representation Letter, delivered when construction had already been progressing for almost two years, CB&I submitted to Reficar a forecast of USD 3,971 million, representing that this figure met the Class I +/-5% requirements.

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[268] Ex. R-1849_07396, pp. 2-3.
[269] Ex. C-0093, pp. 4, 39.
[270] Ex. C-0096, p. 13; the Tribunal notes that the same document offers different ranges for the reforecast at p. 17.
[271] Ex. C-0257, p. 4.
[272] Ex. C-0113.
[273] Ex. C-0110, p. 5.
[274] Ex. C-0056, tab "Project Summ Cost Report Only", Cell R62 ("TOTAL"); see also LI ER, para. 1180 and Table 9.4-17 therein; see also Attachment 9-02 to LI ER.
[275] CPHB, para. 1, citing to Long International ER, para. 1180 and Table 9.4-17.
[276] CPHB, para. 1, fn. 10. The Tribunal notes that CB&I does not quantify its counterclaim as a total number in USD but instead uses separate numbers for invoices due under the Onshore Contract, in Colombian pesos, and for those under the Offshore Contract, in USD.

Ultimate completion of Works

282. The EPC Contract stipulated that CB&I would complete the works by the guaranteed date of February 2013; it contains provisions for possible extensions of this deadline, but there is no agreement between the Parties as to their application in the current case.

283. Apart from the discussion on the extension of this deadline, the Parties also dispute when the Works were actually completed by CB&I; CB&I says this happened in February 2015[277] and Reficar says that it occurred when CB&I demobilised from the Project site in the fall of 2015[278]. The Parties likewise bring a number of arguments as to the reasons of the delay. Regardless of these arguments, however, it is clear that the Works were completed no earlier than two years after the date guaranteed by CB&I in the Contract.

284. It is finally undisputed that Reficar paid its other contractors for performing at least some of the completion and minor corrective Works that were initially in the scope of work of CB&I. The Parties dispute whether CB&I should reimburse Reficar for these costs as well.

285. There is no dispute between the Parties that Reficar now operates a state-of-the-art refinery.

* * *

286. On the basis of the above facts, Reficar, in essence, brings pre-contractual claims.

[277] RPHB, paras. 172, 176.
[278] CPHB, paras. 134-135, citing to LI ER, para. 37.

VI. RELIEF SOUGHT

287. In the following sections, the Arbitral Tribunal reproduces the Parties' requests for relief as described in the Terms of Reference (**1.**), main submissions (**2.**) and Post-Hearing Briefs (**3.**). Finally, the Tribunal will transform the Parties' requests for relief into blended requests for relief (**4.**).

1. TERMS OF REFERENCE

288. In the Terms of Reference, Reficar requested the Tribunal an award containing the following declarations or remedies[279]:

> "a. A declaration that Reficar is entitled to reimbursement or restitution of all costs paid by Reficar which were unreasonably and improperly incurred by Respondents in connection with the work on the Project, and that Reficar is not obligated to pay to Respondents any additional such costs which it has not already paid.
>
> b. A declaration that Respondents breached their fiduciary duties as well as the good-faith and other *deberes secundarios de conducta* to Reficar in connection with their work on the Project.
>
> c. A declaration that Respondents committed fraud and/or *dolo* both in inducing Reficar to enter into the EPC Contract and in connection with their work on the Project.
>
> d. A declaration that Respondents breached the EPC Contract by virtue of their fraud, *dolo*, gross negligence and/or willful misconduct.
>
> e. A declaration that Respondents were negligent, grossly negligent, fraudulent, and/or acted *dolosamente* in preparing the estimates concerning the EPC Contract and in connection with their Work on the Project, both before and after execution of the EPC Contract, fully knowing or that they should have known that those estimates were inaccurate.
>
> f. A declaration that Respondents were negligent, grossly negligent, fraudulent, and/or acted *dolosamente* in preparing the EPC Contract schedules and in connection with their work on the Project, both before and after execution of the EPC Contract, fully knowing or that they should have known that those schedules were inaccurate, including the baseline schedule provided to Reficar before execution of the EPC Contract.
>
> g. A declaration that Respondents engaged in willful misconduct and/or *dolo* in preparing the estimates concerning the EPC Contract and in connection with their work on the Project.

[279] TofR, para. 37.

h. A declaration that Respondents engaged in willful misconduct and/or *dolo* in preparing the schedules concerning the EPC Contract and in connection with their work on the Project.

i. A declaration that Respondents were negligent, grossly negligent, fraudulent, and/or acted *dolosamente* in their failure to manage the labor force and that Respondents are responsible for costs arising out of the labor disruptions.

j. A declaration that, due to Respondents' conduct, Respondents cannot avail themselves of any limitation-of-liability provisions in any contract (including TC 8 of the EPC Contract) to limit Reficar's damages because they are unenforceable, abusive, inapplicable, and/or null and void.

k. A declaration that Respondents are fully responsible for any judgment or decision by Colombian courts or any other governmental entity against Reficar or its employees due to CBI's negligence, *dolo*, gross negligence, and/or willful misconduct with respect to Colombian public funds.

l. A declaration that Respondents shall indemnify Reficar for any payment or cost that any governmental entity may order under Colombian law due to CBI's negligence, *dolo*, gross negligence, and/or willful misconduct with respect to Colombian public funds.

m. A declaration that Respondents are fully responsible under their respective Project Agreements to Reficar – including, but not limited to, [CB&I N.V.]'s[280] obligations under the Performance Guarantees.

n. A declaration that Respondents are required to turn over and provide to Reficar all necessary documents for the completion and safe operation of the Refinery, including without limitation documents necessary to achieve contractual Mechanical Completion, QA/QC records, and subcontract records.

o. A declaration that the Letter of Credit issued pursuant to TC 75.3 of the EPC Agreement secures prior payments made by Reficar pursuant to the parties' Memorandum of Agreement and Project Invoicing Procedure and may be used to recover any such payments that are not justified and properly substantiated by CBI (by further declaration of the Tribunal).

p. An award of all actual damages, including additional Owner's costs and lost profits, of an amount of not less than USD 2 billion, based on the facts and legal grounds expressed herein and in any subsequent submissions. Reficar reserves the right to quantify at a later date the damages it has suffered, including lost profits.

q. An award of equitable relief based on the facts and legal grounds expressed herein and in any subsequent filings, including disgorgement of all revenues, fees, and profits.

[280] The TofR appears to contain a typographical mistake as it refers to "CBI NL". The Tribunal understands reference to be made to "CB&I N.V.".

r. An award of pre- and post-award interest at the applicable rates under applicable law until the effective payment of the award".

289. On the other hand, CB&I requested the Tribunal an award containing the following declarations or remedies[281]:

"a. A declaration that the Claimant's claims are dismissed in their entirety.

b. A declaration that the Claimant breached the applicable agreements.

c. A declaration that the Claimant abused its rights, acted in bad faith, and failed to comply with its duties under the Project Agreements and at law.

d. A declaration that the Claimant is liable for interference in the Respondents' contractual relationships with its subcontractors, laborers, employees, and banks, in breach of its duty of good faith to the Respondents, as well as at law.

e. A declaration that the Claimant has been unjustly enriched.

f. A declaration that the Respondents have no liability to the Claimant under any Performance Guarantee.

g. A declaration that the Advance Payment LC no longer secures money the Claimant paid to the Respondents in advance of the Respondents performing the obligations under the relevant agreements to which such money relates and the Claimant has no right to make a demand or draw upon the Advance Payment LC.

h. A declaration that Respondents satisfied Contractor's obligations and liabilities under the applicable agreements and the Claimant is liable to the Respondents for fraudulently drawing on the Performance LC.

i. A declaration that the Respondents are entitled to reimbursement for costs and expenses incurred in responding to the Colombian government investigations of the Claimant.

j. A declaration that the Claimant is obligated to pay all costs, expenses, fines or penalties that the Respondents incur in responding to Colombian government investigations of Ecopetrol, the Claimant, or their employees, agents, officers, shareholders, directors, or representatives.

k. A declaration that the Claimant is not entitled to recover sums paid under the Project Invoicing Procedures or the Memoranda of Understanding.

l. A declaration that the Respondents are entitled to the award of all actual damages, other sums, and/or set-offs based on the allegations in their Counterclaim.

[281] TofR, para. 106.

m. A declaration that the Respondents are entitled to be awarded their legal fees, expert fees, and costs of the Arbitration per the ICC Rules, the Project Agreements, and applicable law.

n. A declaration that the Tribunal's decision on any claim for an item of costs or any class of cost items that has been made or could have been made in this arbitration is final and binding for all purposes.

o. In the alternative, a declaration that the Project Agreements' economic balance has been unfairly affected to the Respondents' detriment and must be established by enforcing the Project Agreement or Project Agreements, as the case may be.

p. A declaration that the Respondents are entitled to be awarded pre- and post-judgment interest and all other interest payable under applicable law and/or the DRA".

2. MAIN SUBMISSIONS

290. In this section, the Arbitral Tribunal will reproduce the Parties' requests for relief for the Claim (**A.**) and the Counterclaim (**B.**).

A. Claim

a. Claimant's Request for Relief

291. In the Reply, Claimant requested the Arbitral Tribunal to issue an award containing the following declarations, relief or remedies[282]:

1. A declaration that the burden of proof on Reficar's affirmative claims is shifted in whole or in part to CB&I for the reasons set forth in Section VI(C)(1), *supra*.

2. A declaration that Reficar is entitled to reimbursement or restitution of all costs paid by Reficar which were unreasonably and improperly incurred by Respondents in connection with the Work on the Project, and that Reficar is not obligated to pay to Respondents any additional such costs which it has not already paid.

3. A declaration that Respondents committed *dolo incidental* and/or violated the duty to inform during negotiations over the EPC Agreement and/or otherwise failed to negotiate the EPC Agreement in good faith.

4. A declaration that Respondents violated the duty to inform under Colombian law with respect to the character and accuracy of Respondent's pre-contract estimates.

[282] Reply, para. 1021. The Tribunal notes that Reficar also filed an Updated Statement of Claim Amounts on March 12, 2021, but that this update only affected the numbers and not the character of the requests for relief.

5. A declaration that Respondents violated the duty to inform under Colombian law with respect to the character and accuracy of Respondent's pre-contract schedules.

6. A declaration that Respondents' violation of the duty to inform resulted in Reficar accepting contract terms in the EPC Agreement without full knowledge, which Reficar would not have accepted but for Respondents' failure to inform, and thus such terms shall not be applied to or enforced against Reficar, including but not limited to TC 8.1, TC 8.2.1, and TC 54.8.

7. A declaration that Respondents breached their good faith and fiduciary obligations to Reficar in connection with their Work on the Project.

8. A declaration that Respondents committed fraud, *dolo*, and/or willful misconduct in connection with their Work on the Project.

9. A declaration that Respondents committed gross negligence or *culpa grave* in connection with their Work on the Project.

10. A declaration that Respondents breached the EPC Agreement by virtue of their fraud, *dolo*, *culpa grave*, Gross Negligence and/or Willful Misconduct.

11. A declaration that Respondents were negligent, grossly negligent, fraudulent, and/or acted with *dolo* and/or *culpa grave* in preparing the estimates concerning the EPC Agreement and in connection with their Work on the Project, both before and after execution of the EPC Agreement, fully knowing or that they should have known that those estimates were inaccurate and unreliable.

12. A declaration that Respondents were negligent, grossly negligent, fraudulent, and/or acted with *dolo* and/or *culpa grave* in preparing the EPC Agreement schedules and in connection with their Work on the Project, both before and after execution of the EPC Agreement, fully knowing or that they should have known that those schedules were inaccurate or unreliable, including the baseline schedule provided to Reficar before execution of the EPC Agreement.

13. A declaration that Respondents engaged in gross negligence, *culpa grave*, *dolo*, fraud, and/or willful misconduct in preparing the estimates concerning the EPC Agreement and in connection with their Work on the Project.

14. A declaration that Respondents engaged in gross negligence, *culpa grave, dolo*, fraud, and/or willful misconduct in preparing the schedules concerning the EPC Agreement and in connection with their Work on the Project.

15. A declaration that Respondents not only committed willful misconduct, *dolo*, gross negligence, and/or *culpa grave* through violations of the EPC Agreement, but that the aggregate, extended duration of the harm Respondents caused also constituted willful misconduct, *dolo*, gross negligence, and/or *culpa grave*.

16. A declaration that, due to Respondents' conduct, Respondents cannot avail themselves of any limitation-of-liability provisions in any contract (including TC 8, TC 54, and TC 56 of the EPC Agreement) to limit Reficar's damages because they are unenforceable, inapplicable, and/or null and void.

17. A declaration that Respondents are not entitled to payment from Reficar for invoices that did not comply with the requirements of the EPC Agreement.

18. A declaration that Respondents must reimburse Reficar for payments that Reficar made under invoices that did not comply with the requirements of the EPC Agreement.

19. A declaration that Respondents must fully indemnify Reficar for any judgment or decision by Colombian courts or any other governmental entity against the Owner Group that was caused by CB&I's violation of any applicable laws, including violations that constitute fraud, negligence, *dolo*, gross negligence, *culpa grave*, and/or willful misconduct.

20. A declaration that Respondents shall indemnify Reficar for any payment or cost that any governmental entity may order against the Owner Group under Colombian law due to CB&I's violation of any applicable laws, including violations that constitute fraud, negligence, *dolo*, gross negligence, *culpa grave*, and/or willful misconduct with respect to Colombian public funds.

21. A declaration that Respondents are fully responsible under any Project Agreement—including, but not limited to, CB&I N.V.'s obligations under the Contractor Performance Guarantees.

22. An award of all actual damages, including additional Owner's costs, lost profits, and cost of capital, based on the facts and legal grounds expressed herein and in any previous or subsequent submissions.

23. An award of *daño emergente* for Improper EPC Costs of US$ 2,317.87 million resulting from Respondents' negotiation-phase misconduct, which is comprised of (i) US$ 364.53 million arising from CB&I's understatement of costs in its allegedly Class 2 +/- 10% estimate and (ii) US$ 1,953.34 million in configuration-of-the-contract damages.

24. In the alternative to Request 23, an award of damages/*daño emergente* for Improper EPC Costs of US$ 2,001.58 million resulting from (i) Respondents' breach of the EPC Agreement through gross negligence, *culpa grave*, willful misconduct, fraud, bad faith, or *dolo*; (ii) Respondents' breach of their fiduciary duties; and/or (iii) Respondents breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap due to Respondents' breach of the duty to inform during negotiations or for any other reason set forth herein.

25. In the alternative to Requests 23 and 24, an award of US$ 1,807.89 million for reimbursement of costs paid under the EPC Agreement that were not reasonably or properly incurred in accordance with the terms of the EPC Agreement.

26. An award of US$ 165.35 million for increased Owner's costs as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa grave*, willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.

27. An award of US$ 173.80 million for increased PCS costs as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa grave*, willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.

28. An award of US$ 569.11 million for cost of capital related to improper EPC costs, Owner's costs, and PCS costs as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa grave,* willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.

29. In the alternative to Request 28, an award of US$ 457.91 million for cost of capital related to unreasonable and improper costs and/or unsubstantiated payments requested in Requests 25 and 33.

30. An award of Reficar's *lucro cesante*/lost profits of US$ 862.59 million for lost product sales as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa grave*, willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.

31. An award of Reficar's *lucro cesante*/lost profits of US$ 397.05 million for cost of capital on lost profits as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa grave*, willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.

32. An award of Reficar's *lucro cesante*/lost profits of US$ 12.24 million for lost revenues on electricity sales as a result of (i) Respondents' negotiation-phase misconduct; (ii) Respondents' gross negligence, *culpa*

> *grave*, willful misconduct, fraud, bad faith, or *dolo* in violation of the EPC Agreement; (iii) Respondents' breach of the EPC Agreement and the invalidity/inapplicability of the Liability Cap; and/or (iv) Respondents' breach of their fiduciary duties.
>
> 33. An award of US$ 137.25 million for payments that were made by Reficar pursuant to the MOA, PIP, or EPC Agreement but never subsequently substantiated by Respondents, or, if the Tribunal awards an amount request pursuant to Requests 23-25, an alternative award of US$ $74.72 million to avoid duplication.
>
> 34. An award of US$ 8.74 million resulting from Respondents' misconduct with respect to vendor back-charges.
>
> 35. An award of US$ 3.51 million related to Reficar's inability to collect these owed amounts from Aceral due to CB&I's breaches and failures.
>
> 36. An award of disgorgement of Respondents' profits and fees of at least US$ 225 million.
>
> 37. A declaration that Tribunal will draw an adverse inference in favor of Reficar with respect to documents that CB&I failed to produce or disclose in this arbitration, as more fully discussed in Section VI(C)(2) *supra*.
>
> 38. An award of equitable relief based on the facts and legal grounds expressed herein and in any subsequent filings.
>
> 39. An award of costs of the arbitration, including attorneys' fees.
>
> 40. An award of pre- and post-award interest, at the applicable rates under applicable law, until the effective date of payment of the award.

292. Reficar also requested the Tribunal to issue a declaration liquidating the EPC Agreement and establishing the appropriate EPC Agreement value[283].

b. <u>Respondents' Request for Relief</u>

293. In its ESOD, Respondents' request for relief with regard to the Claim is as follows[284]:

> [1] a. A declaration that Reficar is not entitled to any monetary damages or declaratory relief, including, but not limited to, the monetary damages and declaratory relief requested in Reficar's Request for Arbitration and Exhaustive Statement of Claim.
>
> [2] b. An award to CB&I of monetary damages and other relief requested in its Answer to Request for Arbitration and Counterclaim, Non-Exhaustive

[283] Reply, para. 1022.
[284] ESOD, para. 1612. The Tribunal has numbered the different requests for relief for ease of reference in the following sections.

Statement of Counterclaim, Exhaustive Statement of Counterclaim, and Reply to the Non-Exhaustive Statement of Defense to Counterclaim.

[3] c. A declaration that Reficar's claims are dismissed in their entirety.

[4] d. A declaration that Reficar breached its duties under the EPC Contract.

[5] e. A declaration that CB&I has no liability to Reficar under any Performance Guarantee.

[6] f. A declaration that Reficar acted in bad faith and breached its duty of good faith by inducing CB&I to continue working on the Project by paying CB&I's invoices with the intent of breaching its contractual obligations and forcing CB&I to return billions of dollars when the work was completed.

[7] g. A declaration that Reficar abused its rights, acted in bad faith, and breached the duty of good faith by interfering with CB&I's desired means and methods, failing to properly plan and implement procurement activities, and making decisions that were not in the best interest of the Project.

[8] h. A declaration that Reficar is contractually liable to CB&I for abusing its rights and/or intentionally breaching its obligation to pay invoices to CB&I that are due and owing.

[9] i. A declaration that Reficar is contractually liable to CB&I for abusing its rights and/or intentionally breaching its obligation to approve valid subcontractor change orders.

[10] j. A declaration that Reficar is liable for tortious interference in CB&I's contractual relationships with its subcontractors, laborers, employees, and banks.

[11] k. A declaration that Reficar has been unjustly enriched.

[12] l. A declaration that the EPC Contract's Limitation of Liability provisions and other caps on liability or damages are enforceable under any applicable laws.

[13] m. A declaration that all waivers of damages in the EPC Contract are enforceable under any applicable laws.

[14] n. A declaration that Reficar finally approved payment of all amounts tendered to CB&I and Reficar waived its rights to claw back those payments under the EPC Contract and applicable law.

[15] o. A declaration that Reficar is not entitled to restitution in any form.

[16] p. A declaration that CB&I does not owe Reficar any defense or indemnity under the EPC Contract or applicable law.

[17] q. A declaration that Reficar owes CB&I such defense and indemnity as is required by the EPC Contract or applicable law.

[18] r. A declaration that Reficar's potential damages for late completion of the Work are capped by the Delay Liquidated Damages provisions in the EPC Contract.

[19] s. A declaration that Reficar cannot and shall not offset its prior payments to CB&I against sums that are due and owing to CB&I, and CB&I is not obligated to return any sums it received from Reficar for the Work.

[20] t. A declaration that CB&I has no liability under the Advance Payment LC.

[21] u. A declaration that Reficar fraudulently attempted to draw on the Advance Payment LC.

[22] v. A declaration that Reficar has no right to make a demand or draw upon the Advance Payment LC.

[23] w. A declaration that the Adavance Payment LC does not secure payments made by Reficar to CB&I under the MOA or PIP.

[24] x. A declaration that CB&I has no liability under the Performance LC.

[25] y. A declaration that Reficar is liable to CB&I for improperly drawing on the Performance LC.

[26] z. A declaration that the EPC Contract is a valid and binding agreement on the parties, is still in full force and effect, and Reficar must reimburse CB&I for all reasonable and proper costs it incurs until the EPC Contract is liquidated.

[27] aa. A declaration that all costs CB&I incurred in performing Work under the EPC Contract are reasonable and proper.

[28] bb. A declaration that CB&I adequately performed its obligations under the EPC Contract and is not liable for fraud, gross negligence, willful misconduct, *dolo*, *culpa grave*, or *fraude*.

[29] cc. A declaration that CB&I did not improperly or fraudulently induce Reficar to execute the EPC Contract.

[30] dd. A declaration that CB&I did not improperly or fraudulently induce Reficar to agree to fabricate pipe rack modules in the United States.

[31] ee. A declaration that Reficar maliciously withheld payments from CB&I, refused to sign change orders, and induced CB&I to continue working on the Project, without intending to honor its payment obligations.

[32] ff. A declaration that CB&I is entitled to reimbursement for costs and expenses incurred in responding to the Colombian government investigations of Reficar.

[33] gg. A declaration that Reficar is obligated to pay all costs, expenses, fines, or penalties that CB&I incurs in responding to the Colombian government investigations of Ecopetrol, Reficar, or their employees and representatives.

[34] hh. A declaration that CB&I is entitled to be awarded its legal fees, expert fees, and costs of this Arbitration.

[35] ii. A declaration that CB&I is entitled to be awarded pre- and post-judgment interest and all other interest payable under applicable law.

[36] jj. A declaration that CB&I is entitled to amounts necessary to compensate it for fluctuations in the exchange rate of the COP caused by Reficar's failure to timely pay amounts due and owing.

[37] kk. In the alternative, a declaration that the EPC Contract's economic balance has been unfairly impacted to CB&I's detriment and must be established by enforcing the EPC Contract.

B. Counterclaim

a. Respondents' Request for Relief

294. Pursuant to para. 4162 of the Respondents' Reply on Counterclaim[285], Respondents' requests for relief with regard to the Counterclaim are as follows:

a. CB&I is entitled to monetary damages in the amount of approximately USD 37,886,998 and COP 503,241,225,913, inclusive of interest, for costs incurred in performance of the Work.

b. CB&I is entitled to monetary damages in the amount of USD 70 million, plus interest, as a result of Reficar's wrongful actions in connection with the Performance LC.

c. CB&I is entitled to its legal costs and expenses as a result of Reficar's wrongful actions in connection with Reficar's improper demands on the Performance LC and Advance Payment LC.

d. CB&I is entitled to pre- and post-judgment interest per TC 58.12 of the EPC Contract. In the case of U.S. dollars, interest shall be awarded at a rate of LIBOR plus 2%. In the case of Colombian pesos, interest shall be awarded at a rate of DTF plus 2%. Interest shall be compounded daily.

e. CB&I is entitled to amounts necessary to compensate it for fluctuations in the exchange rate of the COP caused by Reficar's failure to timely pay amounts due and owing.

f. CB&I is entitled to its attorneys' fees for this matter and all arbitration costs allowed by the ICC rules, including the fees and expenses of the arbitrators and the ICC administrative expenses fixed by the Court, in accordance with the scale in force at the time of the commencement of the arbitration, as well as the fees and expenses of any experts appointed by the Arbitral Tribunal, the

[285] Respondents' Reply on Counterclaim, para. 162.

costs of CB&I's own experts, translation costs and the reasonable legal and other costs incurred by CB&I for the arbitration.

g. CB&I is entitled to the following declaratory relief:

i. A declaration that Reficar breached its obligations under the EPC Contract;

ii. A declaration that Reficar acted in bad faith and breached its contractual and implied duties of good faith to CB&I;

iii. A declaration that Reficar abused its rights to CB&I's detriment;

iv. A declaration that CB&I does not owe Reficar any further monies;

v. A declaration that Reficar cannot and shall not offset its prior payments to CB&I against sums that are due and owing to CB&I, and CB&I is not obligated to return any sums it received from Reficar for the Work;

vi. A declaration that the Advance Payment LC does not secure payments made by Reficar to CB&I under the MOA or PIP;

vii. A declaration that CB&I has no liability under the Advance Payment LC;

viii. A declaration that Reficar has no right to make a demand or draw upon the Advance Payment LC;

ix. A declaration that CB&I has satisfied its obligations and liabilities under the applicable agreements and, therefore, has no liability to Reficar under the Performance LC;

x. A declaration that Reficar wrongfully drew on the Performance LC;

xi. A declaration that Reficar is required to reimburse CB&I for any costs, including labor costs, that CB&I is currently obligated to pay, or may become obligated to pay in the future, under the EPC Contract or Colombian law;

xii. A declaration that Reficar is obligated to pay all costs, expenses, fines, or penalties that the CB&I has incurred, or may incur in the future, in responding to Colombian government investigations; and

xiii. A declaration that CB&I is entitled to be awarded pre- and post-judgment interest and all interest payable under applicable law.

h. CB&I is entitled to any other relief that the Arbitral Tribunal deems just and proper.

i. CB&I reserves its right to seek any and all additional relief to which it may be entitled.

j. CB&I hereby incorporates all claims for relief contained within its Exhaustive Statement of Defense.

b. Claimant's Request for Relief

295. In its ESODCC, Reficar requested the Tribunal to reject CB&I's requests for relief and to issue an award as follows[286]:

a. CB&I is not entitled to any further payments under the Onshore or Offshore Contracts;

b. CB&I should refund to Reficar US$ 137,253,916 in advance payments Reficar made to CB&I for invoices that did not qualify for reimbursement under the EPC Agreement, including payments made under the MOA and PIP;

c. CB&I is not entitled to any reimbursement, return of monies, damages, legal costs or fees in connection with Reficar's proper draw on the Performance LOC or proper attempt to draw on the Advance Payment LOC;

d. CB&I is not entitled to its attorneys' fees or arbitration costs in connection with its claims and is to pay Reficar's attorneys' fees and arbitration costs to the extent allowed by ICC rules;

e. CB&I's requests for declaratory relief are denied and Reficar is entitled to the following declaratory relief:

i. A declaration that CB&I breached its obligations under the EPC Agreement, including in particular its obligation to submit invoiced costs that were reasonably and properly incurred by CB&I in accordance with the EPC Agreement, and its obligation to provide information requested to facilitate Reficar's review of invoices;

ii. A declaration that Reficar properly offset invoice amounts that were due and owing by use of disputed invoices that were not due and owing because those invoices had been properly rejected;

iii. A declaration that payments Reficar made under the MOA and PIP qualify as advance payments under TC 75.3.1 and are not subject to the cap on liability in TC 8.1.1.

iv. A declaration that Reficar has the right to make a demand and draw on the Advance Payment LOC in an amount of up to US$ 95 million for the US$ 17,524,902.11 in forecast payments CB&I has retained, plus the total amount of disputed invoices paid under the MOA and PIP that did not comply with the reimbursement requirements of the EPC Agreement and Colombian fiscal responsibility laws;

v. A declaration that Reficar properly drew on the Performance LOC;

vi. A declaration that Reficar is entitled to pre- and post-judgment interest in connection with any amount Reficar paid to CB&I that did

[286] ESODCC, para. 376.

not comply with the reimbursement requirements of the EPC Agreement and Colombian fiscal responsibility laws;

vii. A declaration that CB&I is obligated to pay all costs, expenses, fines, or penalties that Reficar has incurred or may incur in the future in connection with any investigations or proceedings by the *Contraloría*, the Colombian government or any other governmental authority wherever located, that arise out of the events at issue in this arbitration.

3. POST-HEARING BRIEFS

296. Pursuant to the CPHB, Reficar asks the following with regard to its Claim[287]:

1. A declaration that the burden of proof rests with CB&I with respect to the issues set forth in paragraph 1016 of Reficar's Reply due to, among other reasons, the reasons set forth in paragraphs 1003-1015 of Reficar's Reply and paragraphs 136-144 of Claimant's First PHB.

2. A declaration that Tribunal will draw adverse inferences against CB&I as requested and for the reasons set forth at paragraphs 5, 528-538, 572, 577, 581, and 660 of Reficar's SOC and paragraphs 1017-1019 of Reficar's Reply.

3. A declaration that CB&I committed *dolo* incidental and/or violated the duty of good faith, including the duty to inform, during negotiations over the EPC Agreement (hereinafter, "Pre-contract Misconduct").

4. A declaration that CB&I committed Pre-Contract Misconduct with respect to its recommendation to switch the EPC Contract from a LSTK structure to a cost-reimbursable structure.

5. A declaration that CB&I committed Pre-Contract Misconduct with respect to the character and accuracy of CB&I's pre-contract estimates.

6. A declaration that CB&I committed Pre-Contract Misconduct with respect to the character and accuracy of CB&I's pre-contract schedules.

7. A declaration that CB&I's Pre-Contract Misconduct resulted in Reficar accepting contract terms in the EPC Agreement that it would not otherwise have accepted, and thus such terms shall not be applied to or enforced against Reficar, including but not limited to TC 8.1, TC 8.2.1, TC 54.8, TC 56, and any other limitations of liability in the EPC Contract (hereinafter, "Limitations of Liability").

8. A declaration that CB&I must reimburse Reficar for costs paid by Reficar to CB&I that were not reasonably and properly incurred in accordance with the EPC Agreement, and that such reimbursement is not limited by any Limitations of Liability (hereinafter, "Reimbursement Obligation").

[287] CPHB, para. 532.

9. A declaration that CB&I breached the EPC Agreement during the execution phase through gross negligence, culpa grave, wilful misconduct, fraud, bad faith, and/or *dolo* (hereinafter, "Contractual *Dolo*").

10. A declaration that, regardless of the existence of Contractual *Dolo*, Reficar is entitled to recover all damages arising from CB&I simple breach of the EPC Agreement during the execution phase because the Limitations of Liability are invalid/inapplicable due to CB&I's Pre-Contract Misconduct or for any other reason set forth in Reficar's briefing (hereinafter, "Inapplicability of Limitations of Liability").

11. A declaration that CB&I breached its good faith and fiduciary obligations to Reficar in connection with its Work on the Project (hereinafter, "Fiduciary Breach").

12. A declaration that CB&I not only committed wilful misconduct, *dolo*, gross negligence, and/or culpa grave through violations of the EPC Agreement, but that the aggregate, extended duration of the harm CB&I caused also constituted wilful misconduct, *dolo*, gross negligence, and/or *culpa grave*.

13. A declaration that CB&I is not entitled to payment from Reficar for invoices that did not comply with the requirements of the EPC Agreement.

14. A declaration that CB&I must reimburse Reficar for payments that Reficar made under invoices that did not comply with the requirements of the EPC Agreement.

15. A declaration that Reficar is not obligated to pay to CB&I any additional costs which it has not already paid.

16. A declaration that Reficar properly drew on the Performance Letter of Credit and is not obligated to return any of those funds.

17. A declaration that the Unsubstantiated Advance Payment Amount is in excess of US$ 95 million and that Reficar is entitled to draw on the full amount of the AP Letter of Credit.

18. A declaration that CB&I must fully indemnify Reficar for any judgment or decision by Colombian courts or any other governmental entity against the Owner Group that was caused by CB&I's violation of any applicable laws.

19. A declaration that CB&I is obligated to continue to indemnify and defend Reficar for and from claims pending in Colombian courts presented by workers hired by CB&I during the project.

20. A declaration that CB&I UK and CBI Colombiana are jointly and severally liable for all obligations declared and amounts awarded herein pursuant to the parties' Section 18 and other provisions of the Parties' Coordination Agreement as well as applicable law.

21. A declaration that CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded herein pursuant to the Parent Guarantee Agreements.

22. An award of all actual damages, including additional Owner's costs, lost profits, and cost of capital, based on the facts and legal grounds expressed in any of Claimant's submissions.

23. A specific award of US$ 363,550,178 for understated quantities and deliverables in the Final Full Estimate (Claim Category 1A) based on CB&I's Pre-contract Misconduct.

24. A specific award of US$ 361,026,237 for the understated productivity multiplier in the Final Full Estimate (Claim Category 1B) based on CB&I's Pre-contract Misconduct or, in the alternative, US$ 307,141,724 if the Tribunal decides to credit the final multiplier adjustment in CB&I's favour.

25. A specific award of US$ 102,392,722 for Engineering Productivity Failures (Claim Category 2) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

26. A specific award of US$ 30,737,257 for Steel Fabrication Failures (Claim Category 3) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

27. A specific award of US$ 103,445,504 for Pipe Spool Fabrication Failures (Claim Category 4) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

28. A specific award of US$ 4,400,000 for Substation Failures (Claim Category 5) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

29. A specific award of US$ 3,340,806 for Invensys Automation Failures (Claim Category 6) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

30. A specific award of US$ 48,814,969 for Labor Disruption Failures (Claim Category 7) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

31. A specific award of US$ 81,530,521 for Labor Strike Failures (Claim Category 8) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

32. In the alternative to Request 24 (Claim Category 1B), a specific award of US$ 284,335,307 for Non-Discrete Productivity Loss from CB&I Failures (Claim Category 9) based on (i) CB&I's Contractual *Dolo*, (ii) the

Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

33. A specific award of US$ 28,508,755 for Excessive Rework (Claim Category 10) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

34. A specific award of US$ 264,263,099 for Excessive CMT (Claim Category 11) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

35. In the alternative to the prior request, a specific award of US$ 268,503,387 for Excessive CMT (alternative Claim Category 11) based on CB&I's Reimbursement Obligation.

36. A specific award of US$ 69,906,599 for Excessive Scaffolding (Claim Category 12) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

37. In the alternative to the prior request, a specific award of US$ 61,128,009 for Excessive Scaffolding (alternative Claim Category 12) based on CB&I's Reimbursement Obligation.

38. A specific award of US$ 8,739,885 for Unresolved Back-charges (Claim Category 13) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

39. A specific award of US$ 20,062,560 for Island Park Productivity Failures (Claim Category 14) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

40. A specific award of US$ 42,683,951 for EPC Labor Escalation Due to CB&I Failures (Claim Category 15) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

41. A specific award of US$ 688,755,958 for EPC Prolongation Due to CB&I Failures (Claim Category 16) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

42. In the alternative to the prior request, a specific award of US$ 652,116,799 for EPC Prolongation Due to CB&I Failures (alternative Claim Category 16) based on CB&I's Reimbursement Obligation.

43. A specific award of US$ 165,345,825 for Owner's Delay Costs Due to CB&I Failures (Claim Category 17) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

44. A specific award of US$ 109,883,718 for PCS Delay Costs Due to CB&I Failures (Claim Category 18) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

45. A specific award of US$ 1,615,527 for PCS Completion of Outstanding and Incomplete Work (Claim Category 19) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

46. A specific award of US$ 8,692,212 for PCS Correction of Defective Work (Claim Category 20) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

47. A specific award of US$ 10,318,811 for PCS Specific Impacts on Contractors Due to CB&I Failures (Claim Category 21) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

48. A specific award of US$ 42,586,609 for PCS Labor Productivity Loss (Claim Category 22) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

49. A specific award of Cost of Capital (Claim Category 23) on the Improper Costs awarded above calculated based on the date of the Tribunal's award and Reficar's 8.6% WACC, or in the alternative, by applying the contractual interest rate for late payments of LIBOR + 2%. (Based on the calculations of Breakwater Forensics, those cost of capital amounts on Reficar's execution-phase damages as of 10-May-2019 were US$ 382,803,640 and US$ 220,009,151 for the two interest rate options.)

50. A specific award of US$ 809,813,402 for Loss Profits (Claim Category 24) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach, with an offset/credit of (US$22,926,290) due to the extended life of the Refinery.

51. A specific award of US$ 325,007,417 for Cost of Capital on Loss Profits (Claim Category 25) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

52. A specific award of $12,235,789 for Lost Revenue from Electricity Sales (Claim Category 26) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

53. A specific award of US$ 140,265,957 for Unsubstantiated Advance Payments (Claim Category 27) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, (iv) CB&I's Reimbursement Obligation, and/or (v) CB&I's failure to

substantiate invoices as required by the EPC Agreement, MOA, and PIP. However, to avoid duplication, this amount should be reduced by ratio of Improper EPC Costs awarded with respect to Requests 25 through 42 above in comparison to the total amounts paid directly to CB&I (US$ 3,967.38 million). For example, if the Tribunal awards US$ 1,590.08 million pursuant to the identified Requests, the US$ 140,265,957 amount should be reduced by 40.08% ($1,590.08/$3,967.38) to US$ 84.047 million.

54. A specific award of disgorgement of CB&I's profits and fees of at least US$ 225,000,000 (Claim Category 28) based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

55. In the alternative to Requests 43, 44, 50, 51, and 52 above (Delay Claim Categories Other than EPC Costs), a specific award of US$ 366,250,000 for Liquidated Damages for Delay based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.

56. In the alternative to Requests 25 through 42 above (Top-Down Claim Categories), an award of US$ 1,945.96 million in Improper EPC Costs as calculated in Long International's alternative Bottom-Up Methodology based on (i) CB&I's Contractual *Dolo*, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.

57. An award of equitable relief based on the facts and legal grounds expressed herein and in any prior filings.

58. An award of costs of the arbitration, including attorneys' fees.

59. An award of post-award interest, at the applicable rates under applicable law, until the effective date of payment of the award.

60. A declaration that the Tribunal has Liquidated the EPC Agreement and established the appropriate EPC Agreement value pursuant to its awards and declarations above.

61. Reficar also seeks any and all additional relief that the Tribunal may deem appropriate.

297. Pursuant to the RPHB, CB&I requests the Tribunal to issue an award containing the relief listed in the ESOD (para. 293 *supra*) under requests no. 1-9 and 11-37, in the Respondents' Reply on Counterclaim (para. 294 *supra*) and the following relief[288]:

a. An award of monetary damages of USD 146,964,022 under the Offshore Contract and COP 568,229,695,037 under the Onshore Contract;[1501]

[288] RPHB, para. 675.

b. A declaration that CB&I does not owe Reficar for invoices Reficar previously paid, but subsequently failed or refused to "approve";

c. A declaration that neither Party has asserted a liquidated claim for indemnity, and any claims for indemnity asserted in this Arbitration are premature and not ripe for resolution;

d. A declaration that Reficar shall return the sum it improperly drew on the Performance LC to CB&I UK and pay all of CB&I's legal costs and expenses associated with legal challenges to Reficar's demands on the Performance LC and Advance Payment LC;

e. A declaration that CB&I did not breach a pre-contractual duty to act in good faith and/or act with pre-contractual *dolo*;

f. A declaration that (i) CB&I UK has demanded payment of amounts owed jointly and severally to CB&I UK and CBI Colombiana in this Arbitration, and (ii) requiring Reficar to pay CB&I UK any amounts awarded in this Arbitration that are owned jointly and severally to CB&I UK and CBI Colombiana as required by article 1570 of the Colombian Civil Code; and

g. A declaration pursuant to article 1570 of the Colombian Civil Code that amounts owed to CBI Colombiana under the Onshore Contract can be set-off between Reficar and CB&I UK based on CB&I UK's status as a joint and several creditor with CBI Colombiana.

4. BLENDED REQUESTS FOR RELIEF

298. As acknowledged by the Parties, many of Claimant's requests overlap with those of Respondents'[289]; furthermore, as a consequence of the Tribunal's findings, a significant number of requests will become moot – these requests are not specifically mentioned in the table below, but will be adjudicated in Section X.6 *infra*.

299. Once duplicative and moot requests are excluded[290], the approximately 100 individual requests can be subsumed into the following 14 blended requests for relief ["**Blended Requests for Relief**"][291]:

	Claimant's Relief	Submission	Respondents' Relief	Submission	Blended Request for Relief
1.	*3. A declaration that CB&I committed dolo incidental and/or violated the duty of good faith, including the duty to inform, during negotiations over the EPC*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[29] cc. A declaration that CB&I did not improperly or*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that CB&I committed pre-contract misconduct, breaching a pre-contractual duty to**

[289] Tr. 200:9; RPHB, para. 637.
[290] See section X.6 *infra*.
[291] The Tribunal will assume that, (i) if not mentioned in further requests for relief and (ii) not pleaded in the body of the Parties' main submissions, any other requests for relief have been waived by the Parties

	Agreement (hereinafter, "Pre-contract Misconduct"). *4. A declaration that CB&I committed Pre-Contract Misconduct with respect to its recommendation to switch the EPC Contract from a LSTK structure to a cost-reimbursable structure.* *5. A declaration that CB&I committed Pre-Contract Misconduct with respect to the character and accuracy of CB&I's pre-contract estimates.* *6. A declaration that CB&I committed Pre-Contract Misconduct with respect to the character and accuracy of CB&I's pre-contract schedules.* *7. A declaration that CB&I's Pre-Contract Misconduct resulted in Reficar accepting contract terms in the EPC Agreement that it would not otherwise have accepted, and thus such terms shall not be applied to or enforced against Reficar, including but not limited to TC 8.1, TC 8.2.1, TC 54.8, TC 56, and any other limitations of liability in the EPC Contract (hereinafter, "Limitations of Liability").* *10. A declaration that, regardless of the existence of Contractual Dolo, Reficar is entitled to recover all damages arising from CB&I simple breach of the EPC Agreement during the execution phase because the Limitations of Liability are invalid/inapplicable due to CB&I's Pre-Contract Misconduct or for any other reason set forth in Reficar's briefing (hereinafter, "Inapplicability of Limitations of Liability").* *23. A specific award of US$ 363,550,178 for understated quantities and deliverables in the Final Full Estimate (Claim Category 1A) based on CB&I's Pre-contract Misconduct.*		*fraudulently induce Reficar to execute the EPC Contract.*		**act in good faith and/or act with pre-contractual dolo and that CB&I is liable for damages.**
			e. A declaration that CB&I did not breach a pre-contractual duty to act in good faith and/or act with pre-contractual dolo.	RPHB, para. 675(3)(e)	

2.	*22. An award of all actual damages, including additional Owner's costs, lost profits, and cost of capital, based on the facts and legal grounds expressed in any of Claimant's submissions.* *44. A specific award of US$ 109,883,718 for PCS Delay Costs Due to CB&I Failures (Claim Category 18) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *47. A specific award of US$ 10,318,811 for PCS Specific Impacts on Contractors Due to CB&I Failures (Claim Category 21) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *48. A specific award of US$ 42,586,609 for PCS Labor Productivity Loss (Claim Category 22) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *50. A specific award of US$ 809,813,402 for Loss Profits (Claim Category 24) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach, with an offset/credit of (US$22,926,290) due to the extended life of the Refinery.* *51. A specific award of US$ 325,007,417 for Cost of Capital on Loss Profits (Claim Category 25) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[13] m. A declaration that all waivers of damages in the EPC Contract are enforceable under any applicable laws.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that the limitations in Section 4.13 of the DRA are enforceable.**
3.	*8. A declaration that CB&I must reimburse Reficar for costs paid by Reficar to CB&I that were not reasonably and properly incurred in accordance with the EPC Agreement, and that such reimbursement is not limited by any Limitations of Liability*	CPHB, para. 532	*[1] a. A declaration that Reficar is not entitled to any monetary damages or declaratory relief, including, but not limited to, the monetary damages and declaratory relief requested in Reficar's Request for Arbitration and*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that CB&I must reimburse Reficar USD 1,945.96 million for costs paid by Reficar to CB&I, in performing work,**

	(hereinafter, "Reimbursement Obligation"). *14. A declaration that CB&I must reimburse Reficar for payments that Reficar made under invoices that did not comply with the requirements of the EPC Agreement.* *25. A specific award of US$ 102,392,722 for Engineering Productivity Failures (Claim Category 2) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *26. A specific award of US$ 30,737,257 for Steel Fabrication Failures (Claim Category 3) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *27. A specific award of US$ 103,445,504 for Pipe Spool Fabrication Failures (Claim Category 4) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *28. A specific award of US$ 4,400,000 for Substation Failures (Claim Category 5) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *29. A specific award of US$ 3,340,806 for Invensys Automation Failures (Claim Category 6) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *30. A specific award of US$ 48,814,969 for Labor Disruption Failures (Claim Category 7) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or*		*Exhaustive Statement of Claim.* *[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[6] f. A declaration that Reficar acted in bad faith and breached its duty of good faith by inducing CB&I to continue working on the Project by paying CB&I's invoices with the intent of breaching its contractual obligations and forcing CB&I to return billions of dollars when the work was completed.* *[7] g. A declaration that Reficar abused its rights, acted in bad faith, and breached the duty of good faith by interfering with CB&I's desired means and methods, failing to properly plan and implement procurement activities, and making decisions that were not in the best interest of the Project.* *[9] i. A declaration that Reficar is contractually liable to CB&I for abusing its rights and/or intentionally breaching its obligation to approve valid subcontractor change orders.* *[10] j. A declaration that Reficar is liable for tortious interference in CB&I's contractual relationships with its subcontractors, laborers, employees, and banks.* *[14] n. A declaration that Reficar finally approved payment of all amounts tendered to CB&I and Reficar waived its rights to claw back those payments under the EPC Contract and applicable law.* *[15] o. A declaration that Reficar is not entitled to restitution in any form.* *[27] aa. A declaration that all costs CB&I incurred in performing Work under the EPC Contract are reasonable and proper.*		**that were not reasonably and properly incurred in accordance with the EPC Contract.**

	(iv) CB&I's Reimbursement Obligation. *31. A specific award of US$ 81,530,521 for Labor Strike Failures (Claim Category 8) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *32. In the alternative to Request 24 (Claim Category 1B), a specific award of US$ 284,335,307 for Non-Discrete Productivity Loss from CB&I Failures (Claim Category 9) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *33. A specific award of US$ 28,508,755 for Excessive Rework (Claim Category 10) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *34. A specific award of US$ 264,263,099 for Excessive CMT (Claim Category 11) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *35. In the alternative to the prior request, a specific award of US$ 268,503,387 for Excessive CMT (alternative Claim Category 11) based on CB&I's Reimbursement Obligation.* *36. A specific award of US$ 69,906,599 for Excessive Scaffolding (Claim Category 12) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *37. In the alternative to the prior request, a specific award of US$ 61,128,009 for Excessive Scaffolding (alternative Claim Category 12) based on CB&I's Reimbursement Obligation.*		*b. A declaration that CB&I does not owe Reficar for invoices Reficar previously paid, but subsequently failed or refused to "approve".*	RPHB, para. 675(3)(b)	

	38. A specific award of US$ 8,739,885 for Unresolved Back-charges (Claim Category 13) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach. *39. A specific award of US$ 20,062,560 for Island Park Productivity Failures (Claim Category 14) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *40. A specific award of US$ 42,683,951 for EPC Labor Escalation Due to CB&I Failures (Claim Category 15) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *41. A specific award of US$ 688,755,958 for EPC Prolongation Due to CB&I Failures (Claim Category 16) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *42. In the alternative to the prior request, a specific award of US$ 652,116,799 for EPC Prolongation Due to CB&I Failures (alternative Claim Category 16) based on CB&I's Reimbursement Obligation.* *53. A specific award of US$ 140,265,957 for Unsubstantiated Advance Payments (Claim Category 27) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, (iv) CB&I's Reimbursement Obligation, and/or (v) CB&I's failure to substantiate invoices as required by the EPC Agreement, MOA, and PIP. However, to avoid duplication, this amount should be reduced by ratio of Improper EPC Costs awarded with respect to Requests 25 through 42 above in comparison to the total amounts paid directly to*				

	CB&I (US$ 3,967.38 million). For example, if the Tribunal awards US$ 1,590.08 million pursuant to the identified Requests, the US$ 140,265,957 amount should be reduced by 40.08% ($1,590.08/$3,967.38) to US$ 84.047 million. *56. In the alternative to Requests 25 through 42 above (Top-Down Claim Categories), an award of US$ 1,945.96 million in Improper EPC Costs as calculated in Long International's alternative Bottom-Up Methodology based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.*				
4.	*43. A specific award of US$ 165,345,825 for Owner's Delay Costs Due to CB&I Failures (Claim Category 17) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *44. A specific award of US$ 109,883,718 for PCS Delay Costs Due to CB&I Failures (Claim Category 18) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *50. A specific award of US$ 809,813,402 for Loss Profits (Claim Category 24) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach, with an offset/credit of (US$22,926,290) due to the extended life of the Refinery.* *51. A specific award of US$ 325,007,417 for Cost of Capital on Loss Profits (Claim Category 25) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *52. A specific award of $12,235,789 for Lost Revenue from Electricity Sales (Claim Category*	CPHB, para. 532	*[1] a. A declaration that Reficar is not entitled to any monetary damages or declaratory relief, including, but not limited to, the monetary damages and declaratory relief requested in Reficar's Request for Arbitration and Exhaustive Statement of Claim.* *[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[18] r. A declaration that Reficar's potential damages for late completion of the Work are capped by the Delay Liquidated Damages provisions in the EPC Contract.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that Reficar is owed USD 366.25 million for liquidated damages for delay.**

	26) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach. *55. In the alternative to Requests 43, 44, 50, 51, and 52 above (Delay Claim Categories Other than EPC Costs), a specific award of US$ 366,250,000 for Liquidated Damages for Delay based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.*				
5.	*45. A specific award of US$ 1,615,527 for PCS Completion of Outstanding and Incomplete Work (Claim Category 19) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *46. A specific award of US$ 8,692,212 for PCS Correction of Defective Work (Claim Category 20) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *47. A specific award of US$ 10,318,811 for PCS Specific Impacts on Contractors Due to CB&I Failures (Claim Category 21) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.*	CPHB, para. 532	*[1] a. A declaration that Reficar is not entitled to any monetary damages or declaratory relief, including, but not limited to, the monetary damages and declaratory relief requested in Reficar's Request for Arbitration and Exhaustive Statement of Claim.* *[3] c. A declaration that Reficar's claims are dismissed in their entirety.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that Reficar is owed USD 20,626,550 for specific impacts on PCS contractors, including the completion of outstanding and incomplete work and the correction of defective work.**
6.	*13. A declaration that CB&I is not entitled to payment from Reficar for invoices that did not comply with the requirements of the EPC Agreement.* *15. A declaration that Reficar is not obligated to pay to CB&I any additional costs which it has not already paid.*	CPHB, para. 532	*[1] a. A declaration that Reficar is not entitled to any monetary damages or declaratory relief, including, but not limited to, the monetary damages and declaratory relief requested in Reficar's Request for Arbitration and Exhaustive Statement of Claim.* *[4] d. A declaration that Reficar breached its duties under the EPC Contract.* *[8] h. A declaration that Reficar is contractually liable*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that Reficar abused its rights and intentionally and/or maliciously breached its duties under the EPC Contract, and must reimburse CB&I for all reasonable and proper costs incurred until the EPC Contract is liquidated, in an amount of USD**

			to CB&I for abusing its rights and/or intentionally breaching its obligation to pay invoices to CB&I that are due and owing. *[11] k. A declaration that Reficar has been unjustly enriched.* *[19] s. A declaration that Reficar cannot and shall not offset its prior payments to CB&I against sums that are due and owing to CB&I, and CB&I is not obligated to return any sums it received from Reficar for the Work.* *[26] z. A declaration that the EPC Contract is a valid and binding agreement on the parties, is still in full force and effect, and Reficar must reimburse CB&I for all reasonable and proper costs it incurs until the EPC Contract is liquidated.* *[31] ee. A declaration that Reficar maliciously withheld payments from CB&I, refused to sign change orders, and induced CB&I to continue working on the Project, without intending to honor its payment obligations.*		**146,964,022 and COP 568,695,037.**
7.	*16. A declaration that Reficar properly drew on the Performance Letter of Credit and is not obligated to return any of those funds.* *17. A declaration that the Unsubstantiated Advance Payment Amount is in excess of US$ 95 million and that Reficar is entitled to draw on the full amount of the AP Letter of Credit.*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[4] d. A declaration that Reficar breached its duties under the EPC Contract.* *[5] e. A declaration that CB&I has no liability to Reficar under any Performance Guarantee.* *[20] t. A declaration that CB&I has no liability under the Advance Payment LC.* *[21] u. A declaration that Reficar fraudulently attempted to draw on the Advance Payment LC.* *[22] v. A declaration that Reficar has no right to make a demand or draw upon the Advance Payment LC.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that Reficar properly drew on the Performance LoC and that amounts already collected must be credited to CB&I in the settlement of accounts; a declaration that Reficar is entitled to fully draw on the Advance Payment LoC, and that amounts drawn reduce the total amount that CB&I is ordered to pay by this award.**

			[23] w. A declaration that the Adavance Payment LC does not secure payments made by Reficar to CB&I under the MOA or PIP. *[24] x. A declaration that CB&I has no liability under the Performance LC.* *[25] y. A declaration that Reficar is liable to CB&I for improperly drawing on the Performance LC.*		
			d. A declaration that Reficar shall return the sum it improperly drew on the Performance LC to CB&I UK and pay all of CB&I's legal costs and expenses associated with legal challenges to Reficar's demands on the Performance LC and Advance Payment LC.	RPHB, para. 675(3)(d)	

8.	*9. A declaration that CB&I breached the EPC Agreement during the execution phase through gross negligence, culpa grave, wilful misconduct, fraud, bad faith, and/or dolo (hereinafter, "Contractual Dolo").* *10. A declaration that, regardless of the existence of Contractual Dolo, Reficar is entitled to recover all damages arising from CB&I simple breach of the EPC Agreement during the execution phase because the Limitations of Liability are invalid/inapplicable due to CB&I's Pre-Contract Misconduct or for any other reason set forth in Reficar's briefing (hereinafter, "Inapplicability of Limitations of Liability").* *12. A declaration that CB&I not only committed wilful misconduct, dolo, gross negligence, and/or culpa grave through violations of the EPC Agreement, but that the aggregate, extended duration of the harm CB&I caused also constituted wilful misconduct, dolo, gross negligence, and/or culpa grave.*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[12] l. A declaration that the EPC Contract's Limitation of Liability provisions and other caps on liability or damages are enforceable under any applicable laws.* *[18] r. A declaration that Reficar's potential damages for late completion of the Work are capped by the Delay Liquidated Damages provisions in the EPC Contract.* *[28] bb. A declaration that CB&I adequately performed its obligations under the EPC Contract and is not liable for fraud, gross negligence, willful misconduct, dolo, culpa grave, or fraude.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that Reficar properly drew on the Performance LoC and that amounts already collected must be credited to CB&I in the settlement of accounts; a declaration that Reficar is entitled to fully draw on the Advance Payment LoC, and that amounts drawn reduce the total amount that CB&I is ordered to pay by this award.** **A declaration that CB&I breached the EPC Contract during the execution phase through culpa grave or gross negligence and CB&I cannot avail itself of the limitation-of-liability provisions in the EPC Contract.**
9.	*18. A declaration that CB&I must fully indemnify Reficar for any judgment or decision by Colombian courts or any other governmental entity against the Owner Group that was caused by CB&I's violation of any applicable laws.* *19. A declaration that CB&I is obligated to continue to indemnify and defend Reficar for and from claims pending in Colombian courts presented by workers hired by CB&I during the project.*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[16] p. A declaration that CB&I does not owe Reficar any defense or indemnity under the EPC Contract or applicable law.* *[17] q. A declaration that Reficar owes CB&I such defense and indemnity as is required by the EPC Contract or applicable law.* *[32] ff. A declaration that CB&I is entitled to reimbursement for costs and expenses incurred in responding to the Colombian government investigations of Reficar.* *[33] gg. A declaration that Reficar is obligated to pay all*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that each Party owes the other or its Group members defense and indemnity for any judgment or decision by Colombian courts or any other governmental authority.**

			costs, expenses, fines, or penalties that CB&I incurs in responding to the Colombian government investigations of Ecopetrol, Reficar, or their employees and representatives.		
			c. A declaration that neither Party has asserted a liquidated claim for indemnity, and any claims for indemnity asserted in this Arbitration are premature and not ripe for resolution;	RPHB, para. 675(3)(c)	
10.	*20. A declaration that CB&I UK and CBI Colombiana are jointly and severally liable for all obligations declared and amounts awarded herein pursuant to the parties' Section 18 and other provisions of the Parties' Coordination Agreement as well as applicable law.* *21. A declaration that CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded herein pursuant to the Parent Guarantee Agreements.*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that CB&I UK and CBI Colombiana are jointly and severally liable under any Project Agreement. A declaration that CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded pursuant to the Parent Guarantee.**
			f. A declaration that (i) CB&I UK has demanded payment of amounts owed jointly and severally to CB&I UK and CBI Colombiana in this Arbitration, and (ii) requiring Reficar to pay CB&I UK any amounts awarded in this Arbitration that are owned jointly and severally to CB&I UK and CBI Colombiana as required by article 1570 of the Colombian Civil Code.	RPHB, para. 675(3)(f)	
11.	*60. A declaration that the Tribunal has Liquidated the EPC Agreement and established the appropriate EPC Agreement value pursuant to its awards and declarations above.*	CPHB, para. 532	*[2] b. An award to CB&I of monetary damages and other relief requested in its Answer to Request for Arbitration and Counterclaim, Non-Exhaustive Statement of Counterclaim, Exhaustive Statement of Counterclaim, and Reply to the Non-Exhaustive Statement of Defense to Counterclaim.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A payment order for the amounts awarded**

12.	*15. A declaration that Reficar is not obligated to pay to CB&I any additional costs which it has not already paid.* *43. A specific award of US$ 165,345,825 for Owner's Delay Costs Due to CB&I Failures (Claim Category 17) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *46. A specific award of US$ 8,692,212 for PCS Correction of Defective Work (Claim Category 20) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *47. A specific award of US$ 10,318,811 for PCS Specific Impacts on Contractors Due to CB&I Failures (Claim Category 21) based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, and/or (iii) CB&I's Fiduciary Breach.* *56. In the alternative to Requests 25 through 42 above (Top-Down Claim Categories), an award of US$ 1,945.96 million in Improper EPC Costs as calculated in Long International's alternative Bottom-Up Methodology based on (i) CB&I's Contractual Dolo, (ii) the Inapplicability of the Limitations of Liability, (iii) CB&I's Fiduciary Breach, and/or (iv) CB&I's Reimbursement Obligation.* *60. A declaration that the Tribunal has Liquidated the EPC Agreement and established the appropriate EPC Agreement value pursuant to its awards and declarations above.*	CPHB, para. 532	*[2] b. An award to CB&I of monetary damages and other relief requested in its Answer to Request for Arbitration and Counterclaim, Non-Exhaustive Statement of Counterclaim, Exhaustive Statement of Counterclaim, and Reply to the Non-Exhaustive Statement of Defense to Counterclaim.* *[26] z. A declaration that the EPC Contract is a valid and binding agreement on the parties, is still in full force and effect, and Reficar must reimburse CB&I for all reasonable and proper costs it incurs until the EPC Contract is liquidated.*	RPHB, para. 675(1) (ESOD, para. 1612)	**A declaration that the Tribunal has Liquidated the EPC Agreement and established the appropriate EPC Agreement value.**
			g. A declaration pursuant to article 1570 of the Colombian Civil Code that amounts owed to CBI Colombiana under the Onshore Contract can be set-off between Reficar and CB&I UK based on CB&I UK's status as a joint and several creditor with CBI Colombiana.	RPHB, para. 675(3)(g)	
13.	*49. A specific award of Cost of Capital (Claim Category 23) on the Improper Costs awarded above calculated based on the date of the Tribunal's award and Reficar's 8.6% WACC, or in the alternative, by applying the contractual interest rate for late payments of LIBOR + 2%. (Based on the*	CPHB, para. 532	*[3] c. A declaration that Reficar's claims are dismissed in their entirety.* *[35] ii. A declaration that CB&I is entitled to be awarded pre- and post-judgment interest and all other interest payable under applicable law.*	RPHB, para. 675(1) (ESOD, para. 1612)	**An order for interest on the balance after liquidation and post-award interest until the date of payment of the award.**

	calculations of Breakwater Forensics, those cost of capital amounts on Reficar's execution-phase damages as of 10-May-2019 were US$ 382,803,640 and US$ 220,009,151 for the two interest rate options). *59. An award of [pre[292] and] post-award interest, at the applicable rates under applicable law, until the effective date of payment of the award.*				
14.	*58. An award of costs of the arbitration, including attorneys' fees.*	CPHB, para. 532	*[34] hh. A declaration that CB&I is entitled to be awarded its legal fees, expert fees, and costs of this Arbitration.*	RPHB, para. 675(1) (ESOD, para. 1612)	**An award on costs.**

[292] As requested in para. 37.r) of the Terms of Reference and pleaded in SOC, paras. 619, 810 and 813, and CPHB2, p. 25.

VII. MERITS

300. Claimant's first claim is for CB&I's pre-contractual liability, which it incurred through inducing Reficar to enter into a cost-reimbursable agreement with the limitations of liability and risk allocation through *dolo incidental*, or bad faith in contract negotiations (**VII.1.**).

301. Reficar and CB&I bring a number of contractual claims (**VII.2.**): first, Reficar requests relief for Improper EPC Costs (**VII.2.1.**), second, for Improper Delay (**VII.2.3.**), third, for Work Completion costs (**VII.2.4.**) and finally for Procurement costs (**VII.2.5.**). CB&I denies Reficar's claims and brings a counterclaim, mostly for unpaid invoices (**VII.2.2.**).

302. In addition, both Parties request from the Tribunal declaratory relief related to the indemnification obligations under the EPC Contract (**VII.2.6.**).

303. Finally, Reficar brings a number of claims that the Tribunal will reject as they fall outside the Tribunal's power (**VII.3.**).

VII.1. REFICAR'S PRE-CONTRACTUAL CLAIMS

304. Reficar avers that it was induced by CB&I into changing the price structure of the EPC Contract from lump sum to cost reimbursable. Reficar makes CB&I pre-contractually liable for *dolo incidental* based on two premises:

- Respondents' failure to abide by their good faith duty to inform and provide Reficar with relevant information that was crucial to its agreement to the terms of the 2010 EPC Contracts;

- Reficar entered into the 2010 EPC Contracts on less beneficial terms due to CB&I's deception.

305. Reficar claims damages as a consequence of that deceit, because the contract turned out to be more onerous than what Reficar had been led to believe it would be.

306. CB&I, on the other hand, argues that its pre-contract actions constituted neither a breach of good faith nor *dolo incidental* (nor its equivalent under New York law).

307. The Tribunal will start by providing a summary of the facts (**VII.1.1**). Then, it will briefly summarize the Parties' positions (**VII.1.2**). Finally, it shall take a decision (**VII.1.3**).

VII.1.1. FACTS

308. The Refinery was originally designed and built in the 1950's for Intercol, an Esso affiliate, by the construction conglomerate Bechtel[293]. In the 1970's the Refinery was acquired by the Colombian State through the State-owned company Ecopetrol[294].

309. At that point in time, the Refinery was configured as a cracking refinery and was transforming low-sulfur crude oil of South American origin into propane, butane, motor gasoline, jet fuel, diesel, fuel oil and asphalt, for domestic production and export to other Latin American countries and the United States[295].

310. By the early 2000's Ecopetrol felt the need to expand the Refinery, turning it into a more efficient and profitable business, whilst at the same time addressing environmental concerns to meet new clean fuel regulations for gasoline and diesel.

311. For this purpose Ecopetrol, essentially, did three things:

- First, it commissioned the engineering and construction company, Technip, to prepare a Master Development Plan (**i.**);

- Second, it looked for an international strategic partner to invest in the modernised and enhanced Refinery (**ii.**);

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[293] Ex. R-0459, p. 8.
[294] Ex. R-0459, p. 8, Houtz CWS, para. 12.
[295] Ex. R-0461, p. 6.

- Shortly thereafter, it began searching for a contractor (**iii.**).

312. (**i.**) The Master Development Plan, finalized by Technip in 2004[296], was based on a LSTK contract estimate of approx. USD 800 million[297]. Technip advised, at that point, that an LSTK contract would eliminate the risk of possible construction cost overruns[298].

313. (**ii.**) In 2005 Ecopetrol set up a tender to search for an investment partner[299]. Glencore won the bidding for a 51% ownership stake in the Refinery and, as a result, on October 3, 2006, Ecopetrol and Glencore signed the Framework Investment Agreement (*Acuerdo Marco de Inversión*) creating Reficar, the Claimant in the current arbitration[300].

314. Glencore, with a majority stake in Reficar, and the right to nominate three out of five of the company's BofD members[301], took the lead in the development of the plan for the expansion of the Refinery. The leading role of Glencore is reflected in how the Framework Investment Agreement also specifically entrusted Glencore with developing the financing strategy for the Refinery Project[302].

315. This situation would eventually change in May 2009, when Ecopetrol re-purchased Glencore's shares in Reficar[303] and assumed the management of the Project.

316. (**iii.**) In parallel to Reficar's constitution, a new tender was set up to search for the contractor.

317. By mid-2006, apart from CB&I, two other bidders submitted their proposals for the initial EPC contract – Technip (Italy) and Técnicas Reunidas (Spain)[304]. All of them made their proposals on the basis of an LSTK contract[305].

318. CB&I showed persistent interest in the bid. On April 18, 2007, Mr. Jeffrey Sipes, the director of business development for CB&I Americas, reached out to Glencore to "discuss [...] the execution of the expansion on a firm price turnkey basis"[306].

319. Emphasizing the importance of the price modality, Reficar replied on the same day asking for a confirmation of whether CB&I would be willing to undertake the work

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[296] Ex. R-0465; Ex. R-0462.
[297] Ex. R-0465, p. 6, identifies the number as approx. USD 792 million, while Ex. C-0907, p. 14 refers to USD 806 million (+/- 10%).
[298] Ex. R-0462, p. 7 "*El proceso de consecución de una firma para la ingeniería de detalle y la construcción, debe ser realizada por medio de un contrato "llave en mano" a fin de eliminar el riesgo de los posibles sobre costos en la construcción*".
[299] Ex. R-0468; Houtz CWS, para. 15.
[300] Ex. C-0024, p. 5; Ex. R-0473, p. 17; Houtz CWS, para. 16.
[301] Houtz CWS, para. 19; Ex. C-0908, Secton 7.03 of the AMI.
[302] Ex. C-0908, Section 5.04 of the AMI: "*El Accionista Adjudicatario [Glencore] podrá diseñar el mecanismo de financiación que, de acuerdo con las buenas prácticas financieras, sea más conveniente para la Sociedad y esta, en el seno de la Junta Directiva, aprobará dicha estructura de financiación.*"
[303] Houtz CWS, para. 109; Ex. C-0939; Gutierrez CWS, para. 12.
[304] Ex. C-0054, p. 8.
[305] Ex. C-0388, p. 2: "The basic design documents developed in Phase II will be the basis of CBI's lump sum price". CB&I's presentation adhered to the premises of the bidding, which applied to all participants.
[306] Ex. R-0477, p. 4.

under a lump sum fixed price basis[307]. The following day, in his reply, Mr. Sipes stated as follows[308]:

> "To confirm, we remain interested and capable of executing the refinery expansion on a lump sum basis. [...] CB&I is uniquely qualified to execute the expansion on an LSTK basis. We have relevant engineering experience on all the key process units, capability to perform the modular fabrication in house and experience with direct-hire construction in Colombia. We are one of the few (if any) companies that could adequately quantify and manage the risk and whose principal business model is lump sum turnkey contracting". [Emphasis added]

320. On October 10, 2007, CB&I issued a "Summary of [its] Proposal for Development of EPC Contract", in which it stated it had committed key project team resources to the project development effort and offered substantial cost savings for Reficar on the basis of an LSTK contract[309]. This document additionally promised that CB&I would "[m]aximize use of CBI direct hire construction force to maintain productivity"[310] and execute the "[m]ajority of Construction Activities" using "CBI employees at CBI's cost"[311].

321. In October 2007 Nexant Chem Systems Limited ["**Nexant**"] prepared an independent evaluation of the planned EPC agreement and the bids submitted by the three would-be contractors[312].

322. On the subject of the contracting strategy, Nexant unequivocally recommended a "'defined price' Lump Sum Turn Key (LSTK) contract" as the "optimum approach"[313]. This was reinforced by further findings that[314]:

- "The Project Sponsor and its shareholders have limited support resources to oversee the Project execution EPC and will require the closer approximation to a LSTK approach.

- The Project Sponsor and its shareholders do not have the resources to adopt high financial and technical risks and therefore need to negotiate an EPC Contract that can come closest to the optimum Project approach including moving the bid bases to a LSTK as soon as possible".

323. Regarding the bids, the Nexant report found that "[...] CB&I appears to propose the most feasible approach to the Project"[315]. Reficar's Mr. Houtz testified that

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[307] Ex. R-0477, p. 3.
[308] Ex. R-0477, p. 2.
[309] Ex. C-0025.
[310] Ex. C0025, p. 1.
[311] Ex. C0025, p. 3.
[312] H-1, slide 24; Ex. C-0054 at p. 8 – although the date when Nexant was retained is not explicitly stated in the exhibit, Reficar's representation of "early 2007" during the Hearing was never contested by CB&I and is logical given the date of Nexant's report – October 2007.
[313] Ex. C-0054, p. 38.
[314] Ex. C-0054, p. 39.
[315] Ex. C-0054, p. 12.

CB&I's representations regarding the LSTK bid played an important role in its selection[316]:

> "During this timeframe, few contractors were interested in providing a LSTK bid for the Project, and CB&I's representations that it would pursue the Project on a LSTK basis was a material consideration to Reficar in selecting CB&I".

1. PROJECT DEFINITION PHASE

324. The Project Definition Phase, sets out the requirements for the project to achieve its goals under a defined scope[317]; the Project Definition Phase, or pre-project planning, may be broken down into separate Front End Loading ["**FEL**"] phases:

- FEL-1 (Concept Definition / Feasibility),
- FEL-2 (Process Design) and
- FEL-3 (Basic Engineering),

with the two latter being jointly referred to as Front End Engineering Design ["**FEED**"][318]. The FEL 1 through 3 phases are separated by so-called "gates"[319] – these gates require the project to pass through decision-making "stops" which ensure that the project is ready to advance to the subsequent phase[320].

325. The FEL-1 on the Project was handled by KBC Advanced Technologies ["**KBC**"], which delivered its FEL-1 report in December 2007[321]; the document constituted one of the bases for the FEL-2 and FEL-3 phases for which CB&I later became responsible[322]. CB&I was also involved in FEL-1 activities: it was contracted for early work supporting the definition of the facilities and coordinating supply of licensor technology[323].

326. As the work on FEL-1 was nearing completion, on November 6, 2007, Reficar and CB&I entered into the "**Project Definition Contract**"[324] for phases FEL-2 and FEL-3 (or the FEED), with the goal of developing the Project scope and schedule, and an LSTK price[325].

327. The Project Definition Contract specifically allowed Reficar to appoint Technip – who had already produced the Master Development Plan back in 2004 and who

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[316] Houtz CWS, para. 88.
[317] B&O'B ER, Appendix C, para. 7.
[318] B&O'B Rebuttal ER, footnote 13 on p. 11.
[319] WMC ER, para. 226.
[320] WMC ER, para. 226.
[321] Ex. B-013.
[322] Ex. C-0910, p. 8; Ex. C-0390, p. 5.
[323] Ex. C-0391, p. 4.
[324] Ex. R-0010 (Ex. C-0006). Apart from CB&I, Technip was also involved in the 2007 Project Definition Contract, even though it acceded through a separate agreement.
[325] Ex. R-0010, p. 5.

provided the second highest evaluated bid – to carry out some of the FEED[326]; still, CB&I retained responsibility for this Project phase[327].

328. The Project would start under a cost-reimbursable basis, followed by a definitive LSTK EPC contract[328]. Accordingly, in January 2008, when CB&I filed its first monthly progress report under the Project Definition Contract, it confirmed that while the FEL-2 and FEL-3 phases were paid on a cost reimbursable basis, there would be an eventual conversion to LSTK for the EPC phase[329]. Incidentally, the report acknowledged that the management of the budget and schedule during the cost reimbursable period would be the same as if the contract were an LSTK and there would be safeguarding of Reficar's resources as if they were CB&I's own[330].

> [This appears to be the first instance of this phrasing, which will be important in the Tribunal's analysis of CB&I's eventual contractual obligations.]

329. CB&I employees ultimately spent over one million man-hours working on the Project Definition Contract[331].

2. GENESIS OF THE SHIFT TO A COST REIMBURSABLE REMUNERATION SCHEME

330. Simply put, the differences between an LSTK and a cost-reimbursable contract are the following:

- In an LSTK contract the contractor tenders a price for the completion of the scope of works – hence, the risk of cost overruns and delays lies with the contractor and not with the owner;

- In a cost plus contract, the contractor bills the owner the costs incurred in the completion of the scope of works plus a margin – thus, the price and time risks rests with the owner and not with the contractor.

Change in CB&I's attitude

331. The Refinery Project was not CB&I's first LSTK contract; in fact, as per its own representations, it had ample previous experience and it had just finalized two UK-based LSTK projects – alas with significant losses[332].

332. In an airplane conversation in spring 2008 CB&I's Mr. Sipes told Reficar's Mr. Houtz that "CB&I wanted to avoid another LSTK contract" because "CB&I

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[326] Ex. C-0006, p. 18 at Clause 10.27. and under 1.1, Definitions: "Basic Design Engineering Contractor" means Technip or such Other Contractor as may be appointed by RCSA and approved by Contractor whose approval will not be unreasonably withheld."
[327] Houtz CWS, paras. 54, 59; Figure 3 on p. 24 shows that CB&I was responsible for the Basic Design of almost half of the units, with Technip responsible for some – as subcontractor to CB&I – and MECOR and KBR responsible for one unit each. Technip acted as a sub-contractor to CB&I.
[328] Ex. R-0010, Schedule One, para. 1, p. 56.
[329] Ex. C-0390, p. 2.
[330] Ex. C-0390, p. 2.
[331] Ex. C-0009, p. 15.
[332] Ex. C-0011, pp. 3-4.

had recently lost money on a lump sum project in Ireland" and "contractors [were] leery to commit to LSTK contracting arrangements"[333].

333. In May 2008, CB&I informed Reficar that an LSTK price would have to account for escalation costs in a range between 10% and 40%, increasing the contract price from USD 3.5-4.8 billion to USD 4.3-5.5 billion[334]; reflecting the premium on LSTK contracting in times of highly volatile market conditions. CB&I requested a meeting to "discuss [...] the potential impact of escalation, continued scope growth and contracting strategy"[335].

334. Given its losses on the two UK-based LSTK projects, CB&I decided to reduce the number of LSTK contracts and move to cost-reimbursable ones. This step was explicitly announced by CB&I in an investor call on July 15, 2008[336]:

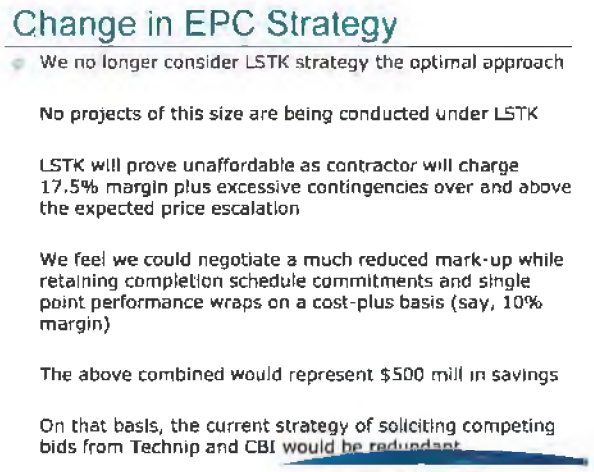
> "As we have discussed on numerous occasions, we are de-risking our portfolio by modifying our fixed price business model. During the past year, we have reduced CB&I's risk profile from 90%+ higher-risk projects to around 55%. [...] We are also targeting a portfolio mix of no more than 20 to 25% risk in work by the end of 2009".

335. While CB&I was changing its strategy to favour lower-risk RC contracts over LSTK ones, the volatile market conditions prompted Reficar to independently reassess whether to proceed with the EPC phase of the Project on an LSTK or RC basis.

A. Reficar's June Steering Committee

336. On June 10, 2008 Reficar's Steering Committee met to examine the different contracting strategies for the Project. In view of CB&I's reluctance and the price increase that an LSTK contract implied, in that meeting Reficar did not oppose the change in contract structure and made a presentation acknowledging that the LSTK strategy was no longer considered the optimal approach, because no projects of similar size were being conducted under LSTK, and RC contracts offered considerable savings[337]:

[333] Houtz CWS, para. 87, quoted in RPHB1, para. 77.
[334] Ex. R-0484, p. 2.
[335] Ex. R-0484.
[336] Ex. C-0011, p. 4.
[337] Ex. C-0928, p. 44. The Tribunal notes that the Agenda slide of the presentation, at p. 2, mentions that the relevant section of the presentation was made by "EH", which must mean Mr. Ernest Houtz, who at that point was an employee of Glencore; Mr. Houtz claims that the Steering Committee at the time was comprised mainly of Glencore representatives and that no members of Ecopetrol were on the Steering Committee as Ecopetrol had not yet re-purchased Glencore's shares in the Project, see Houtz CWS, para. 90.


Change in EPC Strategy

- We no longer consider LSTK strategy the optimal approach

No projects of this size are being conducted under LSTK

LSTK will prove unaffordable as contractor will charge 17.5% margin plus excessive contingencies over and above the expected price escalation

We feel we could negotiate a much reduced mark-up while retaining completion schedule commitments and single point performance wraps on a cost-plus basis (say, 10% margin)

The above combined would represent $500 mill in savings

On that basis, the current strategy of soliciting competing bids from Technip and CBI would be redundant

B. Reficar's June BofD meeting

337. Also in June 2008, Reficar's highest administrative body, the BofD met. The BofD had representatives of both shareholders at the time, Ecopetrol and Glencore. The discussion of an "[u]pdate of the revision of the contracting strategy of EPC" was put on the agenda[338], the chairman made a presentation and at the end no decision was taken, except to order management to study the issue in depth[339]:

> "*Después de discutir el tema, la Junta Directiva instruyó a la Sociedad estudiar con mayor profundidad el tema y presentar a los Directores los análisis y soporte[s] suficientes para efectos de poder tomar una decisión sobre la posibilidad de [...] modificar el tipo de contrato llave en mano o LSTK a un contrato "cost plus"*".

338. Towards the end of the month, representatives of Reficar and CB&I exchanged emails apparently confirming that "current contractual arrangements will be changed to cost reimbursable"[340].

C. Retention of Pathfinder

339. In order to make an informed decision on the change, and to comply with the instructions given by its BofD, Reficar retained Pathfinder LLC ["**Pathfinder**"], a respectable consultancy, to evaluate the alternative contracting strategies and review the cost estimate prepared by CB&I[341]. Pathfinder was specifically put on notice that Reficar was considering executing the Project on a cost plus basis[342].

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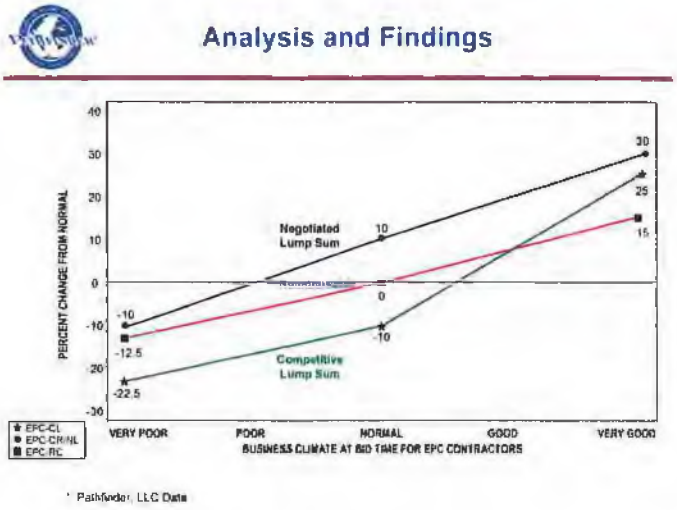
[338] Ex. R-0489, p. 2 at. 2.5, pp. 3-4 at 5.
[339] Ex. R-0489, p. 4; translation at p. 16:
"After discussing the topic, the Board of Directors instructed the Company to study it more in depth and present the Directors with suficient analysis and support to be able to make a decision on the possibility of [...] modifying the type of turnkey or LSTK contract to a "cost plus" contract type".
[340] Ex. R-2067, p. 2; Canals RWS, para. 78.
[341] Ex. R-0488, p. 9; Ex. R-0487, p. 4.
[342] Ex. C-0012, p. 2: "Whereas the original plan was to obtain LSTK bids from both contractors, we are now considering executing the project on a cost plus basis, with CBI and Technip operating as a consortium during the execution of the rest of the basic design and the EPC phase."

340. On July 9, 2008, Pathfinder made an assessment of the Project in which it found that "a satisfactory LSTK arrangement may not be achievable"[343] as

> "project costs have typically been highest for Negotiated LS[TK] contracts" and that the best recommendation was for "reimbursable contracting arrangements, particularly when reinforced with effective Incentive Programs"[344].

341. Pathfinder likewise observed that, at that time, attempts by other market participants to start out contracts on an RC basis with a switch to LSTK modality for the EPC phase "have been largely unsuccessful"[345]. The consultant concluded that the option of using an RC contract for EPC "clearly appear[ed] to be the preferred Case!"[346] and provided the following graphic, showing the vast cost savings offered by the RC modality in the contemporaneous business climate[347]:



342. At the same time, Pathfinder identified numerous risks associated with the switch to an RC contract, including the assumption of risk for cost overruns[348], but still concluded that this strategy was the optimal one[349]. In order to mitigate the risks involved, Reficar would first need to revise the contracts already in place with CB&I and Technip and a suitable +/-10% accuracy Cost Estimate, among other items, would need to be in place[350].

D. Reficar's July Steering Committee

343. The day after Pathfinder delivered its findings, on July 10, 2008 Reficar's Steering Committee met again and was given another presentation on the subject of contract modality[351]. The presentation stressed that CB&I did not support an LSTK

[343] Ex. R-0487, p. 6.
[344] Ex. R-0487, pp. 7-8.
[345] Ex. R-0487, p. 7.
[346] Ex. R-0487, pp. 9, 14.
[347] Ex. R-0487, p. 8.
[348] Ex. R-0487, p. 16.
[349] Ex. R-0487, p. 17.
[350] Ex. R-0487, p. 17.
[351] Ex. C-0930, p. 63; see also Ex. R-0455, p. 73.

contract[352] and that the market conditions had changed, leading to a possible additional cost of over USD 500 million[353]; furthermore, the cost margin in the reimbursable modality was forecasted to be 10% lower than that for an LSTK contract[354]. The Steering Committee urged the BofD to make a speedy decision[355] because "[it] need[ed] to obtain Board approval to immediately proceed with negotiations [...] of a cost plus contract"[356].

E. Reficar's July BofD meeting

344. In view of Pathfinder's findings, and the July 10, 2008Steering Committee's request, on July 15, 2008 Reficar's BofD discussed again the strategy for the EPC Contract, on the basis of two presentations by the then President of Reficar, Mr. Richard Cohen, indicating

> "*Las diversas razones que encuentra la administración para determinar que se debe cambiar la estrategia de contratación a buscar un contrato cost-plus*"[357].

345. Among others, he explained that worldwide projects were being changed from LSTK to cost plus pricing, in order to reduce costs; the anticipated surcharge for an LSTK option would amount to USD 500 million[358].

346. On the basis of Mr. Cohen's explanations, the BofD took a cautious approach[359]:

- It authorized management to meet and confer with CB&I and Technip to discuss a cost plus EPC contract option, but without assuming any commitment;

- It instructed management to review with Pathfinder and with Linklaters (the law firm engaged by Reficar to advise on the contract negotiations) the strategy and negotiation position and to report back to the BofD.

347. On July 15, 2008, *i.e.*, five days after the Steering Committee meeting and on the same day when Reficar's BofD instructed management to approach CB&I about a potential switch to RC, the investor call mentioned before (see para. 334 *supra*) took place, in which CB&I announced to investors a change in its strategy to limit exposure to LSTK contracts[360].

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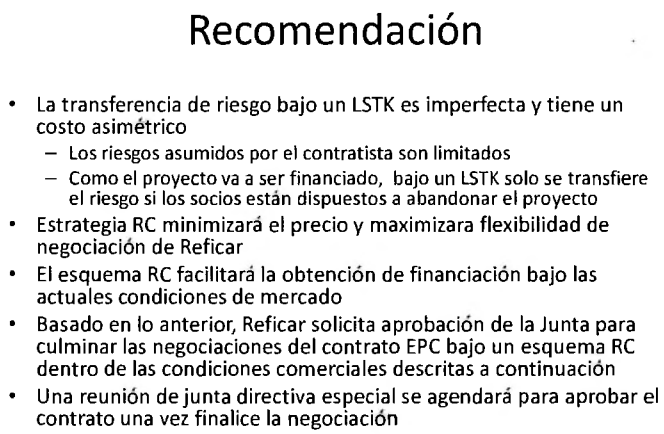
[352] Ex. C-0930, p. 75.
[353] Ex. C-0930, p. 72.
[354] Ex. C-0930, p. 75.
[355] Ex. C-0930, p. 75.
[356] Ex. C-0930, p. 80.
[357] Ex. C-0014, pp. 4-5, English translation at p. 15:
"The various reasons found by the administration for determining that the contracting strategy should change to seeking a cost-plus contract with a consortium made up of CB&I and Technip".
[358] Ex. C-0014, p. 5.
[359] Ex. C-0014, pp. 5-6.
[360] Ex. C-0011, p. 4.

348. Also in July 2008 CB&I provided Reficar's Dr. Cohen and Mr. Houtz with the iCHemE Green Book for Reimbursable Contracts [the "**Green Book**"], a reliable source of information on the general risk assumption under RC contracts[361].

F. Reficar's October BofD meeting

349. In October 2008 Reficar's BofD discussed a detailed comparison of the pros and cons of entering into an LSTK contract, on the basis of a 15-page presentation[362].

350. The recommendation by management was to proceed with a switch to a cost-reimbursable structure as it would "minimize the price and [...] maximize Reficar's negotiation flexibility [and] facilitate obtaining of financing under current market conditions", as opposed to maintaining an LSTK contract, under which "[t]he transfer of risk is imperfect and has a high asymmetric cost"[363]:



351. Notwithstanding the recommendation, the BofD again postponed a decision[364].

352. In November 2008 CB&I insisted on recommending Reficar to switch to an RC contract, emphasizing the "enormous potential" for cost savings that this change would entail for Reficar[365]:

> "There exists an enormous potential for cost savings due to the global economic crisis and its effect on currencies relative the U.S. Dollar and

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[361] Tr.: 1618:8-1619:12.
[362] Ex. R-0502.
[363] Ex. R-0502, p. 14 (30 for English translation):
"Recommendation
The transfer of risk under an LSTK mode is imperfect and has a high asymmetric cost
- The risks assumed by the contractor are limited
- Since the project is going to be financed, under LSTK mode the risk is only transferred if the partners are willing to abandon the project

The RC strategy will minimize the price and will maximize Reficar's negotiation flexibility.
The RC scheme will facilitate the obtaining of financing under current market conditions
Based on the foregoing, Reficar requests approval from the Board to conclude the negotiations of the EPC contract under an RC scheme within the commercial conditions described as follows
A special meeting of the board of directors will be scheduled in order to approve the contract once negotiations have concluded".
[364] Ex. R-0456, p. 4.
[365] Ex. C-0020.

> material pricing – a savings that Reficar cannot fully realize in a lump sum contract" [Emphasis added].

G. Reficar's November BofD meeting

353. Still unsure what to decide, Reficar's BofD met on November 24, 2008 and pondered three documents recommending a switch to RC contracting – none of which was prepared by CB&I[366]:

- A report by Nexidea (**i.**);
- A letter from Citigroup (**ii.**); and
- A letter from Technip (**iii.**).

354. (**i.**) Nexidea was a consultancy which had been engaged to independently quantify the risk associated with Reficar entering into a cost-plus EPC contract[367]. Nexidea's findings supported a switch to an RC contract:[368]

> "Savings in Cost-Plus Contract Versus LSTK Contract – Based upon the premise that (a) the historical cost model is accurate and (b) the EPC contractor will seek to increase the negotiated fixed price of a LSTK contract to limit the risk of a cost overrun to less than 5 percent of the cases, Reficar should expect to save nine (9) percent of the project cost by going with a cost-plus contract. The savings are potentially much greater considering the recent economic changes and expected downturn in costs". [Emphasis added]

355. (**ii.**) Attachment 10 to the BofD Meeting Minutes is a letter from one of Reficar's lenders[369]: on November 16, 2008, the director of Citigroup Global Markets Inc. ["**Citigroup**"], wrote to Reficar stating that Citigroup could not recommend whether an LSTK or RC basis for the contract would be a better approach for Reficar[370]. He did state, however, that in the contemporaneous difficult market conditions, lenders

> "usually prefer projects that are conservatively structured, which would mean having either a very strong LSTK EPC contract with appropriate additional contingent equity commitments or completion guarantees from creditworthy sponsors"[371].

356. He also noted that

> "very few similar downstream mega-projects have been financed on the basis of a LSTK, possibly due to the high cost of obtaining a true turnkey "wrap"

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[366] Ex. R-0476.
[367] Ex. R-1853_002, p. 3; see also Ex. R-0455, p. 79 (406 for English). Nexidea had previously been retained by Glencore to prepare the estimated cost of upgrading the Refinery back in 2006 – see Ex. R-0461.
[368] Ex. R-1853_002, p. 7.
[369] Ex. R-0505.
[370] Ex. R-0505, p. 1.
[371] Ex. R-0505, p. 1.

> and/or the difficulty of finding contractors which are truly willing and able to accept such a large potential liability"[372].

357. (**iii.**) The other contractor on the Project, Technip, was likewise against continuing with the Project on an LSTK basis[373]:

> "[a]s of today considering the present world financial turmoil, the possible market modifications during 2009 and the schedule of the Project, [Technip] consider that it would not be advisable on this date to proceed with an EPC lump sum turnkey solution".

358. Having received all this information, the BofD discussed the alternatives and again postponed any decision[374].

359. In late 2008/early 2009[375], Reficar hired Independent Project Analysis Inc. ["**IPA**"], a consulting firm specializing in the evaluation of risk for large-scale projects, to review the Project, which resulted in a March 2009 report, which confirmed that at that time, a decision on the contract modality had not yet been made[376].

3. GLENCORE'S EXIT

360. As the global financial crisis deepened towards the end of 2008, directly affecting the certainty of the financing for the Project[377], Glencore advised Reficar to continue with all the activities for the basic engineering as planned, but suspend the EPC work on the Project until the requisite funding was secured[378]. Ecopetrol disagreed, insisting that Glencore continue with the Project as it had been agreed, and not suspend the EPC phase[379]. Reficar began to study the possibility of continuing without Glencore[380]. Glencore warned that while suspending the Project would lead to delays, it "saw **no alternative** in the economic environment"[381].

361. As anticipated, in May 2009, Ecopetrol exercised its pre-emptive right and re-purchased the 51% stake held by Glencore in Reficar for USD 549 million[382]. Ecopetrol, thus, became the only shareholder of Reficar, a company now fully owned and controlled by the Republic of Colombia.

4. REFICAR'S BUDGET APPROVAL AND THE LOI

362. An important meeting by Ecopetrol's BofD took place on October 9, 2009, when the Project was officially green-lighted with a total budget set at USD 3.777 billion

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[372] Ex. R-0505, p. 1.
[373] Ex. R-0503.
[374] Ex. R-0476, pp. 10-12.
[375] Ex. C-0316, p. 1.
[376] Ex. R-2994, p. 20.
[377] Ex. C-0936, p .1.
[378] Ex. R-1837, pp. 4-5.
[379] Ex. R-1837, p. 10.
[380] Ex. R-1837, p. 8.
[381] Ex. R-1837, p. 5.
[382] Ex. R-0024, p. 3; Ex. R-0038, p. 15.

+/- 10%[383] and Ecopetrol accepted to act as guarantor for the financing to be granted to its affiliate Reficar[384].

363. Reficar's BofD followed in the footsteps: on October 20, 2009, it approved the budget for the EPC costs of USD 2.789 billion +/- 10%[385]. The total budget reached USD 3.777 billion (the same number previously agreed by Ecopetrol's BofD), resulting from EPC costs plus escalation, contingency, owner costs and sunk costs[386]:

COMPONENTE	MUSD$
Ingeniería detallada	350
Procura	1.426
Construcción	1.013
Total EPC	**2.789**
Escalación	117
Contingencia	167
Costos del dueño	367
Subtotal	**651**
Total por gastar	**3.440**
Gastado (costos hundidos)	337
COSTO TOTAL PROYECTO	**3.777**
Nivel de Precisión del Estimado	**± 10%**

The LOI

364. Ecopetrol's and Reficar's BofDs had thus approved the budget for the EPC Contract and for the Project, but the decision on the contract modality for the EPC contract was still outstanding.

365. Reficar's doubt finally ended on November 10, 2009, when it took the decision to contract on an RC basis, with CB&I acting as contractor[387]. On that date Reficar and CB&I entered into a LOI[388], which contained the key commercial terms and interim provisions while the Parties negotiated in good faith towards the final RC based EPC Contract[389].

366. Two weeks after signature of the LOI, in its meeting of November 24, 2009 Reficar's BofD was informed of and did not object to the LOI[390] – implying its agreement to a cost-reimbursable EPC Contract.

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[383] Ex. R-1848, pp. 14, 17.
[384] Ex. R-1848, p. 17.
[385] Ex. R-3708, p. 10 in conjunction with Ex. R-1853_0054, p. 3.
[386] Ex. R-1853_0054, p. 3.
[387] RFA Ex. 30, p. 4: "The following agreed Key Commercial Principles will be used as the basis for preparation of a Cost Reimbursable EPC Contract for the Cartagena Refinery Expansion Project" [Emphasis added].
[388] RFA Ex. 30.
[389] Ex. R-0047 (Ex. C-0037).
[390] See Ex. R 1853 (Contraloria File)\Contraloria\CARPETA PRINCIPAL 1\Actas Directiva R1-77\Acta No. 48 (unnumbered), p. 3: "[*Felipe Castilla*] [*i*]*nformó que el 10 de noviembre se suscribió una carta de*

367. After the signing of the LOI, no more discussions may be found in the record of a possibility of going back to the LSTK contract pricing structure.

368. A week after entering into the LOI, CB&I announced that it had been awarded a USD 1.4 billion reimbursable EPC contract for the Refinery Project[391].

Change to single contractor

369. An important part of the changes brought about by the November 2009 LOI, signed only with CB&I, was that from that moment on, the Project continued with CB&I as the only contractor on the Project. Technip, who had developed the July 2009 Estimate together with CB&I, was terminated by Reficar on December 28, 2009[392].

Foster Wheeler

370. At around the same time, on November 19, 2009 Reficar hired Foster Wheeler Consultants Inc. [previously defined as "**Foster Wheeler**"] as Project Management Consultant[393]. Foster Wheeler was an old acquaintance of Ecopetrol's: it had already verified some of CB&I's estimates[394] and was involved in Ecopetrol's other refinery[395].

5. CBI'S COST ESTIMATES

371. One of the main conditions for a successful CR contract is to have an accurate cost estimate prior to the signing. Such an estimate serves as the baseline for the decision to enter into the contract, and for the management of costs during execution.

372. In the previous section, the Tribunal has explained that in September/October 2009 the BofDs of Ecopetrol and Reficar approved their own budgets for the EPC contract of USD 2.789 billion +/-10% (the total Project was budgeted at USD 3.777 billion).

373. But Ecopetrol/Reficar was not the only party preparing budgets. CB&I did likewise. The EPC Contract which Reficar and CB&I would eventually enter into, included the concept of a **Final Full Estimate,** defined as an estimate which meets the Class II +/-10% accuracy requirements[396].

374. In anticipation of this contractual obligation, CB&I prepared a **July 2009 Estimate (C.)** and a **February 2010 Estimate Revision (D.)**, preceded by numerous preliminary cost estimates (**B.**). Before analysing these Estimates, the Tribunal must address certain issues (**A.**).

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intención por parte de la Sociedad y aceptada por CBI [...] *Sobre este tema, igualmente se manifestó que los nuevos contratos se están estructurando como "reembolsables"* [...]."

[391] Ex. C-1924, p. 5.

[392] Ex. R-0049, p. 1.

[393] Ex. R-0822; Ex. R-0534, p. 43. There was also a contract with Process Consultants Inc. Bogotá – Foster Wheeler's Colombian subsidiary and joint venture partner on the Project.

[394] Ex. R-0494, pp. 8-10; Ex. B-042, p. 29.

[395] Ex. C-0173; Ex. C-0398, p. 2.

[396] JX-002, p. 165; JX-004, p. 151.

A. Preliminary issues

375. There are three issues to be addressed[397]; the methodology used to elaborate the estimate (**a.**), the accuracy of the estimate (**b.**) and the productivity factor underlying the estimate (**c.**).

a. Methodology

376. A crucial element of any estimate by a constructor is the methodology that serves as its basis. Constructors typically prepare memoranda, for the benefit of the owner, explaining how they produce their cost estimates. CB&I did likewise: on January 30, 2009 it issued its Guidelines on Cost Estimate Classification System, with the purpose

> "[t]o provide the descriptions of the CB&I Cost Estimate System classes as provided by AACE International (American Association of Cost Engineers)"[398].

This means that CB&I had adopted the Cost Estimate Classification System provided by AACE International.

377. The AACE is a widely respected body in the domain of engineering, as acknowledged by CB&I[399]. It has developed a classification of cost estimates, whose Class number (1 through 5, or I – V in Roman numbers, which are used interchangeably) is based on the degree of project definition and the expected accuracy range. CB&I was to deliver an AACE Class II[400] estimate, meaning one based on a certain maturity of the engineering deliverables and with an accuracy level within a specified range[401].

b. Accuracy level

378. The second key element of the Final Full Estimate is its accuracy level. The Parties agreed that the Final Full Estimate to be prepared by CB&I must be within +/-10% accuracy. This understanding was not formalized in the EPC Contract, but rather in the draft **Execution Masterplan**[402] prepared by Reficar and its consultant and shared with CB&I on September 19, 2008[403]; in January 2009, CB&I issued the final version of the Execution Masterplan reiterating this assumption[404].

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[397] The Tribunal notes that another requirement for the Final Full Estimate was that it would be at P80, meaning the risk of the estimate number exceeding the predicted costs was supposed to be limited to 20%. While Reficar mentions this requirement, it does not develop its argument on this characteristic of the estimate.
[398] Ex. C-0382, p. 2.
[399] Ex. C-0382, p. 2.
[400] The Tribunal notes that some of the evidence on file refers to "Class II" estimates (in Roman numerals); these are harmonized to reflect the convention of the Arabic numerals 1-5, rather than the Roman I-V, as used by the AACE. See ex. R-1985, p. 3.
[401] This range being between +5% to +20% and between -15% to -5%.
[402] The Tribunal notes that various Project plan documents were involved in the Project; for ease of reference; the current document is Ex. C-0024; other project plan documents will be referred to using different terminology.
[403] Ex. R-0641, p. 28.
[404] Ex. C-0024, pp 13-14, p. 35, p. 106.

379. CB&I's obligation to deliver an estimate with an accuracy of +/-10% is confirmed by numerous other sources:

- During the Hearing, both CB&I's lead estimator, Kris Gachassin[405] and CB&I's expert, David Millican[406], admitted that CB&I was aware that a Class 2 cost estimate within +/-10% accuracy was required for Reficar as a basis for its financing of the Project;

- The report by IPA, a consulting firm specializing in the evaluation of risk for large-scale projects, from March 2009, listed "a cost estimate accurate to within perhaps +/-10%" as one of the key products of the FEED phase[407];

- CB&I acknowledged in a Steering Committee meeting on May 19, 2009 that it would provide a +/-10% estimate[408].

c. Productivity factor

380. Another relevant element of cost estimates is the productivity factor which underlies the calculations. The craft productivity multipliers determine how quickly work is expected to be performed. The ratio for the productivity multipliers is based on the US Gulf Coast work hours, *i.e.*, how long it would take the workers on-site in Cartagena to perform the same amount of work as workers on the US Gulf Coast[409].

381. The discussion on the appropriate craft productivity multipliers dates back to early 2007, when CB&I was trying to convince Reficar to enter into the Project Definition Contract. It was then that CB&I represented to Reficar that it had experience with direct-hire construction in Colombia[410].

382. The Parties now argue on who was responsible for estimating the productivity factors, which, in the course of the Project, turned out to have been understated.

B. Preliminary cost estimates

383. The Tribunal will now briefly address these preliminary cost estimates, which were prepared by CB&I under the two contracting modalities, at a time when Reficar was pondering which of the two to choose.

a. LSTK pricing

384. In May 2008 CB&I presented its first own cost estimate for the Project. With +23/-11.5% accuracy it estimated the cost of the Project at between USD 3.45 billion and USD 4.8 billion, with a reference point of USD 3.9 billion[411].

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[405] Tr. 2646:15-2648:8.
[406] Tr. 5305:14-5306:7; Mr. Milican testified to Mr. Deidehban's words on this and agreed that the estimate was required to meet the AACE requirements.
[407] Ex. R-2994, p. 86.
[408] Ex. C-0173, p. 2.
[409] Ex. C-0041, p. 22, Hillier ER, Section B, at B6.2.
[410] Ex. R-0477, p. 2.
[411] Ex. R-0484, pp. 3-4.

385. One month thereafter CB&I together with Technip revised the May 2008 estimate to account for further Project scope reductions and other design parameter changes, leading to a +23/-11.5% accuracy estimate between USD 3.15 billion and USD 4.3 billion, with a lower reference value of USD 3.522 billion[412]. In an email of July 20, 2008, CB&I presented a preliminary cost estimate amounting to USD 3.518 billion[413]. By November 21, 2008, CB&I's last LSTK estimate, had increased to USD 4.561 billion[414].

386. Meanwhile, Reficar had retained Pathfinder to help control the estimating process. Pathfinder had even sent a team of four persons to CB&I Houston Office to become familiar with the work process[415]; ultimately, Pathfinder would provide a detailed analysis of the numbers and methodology of CB&I's November 2008 estimate, the first one prepared on the basis of RC pricing[416].

b. <u>RC pricing</u>

387. This first RC cost estimate was provided on November 17, 2008, and was set at USD 3.654 billion (+/-15%)[417]. On December 12, 2008, CB&I issued a revised cost estimate which decreased the reference value from USD 3.654 billion to USD 3.421 billion, excluding escalation, contingency and owner's costs[418].

388. On January 7, 2009, Reficar requested meetings to reduce the Project budget because the conditions for obtaining financing were deteriorating[419]. These "**Value Engineering Meetings**" hosted by CB&I in Houston were held on January 12-20, 2009[420] and resulted in a set of changes to the Project agreed on March 10, 2009, which amounted to savings of USD 125 million[421].

389. A few days thereafter, on January 29, 2009, CB&I issued the Execution Masterplan; which addressed a key issue for the upcoming Final Full Estimate: the appropriate productivity factor for the construction should be a multiplier in the 1.6 to 1.7 range vs. US Gulf Coast standard[422]. This multiplier would be achieved by

> "increasing the rate of supervision for each crew and assuring the materials, drawings and tools needed to perform the work are available according the plan"[423].

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[412] Ex. R-0486, pp. 4-5.
[413] Ex. C-0017.
[414] Ex. C-0018, p. 2.
[415] Ex. R-0029, p. 5.
[416] Ex. R-0029.
[417] Ex. R-0028 p. 6; Respondents' Combined Chronology, p. 13; Ex. R-0029, p. 8.
[418] Ex. C-0395.
[419] Ex. R-0020.
[420] Ex. R-0513.
[421] Ex. R-0514, p. 2.
[422] Ex. C-0024, p. 18.
[423] Ex. C-0024, p. 46.

390. In March 2009, Reficar's consultant IPA delivered a report in which it analysed the CB&I November 2008 cost estimate[424]. IPA also made a presentation in which it accepted average productivity in Colombia as 1.7 the US Golf Coast rate[425].

391. On April 6, 2009, CB&I issued Revision 2 of the Project Execution Strategy, which foresaw a total cost of USD 3.4 billion[426].

C. The July 2009 Estimate

392. CB&I had, by mid-2009, presented a total of five preliminary cost estimates and was intimately familiar with the Project, as it was responsible for the vast majority of the FEED work. These estimating exercises, however, still did not meet the Class II AACE +/-10% accuracy requirements, which was required of the Final Full Estimate.

393. The first estimate, which (at least, at face value) mentioned being Class II AACE +/-10% accuracy, was provided on July 31, 2009. CB&I and Technip completed the July 2009 Estimate, which came to USD 3.495 billion[427], was labelled "Class 2 (+/-10%)"[428], and covered the EPC Contract, without owner's costs, escalation and contingency[429]. CB&I presented the Estimate to Reficar on August 3, 2009[430] together with a breakdown of the methodology behind the calculations[431] and a slip of the estimate on a unit-by-unit basis[432].

394. The July 2009 Estimate contains a blended productivity factor of 1.86 for greenfield work (the parts of the Project that were to be newly built), with brownfield work (modernization work done on already existing parts of the Refinery) being given 15% to 50% mark-ups[433].

> [The Parties now dispute whether this estimate actually met the required standards of a Class 2 with +/-10% accuracy. Reficar argues that the July 2009 Estimate was not and could not have met the requirements of an AACE Class 2 +/10% estimate, while CB&I avers that the Estimate was in fact compliant with those requirements].

Review by Foster Wheeler and Cost Reduction Workshops

395. CB&I's July 2009 Estimate was too high for Reficar, who was looking for a significantly reduced cost. Reficar instructed Foster Wheeler to review CB&I's July

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[424] Ex. R-2994, pp. 31-40.
[425] Ex. R-3662, p. 85.
[426] Ex. C-0396, p. 4; R-0618.The Tribunal notes minor discrepancies between the two documents despite them being the same revision of the document but these discrepancies do not have an impact on the analysis.
[427] Ex. R-0524, p. 231.
[428] Exs. R-0033, p. 1; C-0748; C-0400, p. 2.
[429] Ex. R-0033, p. 6.
[430] Ex. R-0524.
[431] Ex. R-0033.
[432] Ex. R-0525.
[433] Ex. R-0033, para. 8.1 at p. 19.

2009 Estimate, which Foster Wheeler did on August 14, 2009, reducing CB&I's calculation by USD 0.25 billion to USD 3.229 billion[434].

396. Furthermore, Reficar invited CB&I to participate in a series of Cost-Reduction Workshops ["**CRWs**"], with the aim of identifying potential changes to the scope, and other improvements that would reduce the cost, such as changes in the assumed productivity multipliers[435]. The Parties met on August 5, 2009, and in the meeting Reficar stated that it was looking at potential cost savings opportunities to "tighten the number" and "get the numbers down to a manageable level"[436].

397. At one of the meetings, discussions arose as to possible reductions in the productivity multipliers (*i.e.*, assuming an increased productivity of Colombian workers); CB&I, however, noted that this assumption was overly optimistic, and Foster Wheeler concurred that the productivity in Colombia was not very good[437].

398. The CRWs continued through the rest of August and then September.

Synergy Changes

399. Additionally, upon Glencore's exit from the Project in May 2009, Ecopetrol began looking into other scope changes which would allow for an optimization of synergies with:

- Ecopetrol's other refinery in Colombia[438], which was also undergoing major changes[439], and

- A company owned by Ecopetrol, which was the main producer of polypropylene in Colombia[440].

400. The potential synergies were finally narrowed down to the deferral or deletion of certain units (mostly gasoline-producing upgrades) and the expansion of others [the "**Synergy Changes**"; the Parties frequently refer to the main aspect of the Synergy Changes as "Case 1.3.7"][441].

401. The Synergy Changes evolved between July 2009 and June 2010. The evolution, with a certain degree of simplification to avoid technical details, can be categorized as follows[442]:

- The base case from July 2009: low investment deferral scope[443];

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[434] Ex. B-042, p. 29.
[435] Chinchilla CWS, paras. 16-23.
[436] Ex. C-0401, p. 1.
[437] Ex. R-0545, p. 2.
[438] Ex. C-0399, p. 2; Ex. R-0515, p. 14.
[439] Ex. C-0398, p. 3; Ex. C-0173, p. 2.
[440] Ex. R-0516, p. 189; Ex. R-0549, p. 12.
[441] Ex. C-0399, p. 46; Ex. R-0518, p. 4; Ex. C-0398, p. 3.
[442] WMC ER, paras. 447-459.
[443] Ex. B-041 does not mention the turboexpander, which implies that at that point it was supposed to be deleted.

- The October 2009 case: base case plus Maximum Propylene[444];
- The January 2010 case: base case plus Maximum Propylene plus Full Burn FCC[445]; and
- The June 2010 case: base case plus Maximum Propylene plus Full Burn FCC plus FCC Power Recovery[446].

July 2009 Estimate, Revision 1

402. On September 3, 2009, as a result of the CRWs, CB&I presented Revision 1 to the July 2009 Estimate, which identified USD 235 million in potential savings related to the CRWs[447]. The estimated EPC costs were now USD 2.899 billion[448]. But, upon further studies, on September 24, 2009 the estimate was lifted to a total EPC cost value of USD 2.989 billion[449].

Budget approval by Reficar

403. *Pro memoria*: in October 2009, the BofDs of Ecopetrol and Reficar approved the budget for the EPC Contract in an amount of USD 3.777 billion, with USD 2.789 billion[450] for EPC costs only (excluding Owner's costs, escalation, contingency and sunk costs). This fell USD 200 million short of the July 2009 Estimate, Revision 1 prepared by the contractor at the end of September 2009, with EPC costs at USD 2.989 billion[451].

404. There is no information in the file explaining how Reficar intended to achieve this necessary USD 200 million cost reduction.

D. The February 2010 Estimate

405. In the meantime, the final design of the Project was being developed. On December 15, 2009, CB&I finally reported that FEED was now 100% complete[452], permitting the preparation of the final estimate.

> [However, further design changes were later introduced by Reficar to certain units on the Project as part of the ongoing Synergy Changes; meaning that the accuracy of estimations for those units would not be at possible at the agreed level.]

406. On February 28, 2010, CB&I produced its Revision 2 – Final Estimate Scope to the July 2009 Estimate[453] [the "**February 2010 Estimate**"][454]. This estimate was made,

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[444] WMC ER, paras. 453-456.
[445] WMC ER, para. 457.
[446] WMC ER, paras. 458-463.
[447] Ex. C-0032, p. 64.
[448] Ex. C-0032, p. 52.
[449] Ex. R-3444, p. 3, Houtz CWS, para. 122.
[450] Ex. R-1848, pp. 14, 17; Ex. R-3708, p. 10 in conjunction with Ex. R-1853_0054, p. 3.
[451] Ex. R-3444, p. 3.
[452] Ex. C-0009, p. 15 (Ex. R-0555).
[453] Ex. C-0041 (Ex. R-0546), p. 2.
[454] As a threshold matter, on the basis that the document is named "31 July 2009 Class [2] (+/-10%) Revision 2 – Final Estimate Scope February 28, 2010", the Tribunal shall refer to the document as the **February**

for the first time, without the participation of Technip. It forecast that the EPC Contract would cost USD 3.150 billion[455], including escalation and contingency[456] – this is a major difference from the previous estimates, which did not account for escalation or contingency costs.

407. The February 2010 Estimate constitutes a revision of the July 2009 Estimate, and incorporates the following changes[457]:

- late adds, deletes and changes, which were explicitly labelled as **ROM** or **Rough Order of Magnitude**

  [According to the AACE Guidelines from 2005, Order of Magnitude estimates typically mean an accuracy range of -30/+50%[458] although different ranges are acceptable; CB&I used a +/-50% range as ROM on the Project[459].];

- reductions identified in the CRWs;

- modifications caused by the Synergy Changes[460];

408. The Estimate states explicitly that it is based on the scope of work of the July 2009 Estimate and that it remained the same except for the changes listed above[461].

409. The February 2010 Estimate Revision uses a 1.66 productivity multiplier for a majority of the works to be performed in the greenfield area of the Project[462]. The brownfield work was given a 15% to 50% mark-up to account for the interruptions[463].

[Reficar argues that the February 2010 Estimate, increased by USD 115 million addition due to the Synergy Changes, was later incorporated into the EPC Agreement as the "Final Full Estimate", as Appendix IV to Section III[464]; however, CB&I disputes this and the Contract received by the Tribunal is empty in the section where the Final Full Estimate should be situated[465].]

2010 Estimate taking into account that multiple documents in the record have revisions, and they are always referred to by the Parties under their original iteration's name.

[455] Ex. C-0041, p. 50.

[456] Ex. C-0041, p. 9.

[457] Ex. C-0041, pp. 7-8.

[458] Ex. R-1985, pp. 4 [ANSI Standard Reference].

[459] Tr. 2656:6-19.

[460] The scope was defined as "No NHT/CCR, Full FCC Scope less Turbo Expander, Install Butamer and Alkylation Units, No Benzout Unit, Associated reductions in utility and supports systems - No redesign"; see Ex. C-0041, p. 8. This implies that the Synergy Changes were incorporated as of their initial, July 2009 case.

[461] Ex. C-0041, p. 8.

[462] Ex. C-0041, p. 22.

[463] Ex. C-0041, pp. 22-23.

[464] JX-002, p. 165; JX-004, p. 151. This was also the nomenclature used when referring to the February 2010 Estimate during the Hearing.

[465] See JX-006; Appendix 3 ends at p. 609 and immediately after, at p. 610, Appendix 5 begins.

A cost reduction and a cost increase

410. On April 8, 2010, Reficar wrote to CB&I stating that the February 2010 Estimate resulted in total costs that exceeded the approved October 2009 budget by some USD 77 million:

- in accordance with the budget, the EPC Contract was expected to cost USD 2.789 billion, plus escalation of USD 117 million and contingency of USD 167 million (total USD 3.073 billion);

- while the February 2010 Estimate was USD 3.150 billion

and asked for an appropriate reduction[466]. CB&I responded on April 26, 2010, offering an explanation of the differences in numbers[467].

411. Eventually Reficar's budget for the EPC Agreements was increased to USD 3.106 billion[468], with the difference coming down from USD 76 million to USD 46 million.

412. But this was not the end of the story: over the months of March and April 2010, CB&I issued a number of Budget Revision Notices ["**BRN**s"] caused by Synergy Changes and certain other design changes, which modified the final design, and in turn increased the final estimate by USD 115 million to USD 3.221 billion[469].

CB&I's confirmation

413. On April 30, 2010, Reficar again reached out to CB&I, with a number of questions about the February 2010 Estimate, including its accuracy and the productivity factor used[470]. In an email from May 5, 2010, CB&I:

- Confirmed that the accuracy level of the February 2010 Estimate was +/- 10%[471],

- Confirmed that it had included in the February 2010 Estimate the scope of work of the Synergy Changes "limited to the July 31st 2009 basis with the deletion of the turbo expander"[472],

- Affirmed that the productivity factor used in the July 2009 Estimate was accurate, but the reduction in the multiplier resulted from cost-savings exercises performed by Reficar, and this reduction led to craft productivity being identified as one of the

[466] Ex. C-0042, p. 2.
[467] Ex. C-0031, p. 4.
[468] Ex. R-0605 p. 12.
[469] Ex. C-0043.
[470] Ex. C-0314, p. 3.
[471] Ex. R-0027, p. 4 (Ex. C-315).
[472] Ex. R-0027, p. 2.

> "largest risk areas associated with the cost reduction efforts and was based on feedback from Reficar / ECOPETROL's work history is the most optimistic outcome in regards to productivity"[473] [Emphasis added].
>
> [Reficar argues that the February 2010 Estimate did not meet the AACE Class 2 +/-10% requirements and CB&I agrees, but avers that the Estimate was never represented as compliant with such requirements.]

6. CBI'S WORK SCHEDULE

414. Cost estimates and work schedule were the two main issues discussed before the signature of the EPC Contract. So far, this Award has focused on cost estimates but will now turn to the work schedule.

415. The detail and accuracy of a work schedule is measured against standards and definitions provided, again, by the AACE, which are categorised by levels.

Level 3

416. A Level 3 Schedule represents individual work tasks, which summarize project activities and deliverables with enough detail to manage work at the foreman level[474]. A Level 3 Schedule was intended to be resource-loaded, *i.e.*, linked to the data underlying the Final Full Estimate for the Project[475].

417. Reficar made it clear to CB&I from as early as the Project Definition Contract of 2007 that a Level 3 Resource Loaded Schedule would be key to Reficar's decision on proceeding with the final EPC agreement: the Project Execution Plan mentioned a "Level 3 Resource Loaded Schedule"[476] and a Level 3 Schedule was also part of the Tender Deliverables[477].

418. CB&I accepted this requirement and on April 22, 2008, when it issued an Execution Plan for Basic Engineering and Definition Phase, it stated that it would provide a Level 3 Schedule during the Basic Engineering Phase as part of the EPC Execution Plan[478].

419. The importance of the Level 3 Resource Loaded Schedule was reiterated in the final version of the Execution Masterplan issued by CB&I, which mentioned that[479]:

> "The CBI/ Technip and KBR schedulers will prepare a Level 3 CPM schedule for Reimbursable Phase Engineering of the Project, with the full participation and buy-in of all internal projects. CBI will be responsible to

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[473] Ex. R-0027, p. 5 (Ex. C-0315).
[474] Ex. C-0384 at p. 62 (source p. 61).
[475] See e.g. Dr. Warhoe's explanation at Tr. 4759:11-17: "And then, taking the resources, the manpower and the quantities, and inserting those in the schedule to resource load, what's referred to as resource loading the schedule, which would show all parties what the planning was in terms of manpower from week to week, month to month, and also quantities; see also Mr. Deidehban's agreement with such definition at Tr. 923:1-7.
[476] Ex. R-0010, Schedule 3, para. 4.0 C.1, p. 89.
[477] Ex. R-0010, Schedule 3, para. 5.0 B.1, p. 89.
[478] Ex. C-0391, p. 14.
[479] Ex. C-0024, p. 115.

> prepare a fully integrated Level 3 EPC schedule as part of its Reimbursable Phase Engineering deliverables. This schedule will define and work load detail engineering's design activities".

The April 2010 Schedule

420. On March 3, 2010, Reficar notified CB&I that it was in breach of its obligation to provide a Level 3 Schedule[480].

421. Soon thereafter, on March 25, 2010, CB&I delivered a preliminary Level 3 Schedule[481], which Reficar rebutted as incomplete[482]. But CB&I assuaged Reficar saying that its comments to the Level 3 Schedule had "either been incorporated or [did] not have an impact on the mechanical completion date"[483]. Reficar did not ask for further clarifications.

422. This modified schedule, called the April 2010 Schedule, set February 28, 2013 as the guaranteed mechanical completion date and was the last work schedule exchanged before the signature of the EPC Contract. The Parties agreed that the final Schedule would not be attached to the EPC Contract[484]; instead CB&I assumed the obligation to deliver a finalized Level 3 Schedule to Reficar within 90 days after the execution[485].

423. CB&I complied with its undertaking and the definitive baseline is referred to as the October 2010 Re-Baseline Schedule[486] and was delivered after the EPC Contract had been signed. Importantly, the October 2010 Re-Baseline Schedule also set the guaranteed completion date for February 28, 2013[487].

> [Reficar argues that the April 2010 Schedule was not a Class 3 Resource Loaded Schedule and CB&I avers that it was fully compliant with such requirements and that, in any event, this schedule was not relevant for the Reficar's decision to enter into the EPC Agreement.]

7. EXECUTION OF THE EPC CONTRACT

424. After intense negotiations[488] following the signing of the LOI, on May 10, 2010 the Parties agreed on the principal terms of the EPC contract in a Baseline Agreement and Negotiated Terms and Conditions[489].

425. On May 25, 2010, Reficar's BofD met to discuss whether to authorize the EPC Contract. Management presented an internal document, which acknowledged that the final estimate for the EPC Contract was the addition of two elements:

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[480] Ex. C-0409.
[481] Ex. C-1741.
[482] Ex. C-0050.
[483] Ex. C-0051, p. 1.
[484] Ex. C-0057, p. 12.
[485] JX-002, pp. 469-471; JX-004, pp. 444-446 (Project Controls Exécution Plan, Section 6.5.3).
[486] Ex. C-0058, pp. 15-21, 73.
[487] Ex. C-0058, p. 73.
[488] See Exs. R-0569, R-0573, R-0574, R-0575.
[489] JX-001.

- USD 3.106 billion, an amount different from the February 2010 Estimate by some USD 44 million, plus

- USD 115 million, resulting from the BRN's issued by CB&I after the February 2010 Estimate, to include new Synergy Changes requested by Reficar, giving a total of USD 3.221 billion.[490]

426. The BofD granted its formal approval for Reficar to enter into the EPC Agreement[491]:

> "[*La*] *Junta Directiva* [...] *autorizó de manera unánime al representante legal de la sociedad a suscribir los contratos de ingeniería, procura y construcción para el proyecto de ampliación y modernización de la refinería de Cartagena, con las compañías CB&I UK Limited y CBI Colombiana S.A. según corresponda, al igual que todos los documentos relacionados o que se deriven de dichos contratos, teniendo en cuenta como cifra máxima de negociación para el referido presupuesto estimado del proyecto la suma de US$3.221 millones*". [Emphasis added]

427. On June 1, 2010, CB&I issued Revision 3 to the Project Execution Plan, which contained a statement that, in due course of the Tribunal's analysis, will become very relevant for these proceedings:

> "even though a reimbursable contract, CB&I project management will rigorously control cost and schedule similar to a lump sum contract, safeguarding Reficar resources as if their own"[492]. [Emphasis added]

428. This was the latest Project Execution Plan version at the moment of the signing of the EPC Agreement. This Plan was eventually incorporated into the EPC Contracts, as an Annex both to the Onshore and to the Offshore Agreements and thus CB&I's commitment to rigorously control costs and to safeguard Reficar's resources became a contractual undertaking.

Execution

429. Two weeks later, on June 15, 2010, Reficar and the CB&I entities entered into six agreements collectively known as the final EPC Contracts. These agreements are as follows:

- The Onshore Contract between Reficar and CB&I Colombiana for work (mainly construction) performed by CBI Colombiana[493],

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[490] Ex. R-0605, p. 12.
[491] Ex. C-0044, p. 4 translation into English at p. 12:
"[t]he Board the Board of Directors [...] authorized the Company's legal representative to sign the engineering, procurement and construction contracts for the Cartagena Refinery expansion and modernization project with the companies CB&I UK Limited and CBI Colombiana S.A. as appropriate, together with all documents related to or arising from said contracts, taking as a maximum negotiating figure for the said estimated budget of the project the sum of USD 3,221 m".
[492] Ex. C-0055, p. 4.
[493] JX-002; JX-003; JX-006.

- The Offshore Contract between Reficar and CB&I UK for design, engineering, procurement and other work performed by CB&I UK primarily outside of Colombia[494],
- The Coordination Agreement executed by Reficar, CB&I UK and CB&I Colombiana[495],
- The Dispute Resolution Agreement between Reficar and CB&I UK, CBI Colombiana, CB&I, N.V.[496],
- The Onshore Parent Guarantee[497],
- The Offshore Parent Guarantee[498].

430. The EPC Contract is a very long, detailed and complex agreement. But for present purposes, the relevant provision are the scope of work (**A.**), compensation owed to the Contractor (**B.**), Final Full Estimate (**C.**), Cost Control Commitments (**D.**), Work Schedule (**E.**) and the limitation of Contractor's liability (**F.**).

A. Scope of work

431. The purpose of the EPC Contract was for CB&I to modernize and expand the Cartagena Refinery[499], using as a basis the initial engineering prepared under the Project Definition Contract, and proceeding onto the detailed engineering, procurement and construction stage of the Project.

432. Thus, the scope of the work under the EPC Contract is for CB&I to

> "engineer, procure, construct, up to Mechanical Completion of the Plant in Cartagena, Colombia. Additionally, to support pre-commissioning, commissioning, start-up and performance test, activities to lead by [Reficar]"[500].

B. Compensation

433. The EPC Agreement, as it is cost-reimbursable, does not set a Contract Price[501]; instead, TC 58.1.1 states that such price shall be constituted by the total amount payable[502]:

> "58.1.1 [...] As a result of the cost-reimbursable nature of this Agreement, this Agreement is of an indeterminate value [...] The actual value of this Agreement, as at the date of Liquidation, shall be determined by adding together the value of all amounts which the Contractor has been paid, or is

[494] JX-004; JX-005; JX-006.
[495] JX-007, pdf pp. 29-44.
[496] JX-007, pdf pp. 3-27.
[497] JX-008, pdf pp. 1-16.
[498] JX-008, pdf pp. 17-32.
[499] See Ex. R-0010, pp. 2, 5.
[500] JX-006, p. 9.
[501] Section I Agreement, TC 3 "Compensation"; JX-002, p. 15; JX-004, p. 15.
[502] JX-002, p. 235; JX-004, pp. 211-212.

> entitled to be paid, in each case in accordance with Section IV Appendix II." [Emphasis added]

434. The compensation to be achieved by CB&I was not based on any percentage, as is frequent in other EPC contracts. Instead, payments to CB&I were set using three major mechanisms:

- reimbursement of reasonable and proper costs undertaken in accordance with the Contract on the basis of monthly invoices (**a.**);
- a Contractor's Fixed Fee of a total of USD 175.75 million (**b.**);
- and potential bonuses (**c.**);
- CB&I also had other means of achieving profits (**d.**).

a. Reimbursement for specific costs

435. CB&I would be reimbursed for the costs undertaken on a cost reimbursable basis in the execution of the EPC Agreement. These payments would not constitute a source of profit for CB&I under TC 58.1.1, but rather, they were to cover CB&I's expenses on the Project, given its cost-reimbursable nature[503]:

> "58.1.1 In consideration of the performance by the Contractor of the Work under this Agreement, subject to the provisions of this TC58, the Contractor shall be entitled (i) to invoice and receive the Contractor's Fixed Fee, and (ii) to invoice and receive the amounts incurred with respect to its reimbursable costs, in each case in accordance with Section IV Appendix II". [Emphasis added]

436. The costs to be reimbursed were strictly limited pursuant to the provisions under Section I of the Onshore and Offshore Agreements

> "Only costs which are incurred by the Contractor in accordance with this Agreement in carrying out the Work shall be paid by the Owner"[504]. [Emphasis added]

and Appendix I on Contrator's Fixed Fee, Rates and Management Fee under Section IV on Pricing of the Onshore[505] and Offshore[506] Agreements:

> "In consideration of the performance by the Contractor of the Work under this Agreement, the Owner will pay the Contractor on a cost reimbursable basis [...] and the amount payable shall be the Contract Price. Only costs which are reasonably and properly incurred by the Contractor in accordance with the Agreement in carrying out the Work shall be paid by the Owner". [Emphasis added]

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[503] JX-002, p. 235; JX-004, pp. 211-212.
[504] Section I Agreement, TC 3 "Compensation"; JX-002, p. 15; JX-004, p. 15.
[505] JX-003, p. 3.
[506] JX-005, p. 3.

b. CB&I's fixed fee

437. CB&I was to earn a fee at an amount not subject to fluctuations[507] pursuant to TC 58.1.1[508]:

> "58.1.1 In consideration of the performance by the Contractor of the Work under this Agreement, subject to the provisions of this TC58, the Contractor shall be entitled (i) to invoice and receive the Contractor's Fixed Fee [...]". [Emphasis added]

and Section IV of the Onshore Agreement[509]:

> "2.1 The Contractor's Fixed Fee is the sum of one hundred and four million Dollars (US$104,000,000) and ten million, two hundred and thirty seven thousand five hundred Dollars (US$10,237,500), the two amounts when combined represent the Contractor's profit and compensation for the performance of the Work".

and the corresponding provisions of Section IV of the Offshore Agreement[510]:

> "2.1 The Contractor's Fixed Fee is the sum of fifty six million Dollars (US$56,000,000) and five million, five hundred and twelve thousand five hundred Dollars (US$5,512,500), the two amounts when combined represent the Contractor's profit and compensation for the performance of the Work."

438. Thus, CB&I's fixed fee under both Contracts was set at a total of USD 175.75 million, which was to be paid in instalments as the Project progressed. This money would constitute CB&I's revenue, in contrast to the reimbursable costs, which did not allow CB&I to make profits.

c. Potential bonuses

439. CB&I was entitled to additional payments on a bonus basis if it managed to achieve certain parameters during the performance of the Contract. The payment of all bonuses would only be made after CB&I complied with and discharged all of its obligations[511] under the Contract[512].

Cost bonuses

440. The cost bonuses allowed CB&I to earn up to three additional fees, provided that

- the actual Project costs were lower than

[507] Apart from slight annual adjustments for inflation as per TC 58.1.2.
[508] TC 58, JX-002, p. 235; JX-004, pp. 211-212.
[509] JX-003, p. 3.
[510] JX-005, p. 3.
[511] Other than defect warranty obligations.
[512] TC 58.13.11, JX-002, p. 239; JX-004, p. 215.

- USD 3.221 billion – a quantity defined in the Contract as "Bonus Target Costs", which corresponds to the budget approved by Reficar's BofD when it approved the Project[513].

441. The cost bonuses can be broken down to three categories:

- A fixed fee of USD 15.75 million if CB&I achieved Mechanical Completion below the Bonus Target Cost[514];

- 30% of the difference between the Bonus Target Cost and the actual costs incurred on the Project (*i.e.*, 30% of the Project cost "savings")[515];

- A Management Fee, to which CB&I was entitled under certain circumstances if it did not qualify for either of the two previous bonus categories[516].

HSE Bonus

442. CB&I was also entitled to a Health and Security bonus if it reached targets for Project security, *i.e.*, a low number of accidents and no fatalities[517].

443. The Cost Bonus and HSE Bonus were together capped at a joint value of USD 29.25 million and could not exceed that limit[518].

Early Completion Date bonus

444. The next category of bonuses was linked to an early completion of the works. CB&I was entitled to the Share-in Time Bonus if it achieved Mechanical Completion of all the Units by the Early Completion Date and the Start-Up of the Refinery was achieved within four months of the Early Completion Date[519].

Project Contingency bonus

445. The final category of bonuses that CB&I could obtain was linked to the Project contingency. CB&I was entitled to 6% of any potential savings in the Project Contingency Budget[520].

d. Additional sources of revenue

446. CB&I was entitled to additional sources of profit, which were not specifically identified in the EPC Agreement.

447. The change orders for extra work on the Project entitled CB&I to a percentage of the value as profit for CB&I – an ordinary arrangement that allows a margin for the contractor for any additional work. According to the information discussed at the

[513] TC 1.1; JX-002, p. 160, JX-004, p. 146.
[514] JX-003, JX-005 p. 4, para. 3.2.1.
[515] TC 58.13.1; JX-002, p. 237; JX-002, p. 213.
[516] TC 58.13.4; JX-002, pp. 237-238; JX-004, p. 214.
[517] TC 58.13.6, TC 58.13.8, TC 58.13.9; JX-002, p. 238; JX-004, p. 215.
[518] JX-003, p. 4; JX-005, p. 4: para. 3, "Contractor Bonus".
[519] TC 58.13.5; JX-002, p. 238; JX-004, pp. 214-215.
[520] TC 58.13.10; JX-002, pp. 238-239; JX-004, p. 215.

Hearing, the Parties agreed under TC 63[521] that CB&I would be entitled to a 6.8% markup on all change orders for extra work[522].

448. CB&I avers that it gained some extra USD 10.5 million through Reficar-accepted change orders[523].

449. Finally, CB&I has acknowledged that, at least potentially, it was possible for it to gain additional profits through rate arbitrage, *i.e.*, by remunerating its Project employees less than the hourly rate charged to Reficar for the services provided by such employees[524].

C. Final Full Estimate

450. The EPC Agreement contains a definition of Final Full Estimate as

> "the estimate which is set out in Appendix IV to Section III, which amends the detailed Class 2 cost estimate (on a +/- 10% basis) which was delivered by the Contractor and Technip to the Owner on 31 July 2009 [*i.e.*, the July 2009 Estimate]"[525].

a. Definition

451. Both the Onshore and the Offshore Agreements declare that the Final Full Estimate is attached as Appendix IV under Section III[526]. Appendix IV in the case record is, in fact, blank[527]. No document is contained therein.

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[521] JX-002, p. 243; JX-004, p. 220:
TC63 -- Extra Work
63.1 "Extra Work" is defined as work not identified in Section III Appendix 1 of this Agreement. The Owner may, at any time, without notice to the Contractor's sureties, if any, request in writing the Contractor to perform Extra Work. Following receipt from the Owner of the scope, drawings or specifications of the Extra Work, the Contractor shall submit, in writing, a proposal for accomplishing the Extra Work, including costs and start and completion dates.
63.2 The Contractor shall substantiate any costs and fees to the Owner. Following agreement between the Parties on the terms under which the Extra Work will be performed, the Extra Work will be added to the Work by a Change Order.
63.3 In the event of an emergency which the Owner determines endangers life or property, the Owner may verbally order the Contractor to perform any Extra Work required by reason of such emergency. The Contractor shall commence and complete the Extra Work as directed by the Owner. Such orders will be confirmed promptly in writing by the Owner and may be accompanied by drawings, specifications or data as necessary to show the extent of such Extra Work. Compensation in the event of emergency work shall be agreed to in accordance with the provisions for Extra Work.
63.4 Any Extra Work by the Contractor not incurred in accordance with this TC63, will not be paid by the Owner.
63.5 Notwithstanding any other provision of this Agreement, no claim by the Contractor for an adjustment hereunder will be allowed if asserted after Final Completion.
[522] Tr. 1491:1-11.; 1499:16-25; Tr. 3765:1-2. No contractual provision setting the mark up at 6.8% is to be found.
[523] ESOD, fn. 14, p. 16; CB&I simultaneously argues that Reficar rejected most of such extra work WNOCs, see RPHB, para. 479.
[524] Tr. 1501:10-16; also see Breaux CWS, para. 55.
[525] JX-002, p. 165; JX-004, p. 151.
[526] JX-002, p. 14; JX-004, p. 14.
[527] See JX-006; Appendix 3 ends at p. 609 and immediately after, at p. 610, Appendix 5 begins.

452. Reficar avers that the Final Full Estimate coincides with the February 2010 Estimate[528].

453. But this is a simplification: the Project kept evolving between February 2010 (issuance of the February 2010 Estimate) and June 2010 (signing of the EPC Contract). The February 2010 Estimate was closed on 28 February, but the design was not frozen on that date. The changes were reflected in several separate BRNs], which increased the final estimate by USD 115 million[529]. These BRNs, although not referred to in name anywhere in the Contracts, must be deemed part of the Contract-relevant Final Full Estimate.

454. This is corroborated by Mr. Deidehban's testimony, who said that the number of USD 115 million for the BRNs was a provisional amount that "went into the contract"[530].

455. CB&I's most recent stance appears to accept that either the February 2010 Estimate or that estimate together with the BRNs may indeed be referred to as the "Final Full Estimate"[531].

456. Reficar also appears to have contemporaneously considered the USD 115 million BRNs as part of the Final Full Estimate[532]. Additionally, Reficar's damages expert seems to include the BRNs as part of the Final Full Estimate[533].

457. To sum up, the EPC Contract term of "Final Full Estimate", which constituted Appendix IV to Section III of the Contract is, in fact, the February 2010 Estimate as modified by the spring 2009 BRNs submitted by CB&I. This means that the Final Full Estimate was set at a value of USD 3.150 billion[534] + USD 115 million[535], *i.e.*, a total of USD 3.265 billion.

b. Contractual relevance

458. What is the contractual relevance of the Final Full Estimate defined in the EPC Agreements?

459. The relevance is very minor.

460. The Offshore Agreement does not make any further use of the definition.

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[528] See Joint Exhibit Index, fn. 1 at pdf p. 3; CPHB, para. 92.
[529] Ex. C-0043.
[530] Tr. 964:5-17.
[531] RPHB2, para. 25: "The evidence shows that Reficar neither relied on the Estimate Revision or its accuracy level, nor believed the Final Full Estimate value was a guarantee or representation of the cost of the Work".
[532] Ex. C-0050, p. 3: "[t]he following information must be ready: [...] (iii) Final Full Estimate [...] and incorporation of any change order (Budget Revision Notices) with April 30, 2010 as cut-off date."
[533] LI ER, para. 1136.
[534] Ex. C-0041, p. 50.
[535] Ex. C-0043.

461. The Onshore Agreement only refers to the Final Full Estimate in TC 44.1.1, which provides that if the labour rates or the productivity factors used in the Final Full Estimate are changed, the Contractor is entitled to additional compensation[536].

462. Surprisingly, the Contractor does not make any representation with regard to the Final Full Estimate, nor does it assume any obligation or undertaking in relation thereto.

463. If there is one provision, which intuitively, should refer to the Final Full Estimate, it should be CB&I's cost bonus target; but, tellingly it does not do so and, instead, provides a fixed value of USD 3.221 billion, which equates with the budget approved by Reficar's BofD (a figure which is close to, but different from that of the Final Full Estimate, which adjusted by the March and April 2010 BRNs, totalled USD 3.265 billion[537])[538].

D. Cost Control Commitments

464. The EPC Agreement contains two provisions which are meant to keep the costs under control [previously defined as the "**Cost Control Commitments**"]:

465. First, Section IV of the Onshore[539] and Offshore[540] Agreements includes an Appendix I in which CB&I agreed as follows:

> "In consideration of the performance by the Contractor of the Work under this Agreement, the Owner will pay the Contractor on a cost reimbursable basis [...] and the amount payable shall be the Contract Price. Only costs which are reasonably and properly incurred by the Contractor in accordance with the Agreement in carrying out the Work shall be paid by the Owner". [Emphasis added]

466. CB&I, consequently, undertook to only charge costs to Reficar if they met a triple requirement: The costs must be

- reasonable,
- properly incurred, and
- in accordance with the Contract.

467. Second, under para. 3 of the Project Execution Plan, which, as Exhibit 13 forms an integral part of the Onshore[541] and Offshore[542] Agreements, CB&I undertook to rigorously control cost and schedule similar to a lump sum contract, and to safeguard Reficar's resources as if their own:

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[536] JX-002, pp. 215-216.
[537] USD 3150 million + USD 115 million = USD 3265 million.
[538] JX-002, TC 1.1, Definitions, p. 160 ; JX-004, TC 1.1, Definitions, p. 146.
[539] JX-003, p. 3.
[540] JX-005, p. 3.
[541] JX-002, p. 654.
[542] JX-004, p. 628.

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own". [Emphasis added]

468. The Cost Control Commitments will play a fundamental role in the Tribunal's decision regarding both CB&I's pre-contractual and contractual liability.

E. Work Schedule

469. The EPC Agreement defines "Schedule" as a level 3 schedule produced by the Contractor and approved by the Owner:

> "'Schedule' means a level 3 schedule for performance of the Work produced by the Contractor and approved by the Owner, as the same may be amended from time to time in accordance with the terms of this Agreement"[543].

470. No Schedule was attached to the Agreement. The understanding of the Parties was that the Level 3 Work Schedule would be delivered by CB&I within 90 days from signing of the EPC Contracts. This was reflected in the Project Controls Execution Plan, which was attached as Annex 6 to the Onshore and Offshore Agreement:

> "[t]he detail working Schedule will be developed within the Project WBS and will be presented in bar chart format within 90 days of contract award"[544].

471. CB&I complied with this obligation[545] and eventually delivered the October 2010 Re-Baseline Schedule[546], which reconfirmed that the Guaranteed Completion Date to achieve Mechanical Completion was February 28, 2013[547].

472. Under TC 51, CB&I undertook to perform the works in accordance with the Schedule. In situations of delay, Reficar was entitled to give a written notice to CB&I, to which CB&I would have had to respond with reasonable efforts to mitigate the delay. CB&I also undertook to provide Reficar with regular progress updates and forecasts as the Project progressed. CB&I finally agreed to cooperate with any third party contractors in a joint effort to comply with the schedule.

473. The contractual relevance of the Guaranteed Completion Date comes into play in the calculation of the Delay Liquidated Damages under TC 54.8[548]:

> "54.8.1 Subject to TC54.8.1A, if the Contractor fails to achieve Mechanical Completion of all of the Units by the Guaranteed Completion Date, the Contractor shall be liable to pay Delay Liquidated Damages for each Day from the Day immediately following the Guaranteed Completion Date up to and including the date Mechanical Completion of all of the Units is achieved, at the following rates per Day:

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[543] JX-002, p. 170 ; JX-004, p. 155.
[544] Project Controls Execution Plan, Section 6.5.3; JX-002, pp. 469-471; JX-004, pp. 444-446.
[545] CB&I presented the October 2010 Re-Baseline Schedule in December 2010, which is over the 90-day limit; however, Reficar does not allege any breaches by CB&I in connection with this date of delivery.
[546] Ex. C-0058, pp. 15-21, 73.
[547] Ex. C-0058, p. 73.
[548] JX-002, p. 226; JX-004, p. 203.

> (i) at the rate of two hundred and sixty two thousand five hundred Dollars (US$262,500) per Day for the first 60 (sixty) Days of such delay; and then
>
> (ii) at the rate of five hundred thousand Dollars (US$500,000) per Day for each Day of such delay thereafter; provided that the aggregate amount payable pursuant to this clause (ii) shall not exceed thirty million Dollars (US$30,000,000)" [Emphasis added].

474. Another relevant date for the EPC Agreement was the Early Completion Date, which served as the basis for potential bonuses for CB&I if it finalized the works ahead of schedule[549] – alas, the provision did not come into play given the delays on the Project.

F. Liability cap

475. The liability cap in the Contract limits CB&I's total aggregate liability to Reficar under or in connection with the EPC Contract to USD 70 million under TC 8.1[550]:

> "8.1.1 The total aggregate liability of the Contractor to the Owner under or in connection with this Agreement (which includes, but is not limited to, (a) liability for Contractor default, (b) liability for Defects, (c) Delay Liquidated Damages payable under TC54.8 (other than those payable under TC54.8.1(i)), (d) Performance Liquidated Damages payable under TC56.2 and subject to the amount set forth in TC56.3.1, and (e) the Contractor's obligations to reperform any services or make good any deficient Work under TC71), will not exceed seventy million Dollars (US$70,000,000.00) [...]" [Emphasis added].

476. The USD 70 million cap could rise by a further USD 15.75 million, to a total of USD 85.75 million, if delay from the Guaranteed Completion Date accrued for 60 days, pursuant to TC 54.8.1(i):

> "54.8 Delay Liquidated Damages
>
> 54.8.1 Subject to TC54.8.1A, if the Contractor fails to achieve Mechanical Completion of all of the Units by the Guaranteed Completion Date, the Contractor shall be liable to pay Delay Liquidated Damages for each Day from the Day immediately following the Guaranteed Completion Date up to and including the date Mechanical Completion of all of the Units is achieved, at the following rates per Day:
>
> (i) at the rate of two hundred and sixty two thousand five hundred Dollars (US$262,500) per Day for the first 60 (sixty) Days of such delay [...]
>
> 54.8.2 Any amount payable pursuant to TC54.8.1(i) shall not count towards the Contractor's aggregate limit on liability set out in TC8.1.1" [Emphasis added].

477. CB&I's liability is thus contractually limited to a total of USD 85.75 million.

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[549] JX-002, p. 164; JX-004, p. 150; see also "Share-In Time Bonus", JX-002, p. 170; JX-004, p. 156.
[550] JX-002, pp. 180-181; JX-004, p. 166.

478. The liability cap would, however, not find application to six categories of liability specified under TC 8.1:

> "8.1.1 The total aggregate liability of the Contractor to the Owner under or in connection with this Agreement will not exceed seventy million Dollars (US$70,000,000.00) provided that the following liabilities (whether agreed or determined pursuant to TC46) shall not be taken into account in assessing whether the total aggregate liability (or any liability sub cap referred to in TC15.1.2, 54.8.3, 56.3.1 or 71.17) has been reached:
>
> (i) liability under any indemnity under this Agreement;
>
> (ii) liability for any insurance deductibles to be paid by the Contractor hereunder;
>
> (iii) liability arising from any fraud, Gross Negligence or Willful Misconduct committed by the Contractor;
>
> (iv) liability arising for a failure by the Contractor to comply with TC14.1 [failure to apply local law];
>
> (v) liability for any default interest which accrues due to the late payment by the Contractor of any amount provided for under this Agreement; and
>
> (vi) any amounts paid to the Owner under the Advance Payment Letter of Credit or any repayment made to the Owner of any advance payment made by the Owner to the Contractor".

479. Out of the scenarios above, the only relevant one in the current case concerns roman number (iii), *i.e.*, liability arising from fraud, gross negligence or willful misconduct. The Tribunal will analyse whether this provision finds application in subsequent sections of the Award.

VII.1.2. THE PARTIES' POSITIONS

1. REFICAR'S POSITION

480. Reficar argues that CB&I:

- induced it to agree to risk-shifting provisions under the cost-reimbursable modality of the EPC Agreement and its liability cap (**A.**);
- through a series of misrepresentations or omissions (**B.**) that amounts to a showing of *dolo incidental*;
- Reficar was in a position where it placed legitimate trust in CB&I (**C.**); and
- it could not have been expected to be aware of CB&I's deceptions (**D.**).

A. Inducement to switch from LSTK to RC Contract

481. Reficar avers that its original preference, as stipulated under the Project Definition Contract from 2007, was to obtain an LSTK contract. This is precisely why it engaged with CB&I[551].

482. Even though CB&I initially represented it would sign an LSTK contract with Reficar, upon experiencing losses on other projects CB&I decided to switch its practice to RC contracts to try to avoid further losses – at Reficar's expense[552].

483. According to Reficar, CB&I induced Reficar into signing an RC contract by emphasizing the considerable savings to be gained through changing the contracting modality – the RC estimate was almost a billion dollars lower than the LSTK one[553]. If not for CB&I's repeated representations of cost savings, the promise to deliver a Class 2 +/-10% AACE Estimate and a Level 3 Schedule, Reficar would not have agreed to the RC modality[554].

484. And when Reficar continued insisting on an LSTK estimate, in October 2009, Mr. Deidehban threatened Reficar with "drastic" changes if Reficar insisted on a LSTK estimate, which further induced Reficar to agree to the change in the contracting modality[555].

B. The misrepresentations

485. Reficar points to three essential misrepresentations made by CB&I: the Estimates did not adhere to Class 2 +/-10% AACE standards (**a.**), the Estimates were based on insufficient productivity multipliers (**b.**), and a deficient schedule was provided (**c.**).

a. No Class 2 +/-10% AACE standards Estimates

486. According to Reficar, no CB&I estimate could meet the AACE standards, because the classification system adopted by CB&I did not adhere to the requirements of the AACE; thus, the Estimates were not compliant with what had been agreed about their parameters[556].

487. The Estimates did not meet a +/-10% level accuracy either:

488. As regards the July 2009 Estimate, the deficiencies in the engineering and, especially, the lack of discipline drawings, made it impossible to reach a +/-10% accuracy[557].

489. In relation to the February 2010 Estimate, Reficar argues that CB&I knowingly presented false information about the alleged accuracy: it explicitly represented that said Estimate had a +/-10% level of accuracy, when it knew this to be incorrect –

[551] CPHB, para. 62.
[552] CPHB, paras. 39-42, 63-66, 71-72.
[553] CPHB, paras. 67-68, 70.
[554] CPHB, paras. 70, 72.
[555] CPHB, para. 69.
[556] CPHB, para. 82. CPHB, paras. 93-94.
[557] CPHB, paras. 80-81.

and in this arbitration CB&I has acknowledged that it was aware that the February 2010 Estimate did not have a +/-10% accuracy[558].

b. Insufficient productivity multipliers underlying the Estimates

490. CB&I knowingly used an insufficient productivity multiplier to artificially undervalue the estimate[559].

491. CB&I had internal knowledge that 3.0 was what the productivity multiplier should have been, as opposed to 1.86 (and 1.66), which were unilaterally decided by CB&I (or agreed to it)[560], with a deceitful purpose of lowering the estimate value[561].

c. Deficient Schedule

492. Despite multiple promises to provide a Level 3 Schedule[562], prior to the execution of the EPC Agreement, CB&I knowingly submitted a document which, in fact, only adhered to the requirements of a Level 2 Schedule[563].

C. Reficar legitimately relied on CB&I's representations

493. Reficar argues that it placed trust in CB&I as a renowned expert in engineering and construction – this meant that CB&I had superior knowledge of the refinery-construction business and was in a better position to know whether the Estimates and Schedule were accurate[564].

494. Reficar avers that its BofD relied on the Final Full Estimate and Level 3 Schedule when making its decision to approve the EPC Agreement[565]. This is clear from the multitude of prior Project documents CB&I was aware of, that emphasized the importance of CB&I's deliverables[566].

495. Even though the February 2010 Estimate had ROM numbers in it, Reficar argues that it could still have been a Class 2 +/-10% Estimate[567]. And the overstatement of the level of detail of the February 2010 Estimate, legitimately led Reficar to believe in the Estimate's accuracy[568].

496. Reficar maintains that, had its BofD been aware of the inaccuracy of the July 2009 and February 2010 Estimates and the Level 3 Schedule, it would never have signed the EPC Agreement on a cost-reimbursable basis, with the risk allocation that is prescribed under the Contract[569].

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[558] RPHB, paras. 101-102.
[559] CPHB, paras. 83-85.
[560] CPHB, paras. 104-107.
[561] CPHB, paras. 106-107.
[562] CPHB, para. 113.
[563] CPHB, para. 115.
[564] ESOC, paras. 2, 544, 762.
[565] CPHB, paras. 108, 114.
[566] CPHB, paras. 73-77, 112.
[567] CPHB, para. 96.
[568] CPHB, para. 97.
[569] CPHB, paras. 108-111, 114; Reply, para. 127.

D. Reficar could not have been aware of CB&I's deception

497. First, Reficar denies that, because of its professional position, it could not be deceived. Reficar submits that it is not a professional in the areas of engineering, procurement and construction that should have realised the misrepresentation[570], it is only a professional in the operation of refineries; thus, CB&I cannot shift the burden of obtaining correct information on Reficar[571].

498. Second, since Reficar had placed legitimate trust in CB&I due to the representations it had made, Reficar had, under Colombian law, a decreased duty to self-inform[572].

499. Reficar met that duty by having multiple advisors; but these advisors were not tasked with re-doing CB&I's work and did not have access to source data to warn Reficar of CB&I's deceit[573].

500. Third, there is no "duty to verify the information" as a corollary to the duty to inform, to the contrary of what CB&I's expert stated at the Hearing without offering proof other than this being his opinion[574].

2. CB&I'S POSITION

501. CB&I argues that it did not act with *dolo incidental* because:

- it did not induce Reficar into signing the RC EPC Contract (**A.**);
- it fully informed Reficar of the accuracy of its deliverables (**B.**) and, in any event,
- Reficar could not have been deceived as a professional because it was under the duty to self-inform, and in fact it was fully informed by its advisors (**C.**); and also
- Reficar did not rely on the July 2009 Estimate, the February 2010 Estimate Revision, or the Level 3 Baseline Schedule when making the decision to enter into the EPC Agreement (**D.**).

502. Finally, CB&I also avers that Reficar could not have suffered any damages under a *dolo incidental* scenario, because it simply paid the true cost of the Refinery (**E.**).

A. CB&I did not induce Reficar to sign the RC EPC Contract

503. According to CB&I, it was Reficar that approached it regarding the change in the contracting modality of the EPC agreement – not the other way around[575]; this alone would disprove the inducement theory.

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[570] CPHB2, pdf pp. 10-11 (line item 5 on p. 10).
[571] CPHB, paras. 51-52, 57; Reply, paras. 65, 72.
[572] CPHB, paras. 53-55.
[573] CPHB, para. 110.
[574] CPHB, para. 47, citing to Tr. 3903:8-3904:3; 3909:1-20.
[575] RPHB, para. 84.

504. As regards the risks in the switch from an LSTK to an RC EPC contract, CB&I avers that Reficar was fully informed on the issue and risks by its external advisors, independently of CB&I[576]. Additionally, CB&I tried to educate Reficar on the risk assumption by sharing the iChemE Green Book for Reimbursable Contracts with its representatives[577].

B. CB&I's did not make any misrepresentations

505. CB&I provided compliant estimates (**a.**), which did not require a Level 3 Schedule (**c.**). Additionally, Reficar was informed of the realistic productivity factors and forced them downwards (**b.**).

a. Properly represented estimates

506. The July 2009 Estimate was indeed a Class 2 estimate (**i.**) with +/-10% accuracy as represented (**ii.**)[578].

507. (i) The methodology used to arrive at the July 2009 Estimate did not strictly adhere to the AACE guidance but instead CB&I applied its own methodology, memorialized in the Estimate Plan, which called for deliverables which were greater in number and required more advanced maturity than those required by AACE[579].

508. In fact, Reficar's expert criticized CB&I's methodology at arriving at the Class 2 Estimate of July 2009, but itself used a flawed methodology, and failed to apply it correctly[580].

509. (ii) Foster Wheeler's independent estimate commissioned by Reficar was within USD 250 million of the July 2009 Estimate, further corroborating its accuracy at that point in time[581].

February 2010 Estimate

510. CB&I acknowledges that the February 2010 Revision to the July 2009 Estimate was not Class 2 +/-10%, neither was it intended to be; but Reficar knew this[582] and its own representatives explicitly referred to the February 2010 Estimate as a "reference document" only[583].

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[576] RPHB, paras. 74-76.
[577] RPHB, para. 80, citing to Tr. 1618:8-22.
[578] RPHB, para. 124.
[579] RPHB, para. 125-126.
[580] RPHB, para. 127, citing to Tr. 5137:10-22, 5145:21-5146:1; WMC ER, paras. 1098, 1106.
[581] RPHB, para.124, citing to Ex. B-042, p. 29 (Foster Wheeler estimate from August 14, 2009 at USD 3.229 billion).
[582] RPHB, paras. 129-133.
[583] RPHB, para. 98.

b. Reficar was aware of the more realistic productivity factors

511. Before releasing the July 2009 and February 2010 Estimates, CB&I had informed Reficar that 3.0 should in fact have been the correct multiplier[584].

512. Reficar was well informed of CB&I's data as it had its employees actively involved in the preparation of the estimate documents, and Foster Wheeler had calculated the productivity factor at 2.65 rather than the 1.66 in the February 2010 estimate[585].

513. The 1.66 productivity factor of the February 2010 estimate was a consequence of Reficar's aggressive pressure for the reduction in the productivity multipliers[586], as Reficar has conceded[587].

c. No Level 3 Schedule was required

514. According to CB&I, a Level 3 Schedule was not required prior to the EPC Agreement[588]. Reficar reviewed and approved the Level 3 April 2010 Schedule (that CB&I submitted regardless), which renders all of Reficar's arguments moot[589].

515. The Project Controls Execution Plan, which forms part of the EPC Contract, overwrote the Execution Masterplan and only foresaw a level 3 detailed working schedule 90 days after the contract award[590] and CB&I delivered the appropriate Level 3 Schedule, which was accepted by Reficar[591].

C. Reficar was well advised and could not have been deceived

516. Reficar (and Ecopetrol), as a sophisticated party ("professional") supported by a cadre of experts, engineers, consultants, and lawyers, could never be deceived by any purported statement CB&I made or omitted during the negotiation of the EPC Contract[592].

517. Furthermore, CB&I advised Reficar on the risks of cost-reimbursable contracts by providing Reficar's representatives with the iChemE Green Book for Reimbursable Contracts[593]. In any event, Reficar was bound by the duty of diligence, or to self-inform, which rendered any putative deceptions by CB&I impossible[594].

518. Reficar discharged the duty to self-inform hiring a number of external advisors, which gave Reficar full knowledge of the business risks it entered into[595]. Based on that information, Reficar freely agreed to changing the contracting strategy to a

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[584] RPHB2, para. 20-21.
[585] RPHB2, para. 23.
[586] RPHB2, para. 22.
[587] RPHB, paras. 103, 122.
[588] RPHB, para. 144.
[589] RPHB, para. 142.
[590] RPHB, paras. 141-142; citing to JX-002, p. 469, Section 6.5.3 ; JX-004, p. 444, Section 6.5.3.
[591] ESOD, para. 240,
[592] RPHB, para. 74, citing to *Glencore* RL-640.
[593] RPHB, para. 80.
[594] ESOD, paras. 1550-1553.
[595] RPHB, paras. 82,89.

cost-reimbursable contract[596]; in fact, it was Reficar who approached CB&I with the idea for an RC EPC Contract[597].

D. No reliance on the Estimates or April 2010 Schedule

519. Reficar did not rely on either the July 2009 or the February 2010 Estimates, or the April 2010 Schedule[598].

520. Reficar's BofD approved a Project budget of USD 3.777 billion, signed the LOI and directed EPC work to proceed in the fall of 2009 – months before Reficar received the February 2010 Estimate or the April 2010 Schedule[599].

E. No damage attached to the change in the remuneration scheme

521. CB&I argues that Reficar entered into an RC EPC Contract which established that only reasonable and proper expenses would be reimbursable[600]. And that is exactly what happened: Reficar paid the true cost of the Refinery[601]. Hence, there would be no damage attached to having entered the RC EPC Contract, even assuming but not conceding, that there had been misrepresentations on CB&I's side[602].

522. But even if some damage had arisen, Reficar has not proven that it was caused by any pre-contractual breaches: in fact, the damages sought by Reficar are extra costs incurred on the Project and loss of profit due to delay – almost the same damages as the ones sought in its contractual claims[603].

VII.1.3. THE TRIBUNAL'S DECISION

523. Claimant's case regarding pre-contractual liability is based on the allegation that CB&I acted with *dolo incidental* under Art. 1515 II of the CCC and breached the more general obligation to negotiate in good faith enshrined in Art. 863 of the Commercial Code. Reficar admits that, absent CB&I's deception and misrepresentation, it would indeed have entered into the EPC Contract, but it would have agreed to the Contract on other terms and conditions:

- it would have rejected the RC methodology touted by CB&I and instead would have insisted on the LSTK methodology originally envisaged and

- it would not have agreed to the cap to CB&I's contractual liability as it stands.

524. Reficar is not claiming annulment of the EPC Contract, but rather compensation for the damage suffered as a consequence of CB&I's devious conduct.

525. Respondents deny any responsibility. They say that they did not engage in any deception nor misrepresentation, and that Reficar agreed to the switch from an

[596] RPHB, para. 76, 86-88.
[597] RPHB, para. 84.
[598] RPHB, paras. 25-26, 137-138, 141, 144-145.
[599] RPHB, para. 96, RPHB2, para. 18.
[600] RPHB, para. 151.
[601] RPHB, para. 152.
[602] RPHB, para. 152.
[603] RPHB2, para. 28; RPHB, para. 147.

LSTK to an RC methodology at its own request, with full knowledge of the facts and properly advised by external experts.

526. The Tribunal will dismiss Claimant's claim by:

- first reviewing CB&I's pre-contract deliverables, *i.e.*, the July 2009 Estimate, the subsequent February 2010 Estimate and the April 2010 Schedule (**1.**),
- then establishing whether CB&I acted with *dolo incidental* (**2.** and **4.**), or
- whether it breached its pre-contractual duty to inform derived from good faith (**3.**)

1. ANALYSIS OF CB&I'S PRE-CONTRACT DELIVERABLES

527. In the course of the negotiations of the EPC Contracts CB&I prepared numerous estimates: by mid-2009 it had presented a total of five preliminary estimates, which then were followed by the July 2009 Estimate, which was revised twice, the second revision constituting the February 2010 Estimate.

528. CB&I also prepared and delivered to Reficar, before the execution of the EPC Contracts, various time schedules, including the so-called April 2010 Schedule, which set February 28, 2013 as the guaranteed Mechanical Completion Date and was the last work schedule exchanged before signature.

529. Claimant says that the July 2009 and February 2010 Estimates and the April 2010 schedule prepared by CB&I contained material and intentional misrepresentations – a claim which CB&I denies.

* * *

530. To adjudicate this question, the Tribunal will analyse each of the three deliverables separately (**1.2**, **1.3** and **1.4**), but before doing that, it will devote a separate section to the craft productivity factors ["**PFs**"] used in the Estimates (**1.1**).

1.1. THE PFS USED IN THE ESTIMATES

531. A key component of the July 2009 and February 2010 Estimates were the craft productivity factors used in these documents. These factors describe how efficiently craft workers (*i.e.*, skilled and qualified construction workers[604]) are able to perform their construction tasks; selecting higher or lower PFs has a profound impact on the estimation of the time, and by extension the costs, which the construction works will require. The higher the PFs, the lower the productivity in Cartagena, the more conservative the prediction and the higher the resulting cost estimate.

> *Pro memoria*: in accordance with common practice in the refinery construction business, the PFs used in the Estimates were based on the US Gulf Coast (1972) standard work hours ["**USGC**"], *i.e.*, the factor indicates how long it would take a worker on-site in Cartagena to perform the same task

[604] See e.g., TC 44.1; also ESOD, para. 698.

as a worker on the US Gulf Coast[605]. A PF of 2 signals that a Cartagena worker will need twice as many hours as a worker in the USGC to perform the same activity.

532. The July 2009 Estimate used a PF of 1.86 for greenfield work, with brownfield work being given 15% to 50% mark-ups to account for the interruptions caused by the on-going refinery operations[606]. The February 2010 Estimate reduced the PF for greenfield work to 1.66 (*i.e.*, it assumed a higher productivity than in 2009)[607], but retained the brownfield[608] mark-ups of between 15% to 50%[609].

533. Once construction of the Project finalized, and the true costs were established, it turned out that the PFs used in the Estimates were excessively optimistic (especially the 1.66 PF in the February 2010 Estimate, which overestimated the productivity in Cartagena by a factor of two). The Parties now discuss who should assume responsibility for setting the very low PFs in the July 2009 and February 2010 Estimates.

A. Reficar's position

534. Reficar argues that CB&I knowingly used underestimated craft PFs in the July 2009 and February 2010 Estimates.

535. First, Reficar argues that during the Hearing, CB&I's construction expert acknowledged that even though the average estimated craft PFs were set at 1.86 and 1.66 in July 2009 and February 2010, respectively, CB&I internally knew that the value should have been set at around 3.0, but failed to disclose this to Reficar[610].

536. Second, Reficar avers that the July 2009 PFs could not have been affected by any interference by Reficar and were deliberately undervalued on CB&I's own accord[611]. These multipliers were consistent with CB&I's representation in the Execution Masterplan, stating that productivity between 1.5 and 1.7 was achievable[612].

537. Third, as regards the multipliers used in the February 2010 Estimate, Reficar avers that CB&I agreed to them and therefore cannot claim that the multipliers were directed by Reficar[613].

B. CB&I's position

538. CB&I argues that the July 2009 Estimate craft PFs were lowered due to Reficar's insistence – but were still reasonable; the only unreasonable ones were those in the February 2010 Estimate, but they were imposed by Reficar.

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[605] Ex. C-0041, p. 22.
[606] Ex. R-0033, para. 8.1 at p. 19.
[607] Ex. C-0041, p. 22.
[608] Brownfield is the industry name used for existing facilities on a project.
[609] Ex. C-0041, pp. 22-23.
[610] CPHB, paras. 83-89.
[611] CPHB, para. 84.
[612] CPHB, para. 104.
[613] CPHB, para. 104.

539. First, CB&I argues that the July 2009 multipliers were aggressive, but reasonable given its local experience and the local surveys it performed in 2008[614]. The 1.86 PF was established on the basis of surveys conducted in 2008 and of the experience obtained by CB&I's from its other South American projects, located in Chile and Peru[615]; and the 15% to 50% mark-ups for the brownfield work brought the real PFs to between 2.14 and 2.79[616].

540. Second, CB&I argues that Reficar tried to contemporaneously control the estimated productivity multipliers, which means that CB&I cannot be held accountable for them being undervalued[617] This is especially the case with the February 2010 Estimate multipliers, which Reficar now agrees it imposed on CB&I[618].

541. Third, CB&I avers that it never "agreed" to the lowered PFs and made multiple caveats as to their understated nature[619].

C. Discussion

542. The determination of PFs is not an objective science. It is more in the nature of a "rule of thumb", a prediction based on previous experience and conditioned by the specific characteristics of the project. Multiple exogenous factors, which are difficult to quantify in advance (availability of skilled craft workers, configuration of the work site, vagaries of local weather, attitude of trade unions, local labour regulation…) are capable of provoking significant difference between the productivity, which was planned and expected, and that which is actually achieved.

543. The determination of which is the correct PF to be applied to estimate the cost of a specific refinery project, located in a certain country, is thus a highly subjective endeavour, in which the experience of the estimator plays an important role. This is proven by the wide range of PFs (from 1.6 to 2.65) which different experts proposed during the development of the Cartagena Project:

- First, it was CB&I who, at a very early stage of the relationship with Reficar, in August 2008, for the first time mentioned the possibility of achieving very aggressive productivity PFs, in the 1.6-1.7 range[620]. CB&I invoked its "unique expertise and experience", which would allow it to obtain improved PFs when compared with competitors[621]:

  > "CB&I is uniquely qualified to execute the expansion on an LSTK basis. We have relevant engineering experience on all the key process units, capability to perform the modular fabrication in house and experience with direct-hire construction in Colombia. We are one of the few (if any) companies that could adequately quantify and manage the risk and whose principal business model is lump sum turnkey contracting". [Emphasis added]

[614] ESOD, para. 136; also fn. 243 at p. 72.
[615] ESOD, para. 136; also fn. 243 at p. 72.
[616] RPHB2, para. 22.
[617] RPHB2, para. 22, footnote 68.
[618] RPHB, paras. 122, 135 (bullet point no. 4), 193-194 ; RPHB2, para. 22.
[619] RPHB, paras. 193-195.
[620] Ex. R-0029, p. 10.
[621] Ex. R-0477, p. 2.

- In the second half of 2008 CB&I conducted local studies and on the basis of contemporaneous projects in Chile and Peru, it came to the conclusion that the PF's would have to be increased to a range of 2.0-2.2.[622].

- When in September 2008 Pathfinder, acting on behalf of Reficar, prepared the draft Execution Masterplan, it still used the 1.5-1.7 PFs, originally touted by CB&I[623]. The final version of the Execution Masterplan, which was issued by CB&I in January 29, 2009, retained the same range of PFs[624].

- In March 2009 IPA, an expert retained by Reficar, prepared a presentation, which again used an average productivity in Colombia of 1.7[625].

- When Foster Wheeler reviewed the Synergy Changes proposed by Reficar and their impact on the Estimates, it assumed a higher multiplier of 2.65[626].

- CB&I, in its internal discussions, may have, at some point, used a multiplier as high as 3.0. CB&I's construction expert, Mr. Hillier, stated during his deposition that CB&I's employees had told him that a productivity of 3.0 might have been closer to reality[627]; he also confirmed that in his expert opinion a multiplier of 3.0 would have been appropriate[628].

- A Jacobs Consultancy [**"Jacobs"**] report from July 2012 prepared for Ecopetrol suggested that in Jacobs's experience, the proper PF for the Project was in the range of 2.2-2.25[629].

544. Finally, the actual productivity on the Project appears to have been in the range between 3.02 and 3.25[630].

* * *

545. Summing up, the PF used in the July 2009 Estimate (1.86 for greenfield work between 2.14 and 2.79 for brownfield) was already an optimistic prediction, on the lower end of the range of PFs. The February 2010 Estimate reduced the greenfield PF to 1.66 – the last Estimate thus used the lowest PF within the range. The actual PFs on the Project hovered above 3.0. The result was that the productivity of craft in Cartagena was undervalued by a factor of two.

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[622] Ex. R-0029, p. 10.
[623] Ex. R-0641, p. 33, 80.
[624] Ex. C-0024, pp. 18, 46.
[625] Ex. R-3662, p. 85.
[626] Ex. C-1273-REF0000142170, p. 20.
[627] Tr.: 6006:19-25.
[628] Tr.: 5979:11-18.
[629] Ex. R-0803, p. 8.
[630] Tr.: 5796:15-21: "[…] As part of his discussion on this topic, [Mr. Hillier] notes that he calculated the actual multiplier on the project and found it was 3.02". Reficar's expert, LI, instead of providing a Project craft productivity multiplier says that "cumulative site productivity ended up at about 0.51, compared to the planned Project productivity of 1.0", see LI ER, para. 767. Extrapolating this number from the February 2010 Estimate's PF of 1.66 gives a PF of 3.25, which is relatively close to 3.02.

a. Responsibility for undervalued multipliers

546. How could this happen?

547. Did CB&I *sua sponte* introduce the low PFs in the Estimates, or did it act at the request and with full knowledge of Reficar?

July 2009 Estimate

548. The first PF mentioned is a range of 1.5-1.7[631] recorded in the Execution Masterplan, which was prepared in draft form by Pathfinder (Reficar's consultant advisor)[632]. This number probably came from CB&I, but Reficar must have played a part in its calculation, because the Masterplan says that Reficar would provide to CB&I information[633]:

> "needed to quantify their risk such as Local Labour Studies, government contacts, insights on local labour [...] as may be available through REFICAR representatives' experience/knowledge". [Emphasis added]

549. CB&I warned Reficar that the PFs used in the draft Execution Masterplan were too optimistic and that a 2.0-2.2 range (a figure based on contemporaneous works in Chile and Peru) would be more appropriate – a fact proven by Pathfinder's subsequent report, which expressly refers to these warnings[634]. Despite CB&I's clear indications, the final Execution Masterplan left the PFs as they were and so, they remained at 1.5-1.7[635].

550. The evidence thus shows that the PFs in the Execution Masterplan originated from a draft prepared by an advisor of Reficar, were based on information provided by Reficar (or on its behalf) and that CB&I unsuccessfully tried to increase these PFs[636].

551. In the subsequent July 2009 Estimate, prepared by CB&I, the PFs were somewhat higher than in the Execution Masterplan – 1.86 for the greenfield work. There is no explanation in the file showing how this figure, slightly above the range consented by Reficar in the Execution Masterplan, was arrived at. The most likely explanation is that CB&I, who had warned that the PFs were undervalued, insisted on a moderate increase.

552. There is no contemporaneous evidence showing that Reficar disagreed either with the PFs in the Execution Masterplan or in the July 2009 Estimate.

February 2010 Estimate

553. The July 2009 Estimate was not decisive for Reficar's decision to enter into the EPC Contract. The Contract was executed 11 months thereafter, and during this

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[631] Ex. R-0641, p. 33, 80.
[632] See CPHB, para. 74: "Specifically, in September 2008, Pathfinder, a Reficar consultant, created a Master Project Execution Plan ("MPEP") [*i.e.*, the Execution Masterplan]".
[633] Ex. R-0641, p. 227.
[634] Ex. R-0029, p. 10.
[635] Ex. C-0024, pp. 18, 46.
[636] See evidence referenced in the two preceding paragraphs.

time CB&I prepared and delivered two revisions of the July 2009 Estimate, the last being the February 2010 Estimate, which used a PF of 1.66.

554. There is clear evidence that the decision to reduce the PFs from 1.86 to 1.66 originated from Reficar, and was resisted by CB&I.

555. The key piece of evidence is the February 2010 Estimate itself, which contains a chart that confronts the July 2009 PFs in the left column (which, blended, amounted to 1.86), with the February 2010 PFs (which, blended, amounted to 1.66), and underlines that these latter figures are "Client Directed", *i.e.*, imposed by Reficar[637]:

Div	Craft	PF 31Jul09	PF Client Directed
02	Civil Earthwork	1.66	1.46
02	Demolition Crewed Hours	1.66	1.46
03	Concrete	1.60	1.40
04	Architectural	1.77	1.77
05	Structural	1.77	1.57
07	Insul/Refract/Fireproof	1.77	1.77
09	Coatings	1.73	1.73
11	Major Equipment	1.89	1.85
13	Plate Structures	1.88	1.68
15	Piping	2.17	1.91
16	Electrical	1.85	1.68
17	Instrumentation	1.81	1.59
18	Start-up/Comm	1.95	1.85
20	Preservation	1.00	1.00

556. There is further evidence:

557. In January 2010 CB&I sent a mark-up of the draft EPC Contract to Reficar, stating that the PFs were imposed by Reficar and that CB&I had on several occasions warned that these numbers were low[638]. Reficar was not only aware of CB&I's warnings but agreed to CB&I's proposal not to include in the Contract any provision making CB&I liable for any discrepancies between the estimated and actual PFs on the Project.[639].

558. In a letter dated April 30, 2010 Reficar denied having imposed the February 2010 Estimate PFs[640]. In a responsive letter dated May 5, 2010 (*i.e.*, before execution of the EPC Contract) CB&I reiterated that the reduced February 2010 PFs resulted from cost-savings exercises performed by Reficar and were based on the most optimistic outcome and rates experienced by Ecopetrol rather than the average ones. The Contractor added that the undervalued PFs was one of the largest risk areas in the Project[641].

559. Being aware of CB&I's position, and with full knowledge that the PFs in the February 2010 Estimate were highly optimistic and represented a risk for the

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[637] Ex. C-0041, p. 22.
[638] Ex. R-0568, p. 5.
[639] Ex. R-0569, p. 371, under row "44.1.1".
[640] Ex. C-0314, p. 3.
[641] Ex. C-0315, p. 5.

successful completion of the Project, Reficar still decided to execute the EPC Contract.

560. The fact that it was Reficar who requested the very low 1.66 PF in the February 2010 Estimate is also accepted by Long International, Reficar's expert[642]:

> "Reficar, based on its own experience in the Colombian market, requested CB&I to utilize more aggressive productivity factors and unit workhours, which resulted in a lower estimate of EPC costs".

561. For this reason, in its damage calculations Long International gives CB&I credit for the difference between the productivity factor used in the July 2009 Estimate and the one in the February 2010 Estimate.

562. Summing up, the evidence shows that a wide range of PFs were used during the pre-contractual stage, and that estimates as high as 3.0 were discussed; the Tribunal, however, is convinced that Reficar:

- Requested that the (reduced) 1.66 PF be introduced in the February 2010 Estimate;
- Must have been aware that this figure was undervalued or at least overly optimistic, and
- Knew that the reduction represented a substantial risk factor for the successful completion of the Project within the cost Estimate.

b. Reficar's counterarguments

563. Reficar's response is that the 1.66 PF was not imposed but simply proposed by Reficar, and that CB&I agreed to its use[643]. Reficar also points to Mr. Houtz's witness statement, which confirms that between the July 2009 Estimate and its February 2010 Revision, "Reficar proposed and CB&I ultimately agreed to certain higher [risk] productivity factors"[644].

564. The Tribunal disagrees.

565. There is no contemporaneous evidence that CB&I acquiesced with Reficar's proposed PFs.

566. To the contrary. There is clear evidence that CB&I disagreed with the 1.66 PF:

- the February 2010 Estimate itself labels the productivity factor as "Client Directed"[645];
- CB&I also stated in January 2010, as it was negotiating the draft EPC Contract, that the PFs were imposed by Reficar and that it had warned Reficar on several occasions that these numbers were low – for this reason, CB&I

[642] LI ER, para. 1129-1131; LI Rebuttal ER, paras. 511-512.
[643] CPHB, para. 104.
[644] Houtz CWS, paras. 119-120.
[645] Ex. C-0041, p. 22.

would not agree to Reficar's contract proposal that "Productivity rate should be at CBI's risk" [646]; and

- CB&I's letter dated 5 May 2010 (one month before execution of the EPC Contracts) explicitly says that the PF used was based on feedback from Reficar, that it assumed the most optimistic outcome and that it represented one of the largest risk areas in the Project[647].

567. There is a second counterargument. As can be seen from the calculations of its own expert mentioned above, Reficar seems to accept that CB&I is not responsible for the difference between the PF of 1.86 (used in the July 2009 Estimate) and 1.66 (used in the February 2010 Estimate), but still maintains that CB&I should be responsible for the difference between 1.86 and the much higher actual PF achieved in the Project.

568. The Tribunal disagrees.

569. Although CB&I accepted that the 1.86 PF in the July 2009 Estimate was achievable, Reficar, a Colombian entity with experience in the Colombian labour market, also accepted that PF as realistic, notwithstanding the warnings by CB&I and its own advisors. Moreover, it directed a further reduction of such PF and ultimately accepted a specific provision in the EPC Contract (TC 44.1.1), in which CB&I warned of and declined responsibility for the risk that the actual PFs would surpass those in the Final Full Estimate (1.66).

1.2. THE JULY 2009 ESTIMATE

570. CB&I presented the July 2009 Estimate to Reficar at a value of USD 3.495 billion, excluding escalation and contingency[648], together with an Estimate Basis Document, which contained a breakdown of the methodology behind CB&I's calculations[649], and a separate document with a break-down of the numbers on a unit-by-unit basis[650].

571. The Estimate Basis Document confirms that the estimate meets the Class 2 +/- 10% accuracy[651]:

> "the July 31st EPC Estimate in accordance with the EPC Estimate Plan for the July 31st 2009, Class II (+/- 10%) Cost Estimate".

A. Reficar's position

572. Reficar says that the July 2009 Estimate clearly represented that it complied with AACE Class 2 +/-10% requirements. And just months before, in January, CB&I

[646] Ex. R-0568, p. 5.
[647] Ex. C-0315, p. 5.
[648] Ex. R-0524.
[649] Ex. R-0033.
[650] Ex. R-0525.
[651] Ex. R-0033, p. 7.

had made a presentation stating that it had "adopted the Cost Estimate Classification System provided by AACE"[652].

573. However, this representation turned out to be false:

574. First, the estimate was based on insufficient engineering progress[653]. Reficar's expert, Baker & O'Brien ["**B&OB**"] found that when the July 2009 Estimate was prepared, CB&I's engineering had only reached 21-27% of completeness[654], while the AACE requires a Class 2 +/-10% estimate to be based on engineering progress at approximately 55%[655].

575. Second, the engineering deliverables were not in compliance with the AACE requirements[656].

B. CB&I's position

576. CB&I avers that the July 2009 Estimate was in fact a Class 2 +/-10% estimate.

577. First, according to CB&I's expert, Watson Millican ["**WMC**"], the methodology chosen by Claimant's expert to evaluate whether the Estimate was a Class 2, *i.e.*, the percentage of completion of engineering, is flawed[657]. In any event, the percentage of engineering progress calculated by B&OB is undervalued, as it does not take into account the work performed by the other contractors[658].

578. Second, CB&I says that the July 2009 Estimate was not its sole responsibility, as it involved inputs from other contractors for nearly half the estimating scope[659].

579. Third, CB&I argues that the July 2009 Estimate was prepared in compliance with the agreed Estimate Plan, which only incorporated AACE guidelines as regards the numbering of classes, but established its own requirements for each of the classes, which differed from those of AACE[660].

580. Fourth, CB&I avers that the accuracy of the July 2009 Estimate is confirmed by the independent estimate commissioned by Reficar and prepared by Foster Wheeler in August 2009, which was within USD 250 million of the July 2009 Estimate[661].

C. Discussion

581. In this discussion, the Tribunal sides with Claimant.

582. CB&I makes a preliminary argument: it says that it only adopted the numbering convention of the AACE (*i.e.*, 1, 2, 3, 4 and 5), but not its substance. This averment,

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[652] CPHB, para. 82.
[653] CPHB, para. 80.
[654] B&O'B ER, para. 275.
[655] B&O'B ER, para. 275, Appendix E, paras. 28, 71, 78.
[656] CPHB, paras. 80-81.
[657] WMC ER, para. 1097.
[658] WMC ER, para. 1098.
[659] RPHB, para. 124.
[660] RPHB, para. 125.
[661] RPHB, para. 124, citing to Ex. B-042, p. 29; Tr. 1668:2-21.

however, is contradicted by its own "Guidelines on Cost Estimate Classification System", delivered to Reficar to explain to the Owner how the Constructor prepared its cost estimates. Para. 4.1. of these Guidelines specifically states[662]:

> "CB&I has adopted the Cost Estimate Classification System provided by AACE International (American Association of Cost Engineers)".

583. The AACE System includes not only five classes of estimates, but also very specific requirements for each of them. When a constructor says that it has "adopted the Cost Estimate Classification System provided by AACE", it is representing that the substantive requirements, which estimates have to fulfil to qualify for a certain class, are indeed met – otherwise, the reference to the classification system would be meaningless.

584. The Tribunal now turns to whether the July 2009 Estimate was or was not a AACE Class 2 +/-10% Estimate. The Tribunal finds that it was not, the reason being that the engineering deliverables prepared by CB&I were insufficient to meet the AACE requirements.

585. As a point of departure, the nomenclature used by the AACE for the maturity of deliverables comprises various levels of readiness[663]:

- a blank space means that progress has not started,
- an "S", standing for "started", means that work has begun but is limited to sketches, rough outlines or similar levels of early completion,
- a "P", standing for "preliminary" means that work on the deliverable is advanced. Contrary to ordinary meaning, preliminary in this context implies that development may be near completion except for final reviews and approvals. Thus, there is a considerable difference between "P" and "S", despite their semantic proximity,
- a "C", standing for "complete" means that the deliverable has been reviewed an approved as appropriate.

586. One of the categories of engineering deliverables are the discipline drawings, required to calculate the quantities and materials to be engineered, procured and installed[664]. According to B&OB, Claimant's expert, CB&I's progress in preparing these discipline drawings only met the status of "started" (which would correspond to a Class 3 estimate), rather than the status of "preliminary", as required by a Class 2 estimate[665].

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[662] Ex. C-0382, p. 2.
[663] WMC ER, para. 1057.
[664] Tr. 5027:5-7.
[665] B&O'B ER, Appendix E, paras. 87, 90.

587. WMC, Respondents' expert, disagrees with B&OB's findings. But WMC has prepared a chart with the maturity of the engineering deliverables, which in fact supports B&OB's position[666]:

Table 7.1 - Project Estimate Input Deliverables

	Item	CB&I Inputs	TPE Inputs	
			AACE	
		FEED Phase Deliverables	Recommended Practice 18R-97	Overall or Unit Specific
	Engineering Deliverables			
1	Process Flow Diagrams (PFDs)	X	C	Unit
2	Process and Instrumentation Drawings (P&IDs)	X	C	Unit
3	Utility Flow Diagrams (UFDs)	X	C	Unit
4	Electrical One-Line Diagrams	X	C	Unit
5	Plot Plans	X	C	Unit
6	Equipment Lists - Process/Mechanical	X	C	Unit
7	Equipment Lists - Electrical	X		Unit
8	Instrument List	X		Unit
9	Major Equipment Data Sheets	X	C	Unit
10	Standards and Specifications	X	C	Overall
11	Standard Detail Drawings	X		Overall
12	Hazardous Area Classifications	X		Unit
13	General Equipment Arrangement Drawings		C	Unit
14	Block Flow Diagrams		C	Overall
15	Heat and Material Balance		C	Unit
16	Spare Parts Listing		P	Overall
17	Mechanical Discipline Drawings		P	Overall / Unit
18	Electrical Discipline Drawings		P	Overall / Unit
19	Instrument/Control System Discipline Drawings		P	Overall / Unit
20	Civil/Structural/Site Discipline Drawings		P	Overall / Unit

588. The table shows the AACE requirements in the middle column, and in the left column, whether CB&I had or not complied with them (an "x" showing that compliance had been achieved, a blank that it had not).

589. In accordance with the findings summarized in the table, when CB&I prepared its July 2009 Estimate, its engineering was not sufficiently advanced for eight items (numbered 13 through 20). These include mechanical, electrical, instrument/control and civil/structural discipline drawings (items 17 through 20).

590. Apart from discipline drawings, the AACE Maturity Matrix also required a preliminary status of spare parts listings[667], which is missing in the above table under line number 16. By WMC's own count, the engineering was also lacking items 13-15, *i.e.*, general equipment arrangement drawings, block flow diagrams and heat and material balance.

591. Mr. Millican of WMC tried to argue at the Hearing, that the progress for discipline drawings did not need an "X", as the progress was implicitly accounted for under line 11, "Standard Detail Drawings"[668]. The Tribunal, however, is not convinced: if these items really were part of a previous line item, then they would not have been listed separately in the table. Additionally, this would still not account for the other lines that were missing sufficient progress, *i.e.*, 13-15.

592. WMC's own analysis shows that the July 2009 Estimate failed to include certain deliverables at the level required by the AACE: as a result, the Tribunal finds that the July 2009 Estimate was not AACE Class 2 as it purported to be.

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[666] WMC ER, p. 376 (source p. 369), Table 7.1.
[667] B&O'B ER, Appendix E, para. 86, Figure 12.
[668] Tr. 5317 :3-16.

CB&I's counterarguments

593. CB&I makes two counterarguments regarding the character of the July 2009 Estimate, namely that it cannot take responsibility for the entirety of the Estimate as it was a joint work product of multiple contractors (**i.**) and that the accuracy of the Estimate was confirmed by a separate estimate prepared by Foster Wheeler (**ii.**):

594. (**i.**) As regards the involvement of other contractors in the estimating process, CB&I cannot avoid responsibility. It was CB&I that had prepared the five prior estimates and was obliged to provide the July 2009 Estimate under the Project Definition Contract and the Execution Masterplan.

595. (**ii.**) CB&I, however, is correct in one aspect: Foster Wheeler, the expert hired by Reficar back in 2009, reviewed CB&I's July 2009 Estimate and decided that the budget could be adjusted downwards by some USD 0.25 billion[669]. The Tribunal agrees that this shows that, with the available information, an expert came to a conclusion, regarding the cost of the Project, similar to that of CB&I – but this does not mean that Foster Wheeler in any way endorsed that the July 2009 Estimate met the contractual requirements of accuracy and AACE-required parameters.

596. For the reasons above, the Tribunal dismisses CB&I's counterarguments.

* * *

597. In sum, based on the information on record, the Tribunal finds that the July 2009 Estimate did not adhere to the AACE Class 2 +/-10% accuracy level, because the engineering deliverables were not at the level required by AACE[670].

598. That said, the last deliverable presented by CB&I before Reficar's decision to execute the EPC Contract was not the July 2009 Estimate, but the February 2010 Estimate, which, together with certain BRNs, corresponded to the Final Full Estimate. This February 2010 Estimate will be analysed in the subsequent section.

1.3. THE FEBRUARY 2010 ESTIMATE

599. The Tribunal has already established that the July 2009 Estimate did not meet the Class 2 +/-10% accuracy level. The next question to address is whether the February 2010 Estimate did so.

A. Reficar's position

600. First, Reficar argues that the cover page of the February 2010 Estimate and cover correspondence refers to it as a Class 2[671]. In fact, it was rather a Class 3 or 4 estimate and CB&I should have disclosed it, but never did so[672]. Specifically, CB&I

[669] Ex. B-042, p. 29.
[670] The Tribunal need not enter into Reficar's fragmentary argumentation on the P80 character of the July 2009 Estimate raised at the Hearing at Tr. 5028:17-20 but not addressed in detail in Reficar's written submissions. Any putative finding would not change the Tribunal's decision on the accuracy of the Estimate.
[671] CPHB, para. 96.
[672] CPHB, paras. 93-94.

included no clarification, highlighting that the USD 500 million in cost reductions were ROM values and did not meet the +/-10% accuracy requirement[673].

601. Reficar finds support in Mr. Gachassin's testimony at the Hearing, who, when asked whether CB&I even informed Reficar about the non-conformity of the February 2010 Estimate with Class 2 requirements, replied "I can't point you to a specific location"[674].

602. Second, Reficar avers that it was not in a position to find on its own that the Estimate did not fulfil Class 2 +/-10% requirements.

603. Third, Reficar avers that on April 30, 2010, it reached out to CB&I to specifically enquire about the accuracy of the February 2010 Estimate Revision[675] and that the Contractor answered on May 5, 2010 with a deliberately ambiguous message[676].

B. CB&I's position

604. First, CB&I acknowledges that the February 2010 Estimate was not a Class 2 estimate[677], but avers that it was never represented as such[678], and that Reficar was well aware of this fact[679].

605. Second, Reficar had intimate knowledge of the February 2010 Estimate, as it reviewed it in depth, advised by Foster Wheeler[680].

606. Third, Reficar knew of the ROM values in the February 2010 Estimate, because it directed the Cost Reduction Workshops [previously defined as "**CRWs**"] and proposed the Synergy Changes resulting in the ROM values[681]. Moreover, CB&I sent a letter to Reficar on April 26, 2010, which specifically explains that certain items in the February 2010 Estimate were ROM figures[682].

C. Discussion

a. Development of the Project between July 2009 and February 2010

607. After CB&I had delivered the July 2009 Estimate, the Project suffered significant changes:

- Reficar carried out various CRWs, which resulted in significant modifications that reduced the overall cost of the Project;

[673] CPHB, paras. 96-97.
[674] CPHB, para. 95, citing to Tr. 2746:11-2747:12.
[675] CPHB, para. 99, citing to Ex. C-0314, p. 3.
[676] CPHB, paras. 100-101.
[677] ESOD, para. 232.
[678] RPHB, para. 98.
[679] ESOD para. 231, NESOD, para. 182.
[680] RPHB, para. 137, citing to Gachassin RWS, para. 145.
[681] RPHB, para. 129.
[682] RPHB2, para. 25, citing to Ex. R-0360, p. 1.

- Reficar also identified certain Synergy Changes, which required that the Project be amended, to increase the complementarity of the new refinery with other plants belonging to the Ecopetrol group.

CRWs

608. The CRWs led to a first cost reduction, which was reflected in the initial September Revision[683] of the July 2009 Estimate[684]. But the CRWs continued thereafter[685]. By the time of the February 2010 Estimate, these savings were calculated at some USD 501 million in total[686].

609. The changes in the Project which were to produce these cost savings were initially conceived as ROM (+/-50%) values, and required considerable work and time to be incorporated at a +/-10% accuracy level. By February 2010 CB&I was incapable of performing this task, and the February 2010 Estimate incorporates the changes identified in the CRWs using ROM values.

Synergy changes

610. Synergy Changes became one of Reficar's priorities in the second half of 2009, after Glencore had left the Project[687]. In a July 14, 2009 letter Reficar identified a first set of Synergy Changes and asked CB&I to include them in the July 2009 Estimate[688]. CB&I was, however, unable to do so in the two weeks left before the delivery July 2009 Estimate; thus, the July 2009 Estimate contains a separate section with ROM values for "Late Adds / Deletes / Changes" (and these values are not incorporated into the Estimate)[689].

611. Reficar says that CB&I had ample time to incorporate the Synergy Changes into the February 2010 Estimate, because discussion had started in July 2009[690], and by October Reficar had authorized CB&I to proceed with the required engineering[691].

612. Reficar's averment is a simplification of what really happened. Reficar's orders to change the design did not happen at once, but rather, in successive stages[692]:

- in July 2009 only the base case was adopted[693];

- in October 2009 the maximum propylene case was added[694]; and

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[683] The Tribunal notes that the September 3, 2009 Revision to the July 2009 Estimate is called Rev. 1 and the September 24, 2009 Revision is called Rev. 2. However, since the February 2010 Estimate is also called Rev. 2, the Tribunal understands that the September 24, 2009 Revision was an improved iteration of Revision 1, rather than a separate Revision 2. See Exs. C-0032, C-0033, C-0041.
[684] Ex. C-0032, p. 52.
[685] Ex. C-0033, p. 3.
[686] Ex. C-0031, p. 3.
[687] Ex. C-0398, p. 1; Ex. C-0173, p. 2.
[688] Ex. C-0399.
[689] Ex. R-0033, p. 21.
[690] ESOC, para. 226.
[691] Ex. C-0035.
[692] WMC ER, paras. 447-459.
[693] WMC ER, para. 452.
[694] WMC ER, paras. 453-456.

- in January 2010 the full burn FCC change was ordered[695].

613. These dates show that the last Synergy Changes were adopted barely a month before the February 2010 Estimate. The Tribunal finds that the tight time schedule again justifies that CB&I was unable to develop the new cost estimations, including the Synergy Changes, at a +/-10% accuracy level. Since the affected units accounted for 20% of the Project[696], the Synergy Changes had a significant impact on the accuracy of the February 2010 Estimate.

b. <u>Misleading elements in the February 2010 Estimate</u>

614. When CB&I issued its February 2010 Estimate it reiterated on the title page that the estimate was "Class 2 +/-10%"[697]:

reficar
Refinería de Cartagena S.A.

CARTAGENA REFINERY EXPANSION
PROJECT

CB&I Project # 42-168000

31 July 2009
Class II (+/- 10) Cost Estimate

Revision 2 – Final Estimate Scope

FEBRUARY 28, 2010

Copy Presented to: Masoud Deidehban

CBI

615. Notwithstanding what the title page appears to say, both Reficar and CB&I now acknowledge that this statement was not accurate and that the Estimate did not meet the Class 2 +/-10% threshold, (*inter alia*) because

- cost reductions of USD 501 million were estimated as ROM values, rather than as +/-10% estimations[698] (this impacted on some 20% of the total estimate value) and because

- the Synergy Changes were only partially incorporated[699].

616. Not only the title page is misleading. The lack of clarity is compounded by the content of the February 2010 Estimate itself.

---

[695] WMC ER, para. 457.
[696] Reply, para. 319, citing to B&OB ER, para. 207.
[697] Ex. C-0041, p. 2.
[698] Ex. C-0031.
[699] *See* Section VII.1.3.1.3 *supra*.

617. Clause 10 of the Estimate Basis Document acknowledges that "Late adds/Deletes/Changes" are established on the "basis of ROM Estimate", which is defined as "the most accurate methods possible", and then adds that "the costs noted on the Log have been incorporated into the EPC Estimate Costs". The log is attached as Annex 7, which consists in a long list of adds/deletes/changes, with a relatively modest monetary impact: USD 8.7 million.

618. Annex 7 thus provided the false impression that the only ROM figure incorporated into the 2010 Estimate amounted to USD 8.7 million. But this figure only includes the additional, very late adds/deletes/changes that arose when the July 2009 Estimate was being finalized and were not included in the Estimate[700].

619. CB&I could have resolved the mishap, when Reficar sent a letter dated 30 April, requesting clarification of 16 issues[701]. In Issue 12 Reficar voiced the doubt whether the February 2010 Estimate was indeed Class 2 +/-10%:

> "Based on the comments provided, we cannot confirm that this estimate meets the requirements of a +/-10% estimate" [702].

620. CB&I avoided confronting the question and rather gave a deliberately ambiguous answer, appearing to confirm the +/- 10% certainty, but at the same time sharing responsibility with Reficar:

> "CB&I would like to kindly remind Reficar that the planning and review of the EPC Estimate was a joint process between Reficar and CB&I-TPIT Consortium. The review and implementation of the estimate plan, procurement plan and many other key factors that supported the +/-10% estimate were approached by all Parties as a team"[703][Emphasis added].

c. CB&I's defense

621. The above facts do not shed positive light on CB&I's pre-contractual behaviour. CB&I, however, submits an important argument in defense of its conduct: it says that Reficar was perfectly aware that the design changes it requested after the July 2009 Estimate, to reduce costs and increase synergies, had been introduced at ROM level – making the Class 2 status illusory. There is evidence which supports Respondent's defense:

622. First, Reficar reviewed the February 2010 Estimate in detail, with the help of its advisor, Foster Wheeler. This is proven by the fact that on April 30 it sent a letter to CB&I[704], requesting information with a high level of detail, suggesting that it had a good understanding of the document.

623. Second and more importantly, there is documentary evidence that, after delivery of the February 2010 Estimate but before execution of the EPC Agreement, CB&I did convey to Reficar in its letter of April 26, signed by Mr. Deidehban the correct

[700] Ex. R-0033, p. 21.
[701] Ex. C-0314.
[702] Ex. C-0314, p. 3.
[703] Ex. R-0027, p. 4.
[704] Ex. C-0314.

information regarding the inclusion of ROM figures in the February 2010 Estimate[705].

624. The Contractor explicitly informed Reficar that the ROM estimates included in the 2010 Estimate were very substantial: they reached USD 671 million, composed of

- USD 501 million cost reductions, plus

- USD 170 million from Synergy Changes.

625. With this information an experienced entrepreneur in the oil business such as Reficar, with the professional advice of Foster Wheeler, must have been able to assume that, notwithstanding the designation included in the title page, the February 2010 Estimate could not meet the Class 2 +/-10% status.

* * *

626. In sum, the Tribunal finds that the February 2010 Estimate did not meet the Class 2 +/-10% requirement, notwithstanding the indication on its cover page. Reficar's design changes resulted in the inclusion of ROM figures which amounted to USD 671 million, composed of USD 501 million cost reductions identified in the CRWs and USD 170 million resulting from Synergy Changes requested by the Owner – making a Class 2 +/-10% category unachievable.

627. The available evidence shows that CB&I informed Reficar of this fact, and Reficar, who was advised by Foster Wheeler and who carefully reviewed the Estimate, must have been aware that ROM values in these amounts implied that the Estimate could not and did not meet the Class 2 +/-10% threshold.

628. That said, CB&I's conduct is not without blame. It should have eliminated the reference to Class 2 +/-10% from the cover page, and Mr. Deidehbah's letter, answering a direct question from Reficar, could and should have been less ambiguous.

1.4. THE APRIL 2010 SCHEDULE

629. Reficar claims that CB&I also deceived it as to the April 2010 Schedule, which was supposed to be Level 3 and resource-loaded, and which in fact did not meet these criteria.

630. Reficar argues that CB&I was required to provide a Level 3 resource-loaded schedule prior to the execution of the EPC Agreement[706]. According to Reficar, the April 2010 Schedule did not meet this requirement; in fact, it was only Level 2 and the resource-loading "bore no relation to CB&I's plan for the Work"[707].

631. CB&I says that Reficar's arguments on the Level 3 Schedule are based on the false premise that CB&I was obliged to prepare such schedule prior to the EPC

[705] Ex. R-0360, p. 1.
[706] CPHB, para. 112.
[707] CPHB, para. 115, citing to LI ER, Appendix 6E; CPHB2, pdf p. 11 at comments to para. 145.

Agreement – which it was not[708]. Regardless of the above, the April 2010 Baseline Schedule was a resource-loaded level 3 Schedule, as verified by CB&I's expert, Mr. Harvey[709].

632. The record shows that, from the outset of its relationship with CB&I, Reficar insisted that the Contractor eventually delivered a Level 3 resource-loaded schedule. The 2007 Project Definition Contract already included a Level 3 resource-loaded schedule among CB&I's key deliverables[710]. This was later reiterated in the 2008 FEED Execution Plan[711]. The Level 3 resource-loaded schedule was finally explicitly required under the 2009 Execution Masterplan, issued by CB&I[712].

633. The Execution Masterplan preceded the EPC Contract by some 18 months and during that time the parties discussed at length the schedule of the forthcoming works. These discussions intensified in the spring of 2010, in the lead-up to the execution of the EPC Agreements.

A. Reficar accepted the April 2010 Schedule

634. On March 3, 2010, Reficar notified CB&I that it was in breach of its obligation to provide a Level 3 Schedule (which according to the letter should have been delivered by February 26, 2010)[713].

635. A week later, during a weekly meeting with CB&I, Reficar reiterated that it had not yet received the Level 3 Schedule[714]. Reficar stressed that the February 2010 Estimate was deficient until it was synchronized with the Level 3 Schedule[715]. CB&I responded that it needed two more weeks to deliver the Schedule[716].

636. Following up on its promise, on March 25, 2010, CB&I delivered a preliminary Level 3 Schedule[717]. However, Reficar rejected it as incomplete on April 8, 2010 and submitted a number of comments[718]. Ultimately, CB&I submitted the so-called **April 2010 Schedule** (although the effective date of delivery seems to have been May 19, 2010[719]).

637. There is no evidence that Reficar voiced dissatisfaction with the document it had received. On the contrary, Reficar's agreement to this schedule was memorialized in CB&I's Monthly Project Report No. 7 of June 2010, which states that

[708] RPHB, para. 141.
[709] RPHB, para. 145; Secretariat ER, paras. 5.2.17-5.2.20; 5.2.46-5.2.51.
[710] Ex. R-0010, Schedule 3, para. 4.0 C.1, p. 89; Ex. R-0010, Schedule 3, para. 5.0 B.1, p. 89.
[711] Ex. C-0391, p. 14.
[712] Ex. C-0024, p. 115.
[713] Ex. C-0409.
[714] Ex. C-0410, p. 1.
[715] Ex. C-0410, p. 2.
[716] Ex. C-0410, pp. 1-2.
[717] Ex. C-1741.
[718] Ex. C-0050.
[719] Ex. C-0052.

> "[t]he EPC Level 3 Schedule was baselined and the Guaranteed Mechanical Completion Date of February, 28th 2013 was agreed upon by CB&I and Reficar"[720].

B. Agreement on the Mechanical Completion Date

638. An important issue during the discussions leading to the April 2010 Schedule was the definition of the date of finalization of the construction activity, with specified deliverables, contractually referred to as the Mechanical Completion Date. The same calendar date is also defined in the Contract as the Guaranteed Completion Date. The importance of this Date is reflected in the EPC Contract, under which it serves as the basis for the calculation of Delay Liquidated Damages[721] and the accrual of performance bonuses to the benefit of CB&I[722].

639. Prior to the April 2010 Schedule, CB&I had proposed May 21, 2013 as the Mechanical Completion Date[723]. However, Reficar pushed for an acceleration of this date, as visible in an April 8, 2010 letter[724]:

> "[F]or REFICAR is not acceptable to have May 21, 2013 as the mechanical completion date, as currently shown in the schedule received by us."

640. In the end, the Parties reached an agreement, establishing February 28, 2013 as the Mechanical Completion Date (and also the Guaranteed Completion Date)[725], as shown in the April 2010 Schedule, delivered on May 19, 2010. It is not clear when this agreement was reached exactly, but it must have happened within the April 8 and May 19 window. The EPC Agreement was signed only a month later, on June 15, 2010. This did not leave sufficient time for CB&I to prepare a final, Level 3 resource-loaded schedule, which could be annexed to the EPC Contract. Hence, the solution agreed upon by the Parties was

- To reflect the Mechanical[726] and Guaranteed Completion Date[727] of February 28, 2013 in the EPC Contract,

- And to insert CB&I's undertaking to deliver the Schedule, with the agreed upon Mechanical Completion Date, within 90 days of the execution of the EPC Agreement[728]:

> "[t]he detail working Schedule will be developed within the Project WBS and will be presented in bar chart format within 90 days of contract award".

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[720] Ex. C-0057, p. 12.
[721] JX-002, p. 226; JX-004, p. 203.
[722] JX-002, p. 164; JX-004, p. 150; see also "Share-In Time Bonus", JX-002, p. 170; JX-004, p. 156. These bonuses were based on the Early Completion Date, which in turn was set for a time prior to the Mechanical Completion Date.
[723] Ex. R-3183, p. 1.
[724] Ex. C-0050, p. 2.
[725] Ex. C-0058, p. 73.
[726] JX-002, p. 654; JX-004, p. 628; the Mechanical Completion for only the FCC Unit was April 30, 2013.
[727] JX-002, p. 166 ; JX-004, p. 152 ; Ex. C-0058, p. 73.
[728] JX-002, pp. 469-471 ; JX-004, pp. 444-446 (PCEP, section 6.5.3).

C. No deception

641. Reficar does not argue that CB&I breached its obligation to deliver the final Schedule, or that the final Schedule was defective. Reficar also does not argue that the April 2010 Schedule should have formed part of the EPC Agreements. Reficar's position is more nuanced: it says that it was deceived by the April 2010 Schedule.

642. The evidence does not support Claimant's averment:

643. First, for Reficar the most significant element of the April 2010 Schedule was the Mechanical Completion Date, as to which Reficar does not claim that it was deceived[729].

644. Second, while it had rejected earlier, less accurate drafts, Reficar did not object to the April 2010 Schedule when it received it.

645. CB&I has provided the following description of a Level 3 resource-loaded schedule [730], which in turn coincides with the AACE guidelines invoked by Reficar[731]:

> "Generally speaking, there are four levels of project schedules that one might see on a project the size and complexity of the Reficar project [...]. A Level 3 schedule would show work activities at the sub-area level by discipline". [Emphasis added]

646. Thus, for a schedule to be Level 3, it needs to show work activities at the sub-area level by discipline. In this case, the Level 3 Schedule was also to be resource-loaded, *i.e.*, be linked to the data underlying the Final Full Estimate for the Project[732].

647. The Tribunal agrees with Reficar that the April 2010 Schedule was not fully compliant with Level 3 resource-loading requirements.

648. That said, Reficar could have rejected CB&I's proposal, and postpone signature of the EPC Contracts until a fully compliant Level 3 Schedule had been delivered. But Reficar decided not to go this route: it preferred to agree to a firm Mechanical Completion Date (February 28, 2013), to waive the requirement that CB&I deliver a fully compliant Level 3 resource-loaded Schedule before executing the EPC Agreements, to substitute it by a commitment by CB&I to deliver the fully compliant Level 3 Schedule within 90 days and to immediately move the Project into the construction phase.

649. Thus, apparently, though not a Level 3, the April 2010 Schedule was good enough for Reficar at that time. This was confirmed at the Hearing by Reficar's expert,

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[729] Ex. C-0058, p. 73.
[730] ESOD, p. 108, footnote 411.
[731] Ex. C-0384 at p. 62 (source p. 61).
[732] CPHB, para. 112, referencing Mr. Deidehban's agreement with such definition at Tr. 923:1-7.

Mr. Warhoe[733] and in the Long International Report[734]; there is also evidence that Foster Wheeler accepted the April 2010 Schedule[735].

650. Third, in the EPC Contract Reficar agreed to extend CB&I's time to prepare and deliver a Level 3 Schedule until 90 days after the signature of the Contract. Reficar is thus precluded from arguing that CBI breached the obligation, established in the Execution Masterplan, to deliver a Level 3 resource-loaded schedule prior to the EPC Agreement[736].

651. On the basis of the above, the Tribunal finds that while a Level 3 resource-loaded schedule was indeed very important to Reficar in the initial stages of the Project, Reficar's outlook changed in the face of the approaching date of EPC Contract execution:

- Reficar agreed to postpone a detailed and complete schedule until after the Contract execution; thus, Reficar's consent did not rely on the April 2010 Schedule;

- Reficar accepted the April 2010 Schedule with a Mechanical Completion Date that adhered to its expectations.

* * *

652. In sum, Reficar has argued that CB&I, purposefully provided incorrect (i) PFs, (ii) July 2019 and (iii) February 2010 Estimates and (iv) April 2010 Schedule.

653. The Tribunal, however, has found that:

- (i) it was Reficar who had full knowledge of and requested the use of unrealistic PF;

- (ii) the July 2009 Estimate did not adhere to the AACE Class 2 +/-10% accuracy level, but was not decisive on Reficar's decision to execute an RC contract;

- (iii) the February 2010 Estimate was not a AACE Class 2 +/- 10% accuracy level, but Reficar was aware of it when it decided to execute an RC contract;

- (iv) the April 2010 Schedule was not a Level 3 Schedule, but was acceptable to Reficar and, in any event, it was not decisive on Reficar's decision to execute an RC contract.

654. Having found the above, the Tribunal must now determine whether CB&I's pre-contractual conduct, when it provided the above information, constitutes *dolo incidental*, as Reficar avers.

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[733] Tr. 4611:17-4612:12.
[734] LI ER, para. 440.
[735] See *e.g.*, Ex. R-0810, pp. 4, 11, where Foster Wheeler discusses the April 2010 Schedule with May updates as the baseline.
[736] RPHB, paras. 141, 144.

2. DOLO INCIDENTAL

655. Claimant's main case regarding pre-contractual liability is based on the allegation that CB&I acted with *dolo incidental*: Reficar says that by using deception and misrepresentation CB&I induced it to switch the EPC Contract from an LSTK to an RC methodology and to agree to a liability cap. Reficar admits that, absent CB&I's improper conduct, it would indeed have entered into the EPC Contract, but it would have agreed to the Contract on other terms and conditions.

656. Reficar is not claiming annulment of the EPC Contract, but rather compensation for the damage suffered as a consequence of CB&I's allegedly devious conduct, under the specific rules governing *dolo incidental* in Art. 1515 II of the CCC.

657. Reficar says that it was misled by CB&I into believing that the PFs were accurate, the two Estimates complied with previously agreed AACE Class 2 +/-10% requirements and that the April 2010 Schedule was Level 3 and resource-loaded; based on this information, Reficar agreed to switch to an RC EPC Contract; had its BofD been aware of the inaccuracy of the Final Full Estimate and the Level 3 Schedule, it would not have signed the EPC Agreement on a cost-reimbursable basis, with the risk allocation that is prescribed under the Contract, nor to a liability cap[737].

658. Reficar offers the witness statements of:

- The former president of Reficar's BofD, Mr. Javier Gutiérrez[738]:

  "If I had known the estimate was false, I would never have approved the signing of the EPC Contract under the conditions that it was signed";

  "I would not have approved the risk-shifting terms of the EPC Contract, such as the cost-reimbursable structure or the liability cap in TC 8.1",

- Carlos Bustillo – former vice-president of the Project[739]:

  "CB&I's representations regarding its experience, its "Class 2" cost estimate […], the benefit of a cost reimbursable approach, and the limited impact of [the Synergy Changes] were all necessary to Reficar's authorization for the Project",

- and Felipe Castilla – former vice-president of finance and administration[740]:

  "Reficar only agreed to any type of limitation because CB&I provided what they represented as a Class [2] +/–10% estimate […] for the Project".

Overview

659. The Tribunal will establish that an accurate cost Estimate was indeed highly important to Reficar. In fact, it was so relevant, that Reficar became deeply involved

[737] CPHB, paras. 108-111, 114; Reply, para. 127.
[738] Gutierrez CWS, para. 45; Gutierrez CWS II, para. 15.
[739] Bustillo CWS, para. 49.
[740] Castilla CWS, para. 28.

in the estimating process, and undertook so many efforts in independently assessing its own budget, which differed from CB&I's Final Cost estimate, that it was unlikely that Reficar could be deceived by CB&I.

660. When the signing of the EPC Contract approached in early 2010, the Project suffered significant scope changes, introduced at Reficar's behest, in an effort to reduce costs and to increase synergies. This implied, as Reficar must have known, that the Final Full Estimate would not reach +/-10% accuracy, and that its contractual relevance became minimal: the EPC Contract ultimately does not include any representation nor any guarantee by CB&I regarding the accuracy of the Final Full Estimate.

661. Given Reficar's involvement in the preparation of the Estimates, its responsibility for the late scope changes and its ultimate limited reliance on the Final Full Estimate, considering the Final Full Estimate in its entirety, it is impossible for Reficar to claim that it was deceived by CB&I.

662. The same applies to the April 2010 Schedule, which was not attached to the EPC Contract nor guaranteed by CB&I; instead, Reficar granted CB&I 90 days after the execution of the Contract to provide a proper Level 3 resource-loaded schedule – and there is no allegation that CB&I failed to comply with its obligation.

663. Summing up, the Arbitral Tribunal is convinced that, when Reficar took the decision to change from an LSTK to an RC Contract, it did not act under the inducement of *dolo incidental.* To substantiate this conclusion, the Tribunal will first summarize Colombian law applicable to *dolo incidental* (**2.1.**), then establish that Reficar was not tricked by CB&I into switching to an RC Contract (**2.2.**), and that in any case Reficar has failed to prove the causality of its *dolo incidental* claim (**2.3.**) and that the RC EPC Contract it agreed to offered no less beneficial contractual terms to Reficar (**2.4.**). Finally, the Tribunal will reach its conclusion (**2.5.**).

2.1. APPLICABLE LAW

664. *Dolo* is a polysemic concept, which is used to qualify conduct in a variety of situations, in civil, administrative and criminal law.

665. *Dolo* is the conduct, adopted during the negotiation or the performance of a contract, where one party is aware and accepts that such conduct will result in the detriment of the counter-party. In this civil context, the Colombian Civil Code [previously defined as the "**CCC**"] provides the following definition of *dolo* in the final sentence of Art. 63[741]:

> "*Artículo 63.*
>
> [...]

[741] CL-0013.

> *El dolo consiste en la intención positiva de inferir injuria a la persona o propiedad de otro*"[742].

666. A contracting party can commit *dolo* both before entering into a contract, and after having done so:

- In a pre-contractual scenario, while the contract is being negotiated, *dolo* refers to the conduct which deliberately induces the other party's consent through machinations, artifices, false statements, insidious words or even omissions; it is this type of *dolo* which will be analysed in this section.

- In a contractual scenario, once the contract has been signed and while it is being executed, *dolo* describes a party's willful contractual breach or serious disrespect for contractual obligations – this contractual *dolo* will become relevant *infra* when assessing the contractual breaches claims.

Pre-contractual *dolo*

667. Pre-contractual *dolo,* which occurs before the execution of a contract, while negotiations between the parties are ongoing, is regulated in Art. 1515 of the CCC:

> "*Artículo 1515. DOLO.*
>
> *El dolo no vicia el consentimiento sino cuando es obra de una de las partes, y cuando además aparece claramente que sin él no hubiera contratado.*
>
> *En los demás casos el dolo da lugar solamente a la acción de perjuicios contra la persona o personas que lo han fraguado o que se han aprovechado de él; contra las primeras por el total valor de los perjuicios y contra las segundas hasta concurrencia del provecho que han reportado del dolo*"[743].

668. The CCC does not provide a definition of this type of pre-contractual *dolo.* It simply states that:

- this type of conduct, deployed during the negotiation of a contract vitiates the consent of the counter-party, if were it not for the existence of *dolo* the counterparty would not have entered into the contract; this type of dolo is normally referred to as *dolo causal*, *principal* or *determinante* (because it causes the nullity of the contract);

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[742] English translation from RL-317:
"Article 63.: […]
Fraud consists of the willful intention to inflict injury upon an individual or the property of another".

[743] Translation taken from RL-387:
"Article 1515. Deceit [*dolo*] does not vitiate the consent when it is on behalf of one of the parties, and also when it is clear that without it, there would be no contract.
In other cases, a defect [*dolo*] only gives rise to the action of damages against the person or persons who have forged it, or who have taken advantage of it; against the former for the total value of the damages, and against the latter up to the profit obtained from the defect they reported".

- while in all other cases, the validity of the contract is not affected, but the aggrieved party is entitled to damages; this is the so-called *dolo incidental* (because it gives rise to an incident in the contract's life).

669. The CCC does not give a precise definition of what type of conduct, performed before the contract is executed, gives rise to pre-contractual *dolo*. Guillermo and Eduardo Ospina Fernández, respected authors quoted by both Reficar's and CB&I's experts[744], reflect the unanimous understanding of what constitutes pre-contractual *dolo* in Colombian civil law[745]:

> "*[C]ualquier maquinación, trampa, artificio o astucia encaminados a sorprender a la víctima y a provocar su adhesión, bien sea sobre el acto en general, bien sea sobre ciertas condiciones de él; consiste, pues, en crear en la mente de una persona, mediante procedimientos condenados por la buena fe, un móvil o razón para consentir, móvil o razón que en realidad no existe, que es ilusorio y pernicioso*"[746] [Emphasis added].

670. *Dolo*, in a pre-contractual phase, is thus

- the trickery, deception, machination or misrepresentation employed by one party,

- with the aim of convincing a counter-party to enter into a contract with it on certain terms and conditions,

- something to which the counterparty, absent the devious conduct, would not have agreed to (*dolo causal*), or would have agreed to on different terms and conditions (*dolo incidental*)[747].

671. *Dolo* may take the form of false representations, but it may also appear by omission, this is, by concealing the truth – this latter *dolo* is referred to as negative *dolo*[748] or *reticencia dolosa*[749].

672. The consequences of a party deceiving the counter-party to enter into a contract on certain terms and conditions, are radically different, depending on whether the conduct qualifies as *dolo causal*[750] or as *dolo incidental*:

- If the counter-party can prove that, absent the trickery, deception, machination or misrepresentation, it would never have entered into the contract, the *dolo* is *causal* and vitiates the consent, the basic requirement for

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[744] RL-455; CL-081.
[745] CL-081, p. 4 (source page 202), para. 232.
[746] Translation from RL-455, p. 18:
"[a]ny kind of contrivance, trap, ploy or trick intended to surprise the victim and win their trust, whether this relates to the general act in general, or certain conditions of it; it consists, therefore, of creating in the mind of a person, through methods considered not to be in good faith, a motive or reason to consent, which in reality does not exist, which is illusory and harmful".
[747] "*Astucia o engaño para sorprender el consentimiento de la victima*". CL-039, p. 6 (source page 796).
[748] ESOC, para. 552, citing to Solarte ER I, para. 131.
[749] CL-041, p. 11.
[750] Also referred to as *dolo principal*. See e.g. JER 8 on Colombian law, issue 28.

the existence of a binding agreement, which is free will, falls away, and the counter-party can claim annulment of the contract plus damages[751];

- In the other situations in which the conduct of one party that, although not decisively influencing the affected party's consent to enter into the contract, induces the other party to accept terms more onerous that it would have accepted, the *dolo* is *incidental*, and the only remedy available to the counter-party is to claim damages against the devious party (including third parties who have benefitted); the damages are calculated by comparing an as-is situation (the terms and conditions of the contract actually executed), with a but-for situation (the terms and conditions which the counter-party would have accepted, absent the other party's devious conduct).

673. Summing up: *dolo* will become *dolo incidental* when the victim's consent to enter into the agreement was not vitiated, but wrongfully influenced as regards the terms and conditions of the contract: the victim would have entered into the contract in any event, with or without unlawful inducement (hence, no *dolo causal*), but it would have agreed to better conditions than those accepted by means of the trickery[752]. The consequence of *dolo incidental* is that the contract is valid, but the victim is entitled to damages (determined as the difference between the conditions it actually agreed and the conditions it would have agreed absent *dolo*).

A textbook example

674. A handbook example of a trickery which may lead to *dolo causal* or to *dolo incidental* is that of the sale of the horse Pegasus.

> Flavius wishes to buy a horse and Ticius shows him Pegasus, stating that Pegasus has won the latest Roman derby. Convinced of the horse's strength and speed, Flavius buys Pegasus for 200 denarii. Alas, once the purchase is made, Flavius finds out that Pegasus never won any derby and, in fact is a rather weak and slow horse. If Flavius had bought Pegasus with the intention to use it as a racing horse, Flavius's consent would have been vitiated by Ticius's malicious representations regarding Pegasus's features, and there would be *dolo causal* voiding the contract. Had, however, Flavius intended Pegasus to be a surprise addition for his farm, to entertain his granddaughters, he would have acquired Pegasus anyway, because, despite its weaknesses, it still is a beautiful horse, but would have paid only 125 denarii, the market price for a regular horse – the extra cost incurred was a consequence of the *dolo incidental,* the contract is not voided (but rather confirmed) and the difference between both prices can be recovered by way of damages.

675. In the present arbitration, the Tribunal will only scrutinize whether CB&I acted with *dolo incidental,* as Reficar argues that, absent CB&I's devious conduct, it would have agreed to the EPC Agreement but under different terms; Claimant does not contend that the negotiation and execution of the EPC Agreement were tainted by *dolo causal*, and that it would never have entered into an EPC Agreement, had it not been for CB&I's *dolo*.

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[751] See RL-387; CCC, Art. 1515, in full in para. [667] *supra*.
[752] See JER 8 on Colombian law, issues 34-35.

2.2. NO EVIDENCE OF DEVIOUS CONDUCT

676. *Dolo incidental* can thus be summarized as:

- the trickery, deception, machination, misrepresentation or omission deliberately employed by one party,

- with the aim of convincing a counter-party to enter into a contract on certain terms and conditions,

something to which the counterparty, absent the devious conduct, would have agreed to but on different terms and conditions.

677. Reficar says that CB&I's devious conduct induced it to change the EPC Contract from an LSTK to an RC methodology and to agree to a liability cap.

678. Reficar argues that it was not aware of the flaws in the July 2009 and February 2010 Estimates and April 2010 Schedule because it had placed its legitimate trust in CB&I as the expert in engineering and construction[753]. Reficar avers that it only operates refineries, which allowed it to fully rely on CB&I's engineering and construction expertise[754]. According to Reficar, CB&I had superior knowledge of the refinery-construction business and was in a better position to know whether the Estimates and Schedule were accurate[755].

679. As an initial point, the Tribunal agrees with Reficar when it argues that, unlike CB&I, it is not an expert in engineering and construction of refineries. Thus, CB&I was the expert in the relationship and CB&I would have a heightened duty to properly inform Reficar and to provide it with accurate deliverables.

680. That said, Reficar is a highly experienced operator of refineries:

- it was Reficar who developed cost saving and synergy improving measures; it was Reficar who ordered CB&I to introduce multiple last-minute changes to the design of key units on the Project; the capability of Reficar's team of in-house engineers is undisputed;

- the record also shows that Reficar employed its own group of estimators, employees who were physically inserted in CB&I's Houston offices;

- finally, Reficar retained multiple specialized external advisors, including Pathfinder, IPA and Foster Wheeler, who reviewed the Estimates at multiple stages and prepared various reports and recommendations on the estimating process, including a control calculation for the July 2009 Estimate[756].

681. These factors act as countervailing factors, off-setting CB&I's heightened duty as a constructor.

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[753] CPHB, paras. 110-111, 114; Reply, para. 67.
[754] CPHB, paras. 51-52, 57; Reply, paras. 65, 72.
[755] ESOC, paras. 2, 544, 762.
[756] Ex. B-042, p. 29.

682. In the present case, even taking into consideration CB&I's heightened duty of candour as a professional constructor, the Tribunal finds that Reficar has failed to prove that it was deceived by CB&I to change the EPC Contract from an LSTK to an RC methodology and to agree to a liability cap:

- it was Reficar who initiated the negotiations for the contracting change (**A.**), and
- Reficar was fully advised on the subject by a multitude of objective sources (**B.**).

683. Furthermore, Reficar could also not have been deceived by CB&I's deliverables, because Reficar

- entered into the EPC Agreement on the basis of its internal budget and not the Estimates (**C.**);
- directed the PFs underlying the Estimates (**D.**);
- was intimately involved in the preparation of the Estimates (**E.**);
- directed last minute scope changes that made accurate estimations impossible (**F.**);
- did not consider the Final Full Estimate to be a source of substantive obligations under the EPC Contract (**G.**); and
- did not rely on the April 2010 Schedule in its decision on the EPC Agreement (**H.**).

A. Reficar initiated the negotiations to switch from LSTK to RC

684. The first formal approach to explore a potential switch from LSTK to RC was taken *motu proprio* by Reficar in July 2008, based on truthful information provided at the time by CB&I and confirmed by Claimant's experts.

685. In May 2008, CB&I informed Reficar that an LSTK price would have to include a premium of between 10% and 40%, thereby increasing the contract price from USD 3.5-4.8 billion to USD 4.3-5.5 billion[757]; the premium had become necessary due to highly volatile market conditions (2008 was the year when the financial crisis exploded). The information provided by CB&I was correct – there is no evidence in the file proving otherwise. CB&I's representative offered to meet with Reficar

> "to discuss CBI's consensus regarding the potential impact of escalation, continued scope growth and contracting strategy on this estimate"[758].

686. Reficar's Mr. Houtz has stated that he had an informal conversation with CB&I's Mr. Sipes on a flight in the spring of 2008, in which the latter disclosed that

[757] Ex. R-0484, p. 2.
[758] Ex. R-0484, p. 1.

> "CB&I wanted Reficar to agree to a cost-reimbursable contract, and that by doing so, Reficar would save considerable money"[759].

687. In June 2008, Reficar's Steering Committee met to examine the different contracting strategies for the Project. In view of the price increase that an LSTK contract implied, the Steering Committee concluded that the LSTK strategy was no longer the optimal approach, with RC contracts offering considerable savings by comparison[760].

688. Also in June 2008, Reficar's highest administrative body, the BofD met. The BofD had representatives of both shareholders at the time, *i.e.*, Ecopetrol and Glencore. The discussion of an "[u]pdate of the revision of the contracting strategy of EPC" was put on the agenda[761], Reficar's President, Dr. Richard Cohen, made a presentation and at the end no decision was taken, except to order management to study the issue in depth[762].

689. To make an informed decision on the change, and to comply with the instructions given by its BofD, Reficar retained Pathfinder, a respectable consultancy, to evaluate the alternative contracting strategies[763].

690. On July 9, 2008, Pathfinder made an assessment of the Project in which it found that "a satisfactory LSTK arrangement may not be achievable"[764] and

> "that the best recommendation was for reimbursable contracting arrangements, particularly when reinforced with effective Incentive Programs"[765].

The consultant concluded that the option of immediately shifting to an EPC Reimbursable Cost Contract "clearly appear[ed] to be the preferred Case!"[766].

691. The following day, Reficar's Steering Committee met again and was given another presentation on the subject of contract modality[767]. The presentation stressed that CB&I did not support an LSTK basis[768] and that the market conditions had changed, leading to possible additional costs of over USD 500 million in LSTK[769]; furthermore, the cost margin in the LSTK modality was forecasted to be 10% higher

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[759] Houtz CWS, paras. 87-88.
[760] Ex. C-0928, p. 44. The Tribunal notes that the Agenda slide of the presentation, at p.2, mentions that the relevant section of the presentation was made by "EH", which must mean Mr. Ernest Houtz, who at that point was an employee of Glencore; Mr. Houtz claims that the Steering Committee at the time was comprised mainly of Glencore representatives and that no members of Ecopetrol were on the Steering Committee as Ecopetrol had not yet re-purchased Glencore's shares in the Project, see Houtz CWS, para. 90.
[761] Ex. R-0489, p. 2 at. 2.5, pp. 3-4 at 5.
[762] Ex. R-0489, p. 4.
[763] Ex. C-0012, p. 2: "Whereas the original plan was to obtain LSTK bids from both contractors, we are now considering executing the project on a cost plus basis, with CBI and Technip operating as a consortium during the execution of the rest of the basic design and the EPC phase."
[764] Ex. R-0487, p. 6.
[765] Ex. R-0487, pp. 7-8.
[766] Ex. R-0487, pp. 9, 14.
[767] Ex. C-0930, p. 63; see also Ex. R-0455, p. 73.
[768] Ex. C-0930, p. 75.
[769] Ex. C-0930, p. 72.

than that for a reimbursable cost contract[770]. The Steering Committee urged the BofD to make a speedy decision[771].

692. In view of the Steering Committee's request, on July 15, 2008 Reficar's BofD again discussed the strategy for the EPC Contract, on the basis of a presentation by Dr. Cohen[772]. He explained that the anticipated surcharge for an LSTK option would amount to USD 500 million[773]. The BofD[774] authorized management to meet and confer with CB&I to discuss a cost plus EPC contract option.

693. This was the first official approach by either of the Parties to commence negotiations on a possible change of the contracting strategy.

694. The facts show that the decision to start a negotiation with CB&I, which would after almost two years lead to the signing of the RC EPC Agreement, was initiated by Reficar, with strong support of its own President, on the basis of truthful information provided by CB&I, and confirmed by an independent expert, retained by Reficar to make an informed decision. The underlying reasoning was that in volatile market conditions, an LSTK required a very substantial premium, and that a properly negotiated RC contract could result in considerable cost savings.

* * *

695. On the basis of the above, the Tribunal finds that Reficar was not deceived by CB&I to switch to RC contracting, as it was Reficar who took the initiative to commence negotiations to change the contract modality, based on objectively true information, confirmed by Reficar's own expert, that, at that highly volatile time, RC contracting offered considerable cost reductions to the Project.

B. Multiple sources of information

696. Reficar relied on many sources to form its opinion on the appropriateness of the change in the contracting modality; CB&I was only one of those sources. Other sources of Reficar's knowledge included:

- the other major contractor on the Project, Technip, who made it clear it was reluctant to proceed with an LSTK EPC Contract[775];
- the external consultant Pathfinder, who provided a study proving the superiority of the cost-plus option at the time[776];

[770] Ex. C-0930, p. 75.
[771] Ex. C-0930, p. 75.
[772] Ex. R-0492.
[773] Ex. C-0014, p. 5; Ex. R-0492, p. 6.
[774] Ex. C-0014, pp. 5-6.
[775] Ex. R-0503.
[776] Ex. R-0487, pp. 8-9, 14, 17. Reficar has conceded that "in light of its independent diligence through Pathfinder, Reficar was not necessarily opposed to a cost-reimbursable contract-in theory", see ESOC, para. 573.

- Citigroup, Reficar's lender, who commented on how an RC approach was more usual for similar megaprojects[777]; and

- a study by Nexidea, an external consultant, stating that Reficar could expect 9% in Project cost savings if it switched to an RC contract[778].

697. Furthermore, CB&I provided to Reficar the iChemE Green Book for Reimbursable Contracts, an objectively reliable source of information on the risk assumption under RC contracts in general[779], which would later be used to draft the EPC term sheet[780]. CB&I tried to inform Reficar objectively about the risks and rewards in cost-reimbursable contracts. Had it wanted to conceal the risks connected to the contracting switch, it would have only spoken of the alleged advantages, without giving an exhaustive and objective source of information on the subject.

698. Furthermore, during the drafting process, Reficar was assisted by the international law firm Linklaters, who as specialized professionals must have made Reficar aware of the differences between an LSTK and an RC contract[781]. Having been assisted by a professional law firm, Reficar cannot claim ignorance of the different risks which both contracting modalities implied.

699. The fact that Reficar was a highly shophisticated party advised by qualified experts has a second consequence: Claimant contends that it was entitled to place legitimate trust in Respondents' representations, and that this decreased its duty to self-inform. This is not so: it is true that under Colombian law legitimate trust in the counterparty's representation may be a factor which reduces the duty to self-inform. But this principle is not aplicable to Reficar, a sophisticated party advised by multiple qualified experts. The principle only applies to the trust placed by unexperienced parties.

* * *

700. In sum, Reficar was sufficiently briefed on the advantages and risks of a switch from LSTK to RC contracting to make a fully informed decision. In reaching the decision to switch, Reficar was advised by various independent advisors; CB&I also provided it with objectively true information. Thus, Reficar could not have been deceived by CB&I and induced to enter into the RC EPC Contract.

C. Own budget

701. In the run-up to the signing of the LOI, Ecopetrol[782] and Reficar's[783] BofDs approved a total Project budget of USD 3.777 billion +/- 10%[784]. The total budget of USD 3.777 billion was broken down to account for EPC Costs at USD 2.789

[777] Ex. R-0505.
[778] Ex. R-1853_002, p. 7.
[779] Tr.: 1618:8-1619:12.
[780] Ex. R-0563, p. 2.
[781] See e.g., Ex. R-0567.
[782] Ex. R-1848, pp. 14, 17.
[783] Ex. R-3708, p. 10 in conjunction with Ex. R-1853_0054, p. 3.
[784] Ex. R-1853_0054, p. 3.

billion, escalation at USD 117 million, contingency at USD 167 million, owner costs at USD 367 million and sunk costs at USD 337 million[785].

702. It is unclear how Reficar's and Ecopetrol's BofDs set the estimated EPC costs in their budget, because the value of USD 2.789 billion is:

- USD 200 million lower than the last Estimate prepared by the contractor on September 24, 2009, with EPC costs at USD 2.989 billion[786];
- USD 110 million lower than the previous September 3, 2009 estimate revision, with EPC costs at USD 2.899 billion[787].
- USD 706 million lower than the July 2009 Estimate, with EPC costs at USD 3.495 billion[788]

703. The disparity in numbers seems to suggest that Reficar also relied on its own means of determining the appropriate Project budget.

704. After approving the internal budget, Reficar's goal was for the Project costs to remain within the limit, without regard to any estimates that CB&I would release afterwards. When Reficar received the February 2010 Estimate, it wrote to CB&I and asked for a reduction of USD 44 million, to align the value with Reficar's internal budget[789]:

> "We would appreciate your deeply review and adjust to your Cost Estimate (Revision 2) to ensure that your final figures are consistent with those agreed and approved by our Board of Directors as expected limits".

705. On April 26, 2010, Mr. Deidehban sent a clarification[790], but Reficar did not take it into account. Instead, the May 25, 2010 Reficar BofD which approved the EPC Contract[791], accepted a total budget for the Project[792] of USD 3.221 billion (comprising USD 3.106 billion plus USD 115 million for the spring 2010 BRNs):

> "Una vez discutido lo anterior, la Junta Directiva solicitó que se definiera el alcance y el monto de las órdenes de cambio requeridas a la mayor brevedad. Adicionalmente, autorizó de manera unánime al representante legal de la sociedad a suscribir los contratos de ingeniería, procura y construcción para el proyecto de ampliación y modernización de la refinería de Cartagena, con las compañías CB&I UK Limited y CBI Colombiana S.A. según corresponda, al igual que todos los documentos relacionados o que se deriven de dichos contratos, teniendo en cuenta como cifra máxima de negociación para el

[785] Ex. R-3708, p. 10 in conjunction with Ex. R-1853_0054, p. 3.
[786] Ex. R-3444, p. 3.
[787] Ex. C-0032, p. 52.
[788] Ex. R-0524, p. 231.
[789] Ex. C-0042, p. 2.
[790] Ex. C-0031.
[791] Ex. C-0044.
[792] Ex. R-0605, p. 12.

> referido presupuesto estimado del proyecto la suma de US$3.221 millones"[793] [Emphasis added].

706. *Pro memoria*: the February 2010 Estimate, adjusted for the spring 2010 BRNs, amounted to USD 3.265 billion.

707. The discrepancy of some USD 44 million is the same which CB&I had pointed out over a month prior. There is no information in the record explaining this divergence. Thus, it appears that Reficar disregarded CB&I's explanation, as well as the February 2010 Estimate number, and used its internal numbers to approve the EPC Agreement.

708. The Tribunal is convinced that the Project costs were important for Reficar's decision to enter into the RC EPC Contract. However, there is no evidence from Reficar's BofD Meeting which would prove that the basis for their decision was solely the February 2010 Estimate.

D. PFs were imposed by Reficar

709. *Pro memoria*, the Tribunal has already established that the PFs used in the July 2009 Estimate (1.86 for greenfield work, and between 2.14 and 2.79 for brownfield) was already an optimistic prediction. The February 2010 Estimate reduced the greenfield PF to 1.66. The result was that the productivity of craft in Cartagena was undervalued by a factor of two.

710. The Tribunal has also found that there is clear evidence that the decision to reduce the PFs from 1.86 to 1.66 originated from Reficar, and was resisted by CB&I – see section VII.1.3.1.1 *supra*. The key piece of evidence is the February 2010 Estimate itself, which explicitly acknowledges in a chart that the PFs used are "client directed"[794]. Another important element is CB&I's letter dated May 5, 2010 (*i.e.*, before execution of the EPC Contract) stressing that the reduction of the PFs resulted from cost-savings exercises performed by Reficar and were based on the most optimistic outcome and rates experienced by Ecopetrol. The Contractor added that the undervalued PFs was one of the largest risk areas in the Project[795].

711. Being aware of CB&I's position, and with full knowledge that the PFs in the February 2010 Estimate were optimistic and represented a risk for the successful completion of the Project, Reficar still decided to execute the EPC Contract. Reficar could not and was not deceived by the undervalued PFs used in the Estimates.

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[793] Ex. C-0044, p. 4; translation into English at p. 12:
"Once the foregoing had been discussed, the Board of Directors requested that the scope and amount of the change orders be defined as soon as possible. In addition, it unanimously authorized the Company's legal representative to sign the engineering, procurement and construction contracts for the Cartagena Refinery expansion and modernization project with the companies CB&I UK Limited and CBI Colombiana S.A. as appropriate, together with all documents related to or arising from said contracts, taking as a maximum negotiating figure for the said estimated budget of the project the sum of USD 3.221 m" [Emphasis added].
[794] Ex. C-0041, p. 22.
[795] Ex. C-0315, p. 5.

E. Continuous participation and own review

712. Reficar was not a passive Owner who simply orders a refinery expansion and modernization project. On the contrary, Reficar actively participated in CB&I's cost estimating process, employed its own means to establish its own budget, and pressed CB&I to reduce its Estimates so that they would adhere with Reficar's internal cost predictions.

713. The transparency of CB&I's estimating process was acknowledged by Reficar's Chief Financial Officer in a letter sent to two Reficar estimators shortly before the issuance of the July 2009 Estimate[796]:

From: Fred Bendle
Sent: Wednesday, July 01, 2009 3:15 PM
To: Daniel Morgan; jim.bellow@reficar.com.co
Subject: report

Gentlemen

According to the Estimate plan the estimate should now be in the stage of "management review"
I assume therefore that it is complete - at least as a draft

As it has been a transparent process - are you aware of the amount of the estimate?
even if that is an amount subject to deciding on final "allowances" etc??

You will remember that your principle objective has always been to be able to form an opinion by 31 July, when the estimate is presented, on whether the estimate is correct, or too high, or too low? Or more probably - in which areas it is high, and in which it is low.

We have discussed several times that your opinion needs to be supported by evidence of the work you have carried out and a final Report, with back up documents.
Dan and I spoke at length about the approach that I favour. It was

714. These estimators had been hired as early as January 2009[797] as Reficar employees and their primary mission was to review the July 2009 Estimate; to comply with this task they had been placed full-time at CB&I's Houston office[798]. Through them Reficar was fully informed of the development of and progress in CBI's estimating process.

715. Shortly after the July 2009 Estimate was issued, on August 13, 2009 Reficar announced to CB&I that three further Reficar employees would be joining CB&I's Houston office to participate in the cost reduction efforts[799]. The record also shows that two other Reficar/Foster Wheeler estimators were still placed at CB&I's Houston office as of June 2010[800].

716. In addition to having its own estimating team, embedded in CB&I's Houston office, Reficar employed additional means to assess the reasonable costs for the Project:

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[796] Ex. R-3038, p. 1; Emphasis added. These were Daniel Morgan and Jim Bellow.
[797] B&OB Rebuttal ER, para. 180.
[798] Tr. 1659:20-1660:3.
[799] Ex. R-0543; these were Hugo Barrios, Medardo Chinchilla and Ezequiel Acosta.
[800] Ex. R-0532, rows 131 and 151. These were Ana Paula Gayon and Yobelis Rossi.

- CB&I gave Reficar access to iDocs, the in-house platform where all the inputs, backup, calculations and documents related to the estimate development were stored[801];

- Additionally, Reficar had CB&I's cost estimates audited by external advisors: in September 2008, Pathfinder reported on CB&I's early cost estimates[802]; shortly thereafter, in November 2008, the same consultant provided a comprehensive memorandum on CB&I's November 2008 estimate[803]; further insight on the same estimate, together with some alternative calculations, was provided by IPA in March 2009[804];

- Foster Wheeler developed and delivered its own, independent estimate of total Project costs (which was reasonably close to CBI's July 2009 Estimate)[805];

- Reficar also performed, together with Foster Wheeler, a contemporaneous review of the February 2010 Estimate[806].

717. Reficar avers that it and Foster Wheeler only conducted a high-level review of CB&I's deliverables and did not verify their falsehoods[807].

718. The record, however, proves that Reficar conducted a careful review of the work prepared by CB&I and was capable of raising detailed remarks and requests for additional data; Reficar's letter of March 19, 2010 did so with regard to the February 2010 Estimate[808]. A detailed review of CB&I's estimating work was also provided by Pathfinder in a report from late 2008 and by Foster Wheeler in the control calculations for the July 2009 Estimate.

719. Finally, Reficar's own witnesses agree that the work on the Estimates was approached jointly; for example, Mr. Chinchilla states that[809]:

> "Later, CB&I's Estimates Manager, Kris Gachassin, sent us a photo of the work that we did during the Savings Cost Workshop, which showed a table that we prepared together and that documented how the decisions made at the meeting had been reviewed and discussed collaboratively and in the presence of all participants, from both CB&I and Reficar, including me" [Emphasis added].

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720. In sum, it seems unlikely that Reficar could have been deceived or misinformed by CB&I regarding the July 2009 or February 2010 Estimates, as Reficar extensively

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[801] Ex. C-1036; Tr. 2706:9-13 (Mr. Deidehban); Tr. 1533:23-1535:6 (Mr. Houtz conceding that Reficar was provided unfettered access to the underlying documents of the estimate).
[802] Ex. R-0494, pp. 8-10.
[803] Ex. R-0029.
[804] Ex. R-2994, pp. 16-40.
[805] Ex. B-042, p. 29.
[806] ESOC, paras. 58-59.
[807] ESOC, para. 58.
[808] Ex. R-0032, p. 1.
[809] Chinchilla CWS, para. 18.

and transparently participated in their preparation, and engaged outside advisors to verify CB&I's calculations.

F. Scope changes: design continued

721. After CB&I had delivered the July 2009 Estimate, at the request of Reficar the Project suffered significant changes, to reduce costs and to increase synergies. The February 2010 Estimate incorporates the changes identified in the CRWs and the Synergy Changes using ROM values.

722. After delivery of the February 2010 Estimate but before execution of the EPC Agreement, in its letter of April 26, 2010 CB&I informed Reficar that the ROM estimates included in the 2010 Estimate were substantial: they reached USD 671 million, composed of

- USD 501 million cost reductions plus
- USD 170 million from Synergy Changes.

723. Having received this information, Reficar decided to execute the EPC Contract, in full knowledge that the Final Full Estimate contained USD 671 million in ROM figures, caused by late changes included at its request to reduce costs and increase synergies. Reficar cannot shift to CB&I the responsibility for these inaccuracies in the Final Full Estimate – the last-minute scope changes were requested by Reficar and CB&I transparently disclosed the affected amounts.

* * *

724. In light of the above, the Tribunal finds that Reficar, when it decided to enter into the EPC Contract, was aware of the shortcomings of the February 2010 Estimate, and cannot claim to have been deceived or misinformed by CB&I due to these shortcomings.

G. Limited relevance of the Final Full Estimate

725. The EPC Agreements do not refer either to the July 2009 Estimate nor to the February 2010 Estimate. The Agreements use a different terminology, that of Final Full Estimate, defined as

> "the estimate which is set out in Appendix IV to Section III, which amends the detailed Class 2 cost estimate (on a +/- 10% basis) which was delivered by the Contractor and Technip to the Owner on 31 July 2009 [*i.e.*, the July 2009 Estimate]"[810].

726. The Tribunal has already established (in section VII.1.1.7.C. *supra*) that the Final Full Estimate coincides with the February 2010 Estimate, modified by the spring 2009 BRNs submitted by CB&I. This means that the Final Full Estimate was set at

[810] JX-002, p. 165; JX-004, p. 151.

a value of USD 3.150 billion[811] + USD 115 million[812], *i.e.*, a total of USD 3.265 billion.

727. What was the contractual relevance of the Final Full Estimate?

728. The November 2009 LOI between CB&I and Reficar had provided for a "Control Budget" that would be attached to the final EPC Contract and which could only be modified through change orders[813]. This Control Budget played a role similar to the Bonus Target Cost in the EPC Contract, as it constituted the benchmark for CB&I's performance that could allow it to earn bonus compensation[814].

729. As the EPC Contract signing date in June 2010 was approaching, the importance to Reficar of the Final Full Estimate waned. Reficar must have become aware that the late design changes it was requesting, which were still not finalized, provoked an unintended consequence: that the February 2010 Estimate, even adjusted for the BRNs, failed to be a fully reliable prediction for the entirety of Project costs. This in turn made the Final Full Estimate (the sum of the February 2010 Estimate plus the BRNs), which was defined in and attached to the EPC Agreements, lose relevance:

- The Offshore Agreement does not make any further use of the definition of Final Full Estimate; while

- The Onshore Agreement only refers to the Final Full Estimate in TC 44.1.1, which provides that if the labour rates or the productivity factors used in the Final Full Estimate are changed, the Contractor is entitled to additional compensation[815].

730. The limited relevance of the Final Full Estimate is reinforced by the absence of any representation by CB&I with regard to its accuracy or development; CB&I also does not assume in the Contract any obligation or undertaking in relation thereto.

731. The irrelevance of the Final Full Estimate for the Contract goes even further: one provision that might have referred to it was CB&I's Bonus Target Cost; tellingly, the Contract does not use the figure of the Final Full Estimate (USD 3.265 billion[816]), and instead provides an alternative value of USD 3.221 billion, which derives from the budget approved by Reficar's BofD[817]. In simple words, to establish the Bonus Target Cost for CB&I, Reficar decided to use its own budget, as approved by its BofD, and not the figure established in CB&I's Final Full Estimate. This proves that despite all of Reficar's present arguments, at the relevant time it placed limited reliance on the Final Full Estimate.

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[811] Ex. C-0041, p. 50.
[812] Ex. C-0043.
[813] Ex. C-0037, pp. 9.
[814] Ex. C-0037, pp. 9-13.
[815] JX-002, pp. 215-216.
[816] USD 3150 million + USD 115 million = USD 3265 million.
[817] JX-002, TC 1.1, Definitions, p. 160; JX-004, TC 1.1, Definitions, p. 146.

732. The restricted importance of the Final Full Estimate was conceded by Reficar's own President, Dr. Cabrales, who stated in a letter from September 2011 that the Final Full Estimate was

> "merely a reference document. It was used at the outset of the Project primarily to determine bonus threshold and the likely full estimate value of the EPC"[818].

733. This finding is determinative, as Reficar's case of *dolo incidental* is built around the notion that the falsehoods in the Final Full Estimate induced it to enter into the RC EPC Agreement – a premise disproven by the evidence.

H. No reliance on the April 2010 Schedule

734. CB&I submitted the so-called April 2010 Schedule[819] approximately a month before the execution of the EPC Contract. There is no evidence that Reficar voiced dissatisfaction with the document it had received. The April 2010 Schedule showed February 28, 2013 as the Mechanical Completion Date[820] – an arrangement with which Reficar agreed.

735. The Mechanical Completion Date became a defined term in the EPC Contract, with meaningful consequences for CB&I in form of penalties in case it failed to meet the deadline[821]. The EPC Contract did not, however, attach a schedule. Instead, the Parties had agreed that CB&I would provide a Level 3 resource-loaded schedule within 90 days of Contract award[822].

736. While a Level 3 resource-loaded schedule may indeed have been important to Reficar in the initial stages of the Project, its outlook changed in the face of the approaching date of EPC Contract execution. Reficar accepted the April 2010 Schedule with a Mechanical Completion Date that adhered to its expectations and agreed to postpone a detailed and complete Level 3 schedule until after EPC Contract execution.

737. That Reficar's BofD only relied on the Mechanical Completion Date and not the April 2010 Schedule is corroborated by the BofD's discussion when it authorized the EPC Agreement. The presentation under the part of "schedule" first refers to the Mechanical Completion Date, then to the Early Completion Date, which served as the basis for potential bonuses for CB&I, and finally mentions that CB&I had delivered an updated level 3 schedule. The Mechanical Completion Date and the Early Completion Date are both in bold, while the Level 3 schedule is not even specified as being resource-loaded, proving that this was not a key component for the decision of Reficar's BofD[823]:

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[818] Ex. C-0432, p. 2.
[819] Ex. C-0052.
[820] Ex. C-0057, p. 12.
[821] TC 54.8, JX-002, p. 226; JX-004, p. 203.
[822] Project Controls Execution Plan for Engineering, Procurement and Construction, Annex 6, Section 6.5.3; JX-002, pp. 469-471; JX-004, pp. 444-446.
[823] Ex. R-0605, p. 12; translation from p. 87:
"Schedule: It was agreed that the date for Mechanical completion would be **February 28, 2013** and the Early Completion Date remains **November 30, 2012**. CB&I delivered the updated Level 3 last May 17."

> •Schedule: Se acordó fecha de terminación Mecánica **febrero 28 de 2013** y el Early Completion Date se mantiene en **noviembre 30 de 2012**. CB&I entregó el pasado 17 de mayo el nivel 3 actualizado.

738. There is no evidence that Reficar was deceived by the April 2010 Schedule, which reflected an agreed upon Mechanical Completion Date. The April 2010 Schedule did not fulfil all of the Level 3 and resource-loading criteria, but Reficar clearly did not base its decision to enter into the EPC Agreement on the basis of this deliverable, and accepted an undertaking by CB&I that the final Schedule would be delivered within 90 days of Contract execution.

* * *

739. In summary, the Tribunal has found no evidence that CB&I provided Reficar misinformation with the purpose of deceiving it into entering the RC EPC Contract:

- It was Reficar who, concerned about the volatile market conditions, took the initiative to change the EPC Contract from LSTK to RC;
- Reficar was aware that the February 2010 provided by CB&I was not an AACE Class 2 +/-10% estimate; similarly, it knew that the April 2010 Schedule was not a proper Level 3 resource-loaded schedule;
- Reficar did not rely on the Final Full Estimate when it consented to the RC EPC Contract, but on its own budget; similarly, it did not rely on the April 2010 Schedule, but chose to set a Mechanical Completion Date and obtain the Level 3 resource-loaded schedule after the execution of the contract.

740. The Tribunal has also found that Reficar took an informed decision to change to an RC EPC Contract, based on the information and advice obtained from various sources; and that CB&I's input was not accepted *per se*, but was subjected to a careful review by expert advisors engaged by Reficar.

2.3. LACK OF CAUSALITY

741. Reficar argues that, had it not been for the CB&I's deceit regarding cost and schedule, it would not have agreed on an RC EPC Contract, or at least not on the liability caps. Even if it is accepted, *arguendo*, that Reficar had been deceived by CB&I's conduct, *dolo incidental* requires that the aggrieved party prove the alternative scenario which would have occurred, absent the deceit. In this case, Reficar has failed to meet this test:

742. First, in the normal *dolo incidental* situation, the aggrieved party is tricked to pay an excessive price – and the alternative scenario is that, absent the deceit, it would have paid a lower price (and the price difference equates with the damage).

743. In the present case, Reficar alleges that it was tricked to enter into an RC Contract, instead of an LSTK Contract; the alternative scenario is, thus, a modality of Contract which would have attracted a very substantial remuneration premium of between 10% and 40%, due to the then present volatile market conditions. But, as CB&I correctly pointed out, Reficar is not claiming damages for the cost difference between the LSTK and the RC pricing modalities, but rather reimbursement of

unreasonably and improperly incurred costs (and loss of profit) under the RC EPC Contract it actually signed. There is thus an inconsistency between the delinquency which Reficar is imputing against CB&I (*dolo incidental*) and the remedy sought in this procedure (cost reimbursement and lost profits).

744. Reficar says that it has paid an excessive price for the Project; but the price increase has not been caused by CB&I's pre-contractual conduct, but allegedly by CB&I's post-contractual behaviour: the Constructor has charged a price much higher than anticipated (whether in compliance or in breach of the EPC Contract is a question which will be addressed in the next section). There is, thus, no causal link between CB&I's alleged *dolo incidental* and the damage which Claimant says it has suffered.

745. Second, the Tribunal is also not convinced that, absent the deceit, Reficar would have rejected that CB&I's overall liability under the EPC contract be capped to a certain amount. Liability caps are a common provision, in all kinds of construction contracts (including RC and LSTK contracts); in fact, the Project Definition Contract[824], the LOI[825] as well as the initial versions discussed during the negotiations of the final text of the EPC Agreement[826] contained provisions limiting the Contractor's liability.

746. Reficar has not proven that the liability cap was specifically incorporated into the contract because of its RC nature or that it would have rejected the inclusion of a liability cap had it been properly informed of the risks of RC contracting. In any event, Reficar's argument fails because it was advised by a professional law firm, Linklaters[827].

* * *

747. In sum, the Tribunal finds that Reficar has failed to provide a convincing counter-factual scenario for its *dolo incidental* claim, that would allow the Tribunal to establish the consequences of CB&I having deceived Reficar into entering into the RC EPC Contract and that would allow for a proper calculation of potential damages.

2.4. NO LESS BENEFICIAL CONTRACTUAL TERMS

748. The Tribunal has already determined that Reficar was well advised on the risks associated with an RC EPC Contract vs an LSTK EPC Contract. The two principal risks relate to cost overruns and conflict of interest:

[824] See Ex. C-006, Section 26 "Limitations of Liability" at pp. 42-44.
[825] Ex. C-0037, p. 5: "Aggregate Liability – The Aggregate cap on liability is $USD 70MM [...]".
[826] See *e.g.*, Ex. R-0568, p. 5 "Reficar's Position (25/01/10)" at item 7 "Remedies" states: "No waiver of remedies established in Colombian law, subject to the liability caps. To the extent that resolution (rescission) or specific performance is required, this will only be up to the limits of liability set out in the EPC"; Ex. R-0569, "TC8 - Limitations of Liability 8.1 Limitation of Contractor's Liability" and similar wording under Ex. R-0570 at pdf p. 37.
[827] See e.g., Ex. R-0567.

- If an RC project incurs cost overruns, these have to be assumed by the Owner in their entirety, and

- The Constructor, who is being kept fully indemnified by the Owner, has little interest in minimizing and controlling costs.

749. Reficar, well advised by its experienced legal counsel, understood these risks and in the EPC Agreement included two provisions which shielded it from those pitfalls:

750. First, Section IV on Pricing of the Onshore[828] and Offshore[829] Agreements includes Appendix I (on Contractor's Fixed Fee, Rates and Management Fee) which reads as follows:

> "In consideration of the performance by the Contractor of the Work under this Agreement, the Owner will pay the Contractor on a cost reimbursable basis [...] and the amount payable shall be the Contract Price. Only costs which are reasonably and properly incurred by the Contractor in accordance with the Agreement in carrying out the Work shall be paid by the Owner" [Emphasis added].

751. This provision creates a triple condition, to give rise to Reficar's obligation to reimburse a cost incurred by CB&I. Reimbursable costs must:

- Be reasonable,

- Have been properly incurred in accordance with the Contract, and

- Have been incurred in carrying out the Project.

752. Second, para. 3 of the Project Execution Plan, which, as Annex 13, forms an integral part of the Contracts, reads as follows[830]:

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own". [Emphasis added]

753. Under this provision CB&I accepted a double undertaking:

- To rigorously control cost and schedule, applying the same standards as in an LSTK agreement, and

- To safeguard Reficar's resources as if their own.

754. These two provisions have been referred to jointly as the "**Cost Control Commitments**". These contractual safeguards protected Reficar from unreasonable costs and delay and from CB&I's improper conduct due to conflict of interest.

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[828] JX-003, p. 3.
[829] JX-005, p. 3.
[830] JX-002, p. 654; JX-004, p. 628.

Reficar willingly accepted the RC structure, knowing that these protections were in place.

755. Thus, the second prong of the *dolo incidental* claim is also not met: Reficar has not proven that by agreeing to the RC EPC Contract it accepted contractual terms that were less beneficial than those which it would have agreed to in an LSTK EPC Contract.

2.5. CONCLUSION

756. In sum, the Tribunal finds that there is no evidence that CB&I acted with *dolo incidental* in the pre-contract stage. CB&I did not deceive Reficar into signing the RC EPC Agreement:

- Because Reficar was fully and independently informed of the risks and benefits of such contractual arrangements,

- Because it had knowledge of deficiencies in CB&I's pre-contract deliverables, some of which were caused chiefly by its own late decision to introduce changes to the Project, and

- Because it did not fully and exclusively rely on these deliverables in its decision to enter into the EPC Agreement.

757. Reficar has also failed to establish a convincing counter-factual scenario, a crucial element of a *dolo incidental* claim.

758. That said, CB&I's conduct is not without blame.

759. The February 2010 Estimate did not meet the Class 2 +/-10% requirement, notwithstanding the indication on its cover page. CB&I should have eliminated the reference to Class 2 +/-10% from the cover page, and Mr. Deidehban's letter, answering a direct question from Reficar, could and should have been less ambiguous.

760. But later on, CB&I did inform Reficar that the design changes that it had requested resulted in the inclusion of ROM figures which amounted to USD 671 million (USD 501 million cost reductions identified in the CRWs and USD 170 million resulting from Synergy Changes). Reficar, who carefully reviewed the Estimate with its own team of estimators and with the support of its external advisors, must have been aware that ROM values in these amounts implied that the Estimate could not meet the Class 2 +/-10% threshold.

761. Hence, CB&I's conduct did not amount to deceit and was incapable of resulting in *dolo incidental*.

3. NO BREACH OF DUTY TO ACT IN GOOD FAITH

762. As a second argument, Reficar argues that CB&I violated its good faith duties in the negotiation of the EPC Contract, by failing to provide Reficar full and correct information and by other specific conduct[831]. CB&I denies the claim[832].

3.1. APPLICABLE LAW

763. The duty to inform during negotiations under Colombian law derives from a more general obligation of good faith. Provisions regulating this duty may be found in general under Art. 83 of the Colombian Constitution[833] and in the more detailed context of the pre-contractual period, under Art. 863 of the Colombian Commercial Code[834]:

> "*Artículo 863. BUENA FE EN EL PERIODO PRECONTRACTUAL.*
>
> *Las partes deberán proceder de buena fue exenta de culpa en el período precontractual, so pena de indemnizar los perjuicios que se causen*"[835].

764. This general requirement of acting in good faith gives rise to more detailed secondary duties; both experts on Colombian law agree that such duties include

- the duty to inform,
- the duty of loyalty and
- the duty of care,

which apply during the pre-contractual stage and during the performance of the contract even if not specifically spelled out therein[836].

765. Reficar's precontract claim focuses on one of these secondary good faith obligations: the duty to fully inform the counterparty during negotiations.

766. Reficar argues[837] and CB&I does not contest[838] that:

- the information provided must be clear (understandable), transparent (complete and precise) and timely (in advance allowing for informed decision)[839]; information does not meet the required standard if it is misleading, relative, out of date, obscure or deliberately insufficient[840];
- the information must be relevant;

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[831] CPHB, para. 60 and references therein.
[832] RPHB, paras. 70-71; ESOD, paras. 1424-1426.
[833] CL-001.
[834] CL-020.
[835] Translation taken from RL-404:
"Art. 863.- The parties shall proceed in good faith exempt from guilt during the pre-contractual period, under penalty to compensate the damage caused".
[836] Solarte I, paras. 193-200; Arrubla I, paras. 86-91.
[837] CPHB, para. 46; Reply, para. 59.
[838] RPHB, para. 70.
[839] CPHB, para. 46, citing to Solarte II, para. 166.
[840] CPHB, para. 46.

- the information should be in possession (or should have been in possession of) of the revealing party; and

- the information should not already be in possession of the receiving party.

767. Summing up, Art. 863 of the Colombian Commercial Code regulates the period of negotiations leading to the execution of a contract; the rule requires that, during this period both parties must act in good faith, and such obligation includes the duty to provide to the counter-party

- clear and transparent information,

- which is relevant for the contract execution, and

- to which the counter-party does not have access.

If a party fails to comply with this standard of disclosure or in some other way acts in bad faith during the negotiations, the validity of the executed contract is not impaired, but the aggrieved counter-party is entitled to be compensated for the damage suffered.

3.2. DISCUSSION

768. CB&I delivered numerous pieces of information to Reficar during their pre-contract negotiations, including several estimates, schedules and aclaratory letters. The Tribunal has already established that Reficar was not deceived by this information and that CB&I did not act with *dolo incidental* when it provided the deliverables. The discussion now centers on a different issue: Colombian law requires that during contract negotiations both parties must, under their general act in good faith duty, provide to the other party relevant information to which the counter-party does not have access; such information must be clear, complete and precise.

769. The duty to act in good faith and provide information is not absolute and depends on the specific characteristics of each of the parties.

770. In this case, CB&I is an international construction firm, with extensive professional experience in the construction of refineries. CB&I had superior knowledge of the refinery-construction business and was placed in a better position to know whether the Estimates and Schedule were accurate[841]. This would militate for a heightened or reinforced duty of candour.

771. But this conclusion must be weighed against the fact that Reficar is a highly experienced operator of refineries, with an extensive and qualified team of in-house engineers and analysts, capable of developing sophisticated cost saving and synergy improving alternatives. The record also shows that Reficar had its own group of estimators, who were physically inserted in CB&I's Houston offices to help in the estimating effort and verify CB&I's work. Finally, Reficar was supported by a cadre of outside experts, engineers, consultants, and lawyers.

[841] ESOC, paras. 2, 544, 762.

772. The Tribunal will address certain instances in which Reficar alleges that CB&I acted with bad faith in the pre-contractual stage. The Tribunal will refer to:

- CB&I's change in its business strategy (**A.**),
- the alleged threats by CB&I (**B.**),
- CB&I's announcement in February 2010 that it had been awarded the Contract (**C.**),
- the introduction of TC 44.1.1 into the EPC Contract (**D.**),
- the Class 2 +/-10% requirement of the February 2010 Estimate (**E.**), and
- finally, the allegedly deficient Schedule (**F.**).

A. Change in CB&I's business strategy

773. Reficar argues that CB&I took a general business decision to change its strategy and to "de-risk" its construction portfolio, by phasing out LSTK contracts and moving to RC contracts[842]. According to Reficar, this internal change was not communicated to Reficar and constituted a breach of good faith[843].

774. The Tribunal disagrees with Reficar.

775. First, it appears that CB&I did let Reficar know about this change in strategy – Mr. Houtz, a Reficar employee, reports that CB&I's Mr. Sipes informed him of this fact on a flight in the spring of 2008[844].

776. Second, CB&I was a listed company, and had a duty to inform the financial markets of any relevant change in its business strategies. On July 15, 2008 CB&I publicly announced its new strategy in an investor call[845]:

> "As we have discussed on numerous occasions, we are de-risking our portfolio by modifying our fixed price business model. During the past year, we have reduced CB&I's risk profile from 90%+ higher-risk projects to around 55%. […] We are also targeting a portfolio mix of no more than 20 to 25% risk in work by the end of 2009".

777. There is no evidence that CB&I in bad faith tried to hide this information from Reficar.

B. Alleged threats by CB&I

778. Reficar brings another instance of alleged bad faith by CB&I to the Tribunal's attention:

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[842] CPHB, paras. 63-64.
[843] CPHB, paras. 71-72.
[844] Houtz CWS, paras. 87-88.
[845] Ex. C-0011, p. 4.

779. According to Reficar, in October 2009, Mr. Deidehban threatened Reficar with "drastic" changes, if Reficar continued to request an LSTK estimate, and the threat further induced Reficar to agree to the change in the contracting modality[846].

780. Mr. Deidehban's conduct does not breach the duty of good faith: CB&I had been working under the impression that the decision to switch to RC had been made as early as June 2008[847] and preparing a new LSTK estimate would have required considerable additional resources, which were not budgeted for – according to CB&I, by that point, the FEED budget had been exhausted[848]. Therefore, the "drastic" changes mentioned by Mr. Deidehban were not exaggerated and would actually have been needed, if Reficar had insisted on CB&I preparing a new LSTK estimate – which it did not.

C. Contract award announcement

781. Reficar also argues that CB&I prematurely announced in an investor earnings call from February 2010 that it had been awarded the EPC Contract in November 2009, half a year prior to the actual signing of the EPC Contract – according to Reficar, this proved a source of motivation for CB&I to be awarded the EPC Contract no matter what, even if it meant deceiving Reficar[849].

782. The Tribunal disagrees with Reficar. The investor call announcement referred to the November 2009 LOI, the preliminary agreement signed between Reficar and CB&I and labelled it as a contract. This was partially justified because the LOI's full name is actually "Letter of Intent and Authorization to Proceed with the EPC work […]"[850] [Emphasis added]. Since the LOI allowed CB&I to proceed with EPC work, it did permit CB&I to commence the EPC work, even though the LOI itself stated that it did not oblige the Parties to ultimately enter into the EPC Contract[851], as correctly indicated by Reficar[852].

783. That CB&I's officers were announcing the award of the LOI rather than the EPC Agreement is reinforced by the numbers given by CB&I's officials: USD 1.5 billion (stated by the CEO)[853] and USD 1.4 billion (as stated by the COO)[854], rather than the USD 3 billion contemplated for the Project[855].

* * *

784. Therefore, the Tribunal does not see any breach of good faith duties in CB&I's investor call announcements.

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[846] CPHB, para. 69, referring to Ex. C-0022, p. 1.
[847] Ex. R-2067, p. 2; Canals RWS, para. 78.
[848] ESOD, para. 144, referencing Exs. R-0017, R-0550 and R-0551.
[849] CPHB, paras. 117-119, citing to Ex. C-1924, pp. 3-4.
[850] Ex. C-0037, p. 1.
[851] Ex. C-0037, p. 3.
[852] CPHB, para. 118.
[853] Ex. C-1924, p.3; CEO stands for Chief Executive Officer.
[854] Ex. C-1924, p. 4; COO stands for Chief Operating Officer.
[855] The September 2009 Revisions to the July 2009 Estimate foresaw EPC Costs at USD 2.899 and USD 2.989 billion, respectively, and the February 2010 Estimate – at USD 3.150 billon.

D. Introduction of TC 44.1.1

785. According to Reficar, CB&I in bad faith[856] inserted a contract provision in the EPC Agreement, TC 44.1.1, which intended to shield CB&I from financial fallout of lower-than-expected productivity, of which CB&I was fully aware[857].

786. TC 44.1.1 reads as follows:

> "44.1.1 Skilled and Qualified Craftsmen
>
> [...]
>
> Should the actual productivity values be different than those set out in the Final Full Estimate, the Contractor shall be entitled to change in those productivity values with the Written Approval of the Owner".

787. The clause foresees the possibility that actual PFs are higher than those used in the Final Full Estimate, due to the craftsmen in Cartagena reaching a productivity lower than that expected. In such case, CB&I is entitled to change the PFs in its estimates, provided that it obtains the previous authorization of Reficar.

788. The Offshore Agreement, as it does not cover local construction work, does not contain an analogous provision.

789. Far from showing bad faith, TC 44.1.1 reinforces CB&I's argument that it repeatedly tried to warn Reficar that the PFs in the February 2010 Estimate and, consequently, in the Final Full Estimate were overly aggressive. The existence of the clause simply shows that CB&I foresaw the possibility that higher PFs would result necessary, and that, if this happened and Reficar agreed, the new PFs would be used in future estimates. Reficar agreed to this.

790. The Tribunal does not see any element of bad faith.

E. The Class 2 +/-10% requirement of the February 2010 Estimate

791. The Tribunal has already established that the July 2009 Estimate did not adhere to the AACE Class 2 +/-10% accuracy level, because the engineering deliverables were not at the level required by AACE[858]. But the more relevant deliverable for Reficar's decision to enter into the EPC Contract was not the July 2009 Estimate, but the February 2010 Estimate, which corresponded to the Final Full Estimate. The February 2010 Estimate also failed to meet the Class 2 +/-10% requirement, notwithstanding the indication on its cover page to the contrary, but for a different reason: Reficar's design changes had resulted in the inclusion of ROM figures which amounted to USD 671 million, composed of USD 501 million cost

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[856] CPHB, para. 90.
[857] CPHB, para. 89.
[858] The Tribunal need not enter into Reficar's fragmentary argumentation on the P80 character of the July 2009 Estimate raised at the Hearing at Tr. 5028:17-20 but not addressed in detail in Reficar's written submissions. Any putative finding would not change the Tribunal's decision on the accuracy of the Estimate.

reductions identified in the CRWs and USD 170 million resulting from Synergy Changes – making a Class 2 +/-10% category illusory.

792. The Tribunal has already established that CB&I's conduct with regard to the February 2010 Estimate was not without blame:

- CB&I should have eliminated the reference to Class 2 +/-10% from the cover page, and

- Mr. Deidehban's letter, answering a direct question from Reficar, could have been less ambiguous and should have candidly disclosed that the February 2010 Estimate was not Class 2 +/-10%[859].

793. But the Tribunal has already established that CB&I's conduct did not amount to deceit and was incapable of resulting in *dolo incidental,* because CB&I, before the execution of the EPC Contract, properly disclosed to Reficar that the design changes that it had requested had resulted in the inclusion of ROM figures (see Section VII.1.3.2.2.F *supra*).

794. The question which the Tribunal must now address is whether CB&I's conduct, although not reaching the level of irregularity necessary for *dolo incidental*, could still qualify as a breach of the general duty of good faith. Did the general principle of good faith require that CB&I candidly disclose to Reficar that the February 2010 Estimate, contrary to its cover page, did not meet the Class 2 +/-10% requirements?

795. The Tribunal, not without some hesitation, decides in CB&I's favour. In finding that CB&I did not breach its duty to inform derived from good faith, the Tribunal finds the following arguments compelling:

796. First, it is a general principle of Colombian civil law, that bad faith cannot be presumed and must be properly proven; the general presumption is that parties act in good faith. This principle is enshrined both in

- the CCC, under Art. 769:

  "***ARTÍCULO 769. PRESUNCIÓN DE BUENA FE.*** *La buena fe se presume, excepto en los casos en que la ley establece la presunción contraria.*

  En todos los otros, la mala fe deberá probarse" [860]

and

- the Commercial Code, under Art. 835:

  "***ARTÍCULO 835. PRESUNCIÓN DE BUENA FE***. *Se presumirá la buena fe, aún la exenta de culpa. Quien alegue la mala fe o la culpa de una persona,*

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[859] See Section VII.1.3.1.3.C.b. *supra*.
[860] RL-401; translation into English at p. 3:
"ARTICLE 769. PRESUMPTION OF GOOD FAITH. Good faith is presumed, except in cases whereby the law presumed otherwise.
In all other cases, bad faith must be proven".

> *o afirme que ésta conoció o debió conocer determinado hecho, deberá probarlo*"[861].

797. Thus, the burden of proof for alleged bad faith behavior by CB&I lies with Reficar. Reficar has failed to discharge the burden to prove its case.

798. Second, the Estimates' failure to meet the Class 2 +/-10% standard was not CB&I's fault. The fundamental reason for the 2010 February Estimate's deficiency was Reficar's very late decisions to introduce significant design changes which, due to time constraints, CB&I was only capable of inserting at ROM levels. To make matters worse, after initially giving a green light to redesign the Synergy Changes-affected units, a month later Reficar told CB&I to stop the re-design of these units[862]. It also appears from the case record that Reficar instructed CB&I not to proceed with re-doing basic design but instead to move straight to detailed engineering[863] – a procedure which required additional time.

799. Third, before the EPC Contract was executed CB&I made up for the inaccuracies in the title of the Estimates and properly informed Reficar that the February 2010 Estimate included USD 671 million in ROM figures[864]. Reficar, an experienced and well advised refinery operator, confronted with this information, could have taken the decision to postpone execution of the EPC Contract until CB&I had managed to convert the USD 671 million ROM figure into a Class 2 +/-10% amount. It chose not to do so, and instead it decided to accelerate the execution of the Contract, based on its own estimated budget, and trigger the commencement of the construction.

800. Finally, Mr. Deidehban's conduct, although not to be commended, did not amount to a falsehood – more to an opaque ambiguity.

801. Reficar had sent a letter dated 30 April, requesting 16 items of clarification[865]. In Item 12 Reficar voiced the doubt whether the February 2010 Estimate was indeed Class 2 +/-10%:

> "Based on the comments provided, we cannot confirm that this estimate meets the requirements of a +/-10% estimate" [866].

802. Mr. Deidehban gave a somewhat ambiguous answer, appearing to confirm the +/-10% certainty, but sharing responsibility over the accuracy with Reficar:

> "CB&I would like to kindly remind Reficar that the planning and review of the EPC Estimate was a joint process between Reficar and CB&I-TPIT Consortium. The review and implementation of the estimate plan,

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[861] RL-403; translation into English at p. 3:
"ARTICLE 835. PRESUMPTION OF GOOD FAITH. Good faith is presumed, even that exempt from guilt. He who alleges bad faith or blames a person, or affirms that they knew about or should have known a certain fact must prove so".
[862] Ex. R-0552, p. 1; Tr. 1586:10-15.
[863] Ex. B-052, p. 2; the speaker was Mr. Deidehban.
[864] See Section VII.1.3.2.2.F. *supra*.
[865] Ex. C-0314.
[866] Ex. C-0314, p. 3.

> procurement plan and many other key factors that supported the +/-10% estimate were approached by all Parties as a team"[867] [Emphasis added].

803. Reficar could have asked for a clarification – there is no evidence in the record that it did, and thus the ambiguity was not properly cleared.

* * *

804. All in all, the Tribunal finds that, although CB&I's, and especially Mr. Deidehban's conduct are not without blame, the standard under Colombian law for a finding of bad faith is high, and that CB&I's conduct did not trespass the level of propriety which would provoke a breach of the good faith duties of Art. 863 of the Colombian Commercial Code.

F. Deficient Schedule

805. Reficar claims that CB&I also acted in bad faith regarding the April 2010 Schedule, by not disclosing that it was in fact a Level 2 Schedule and that the resource-loading was done at an insufficient level[868].

806. It is true that the April 2010 Schedule did not fulfil all of the Level 3 and resource-loading criteria. But the Tribunal has already established that there was no deceit, because Reficar accepted CB&I's offer, and the EPC Contract provided that the final Schedule be delivered within 90 days of execution, provided that the Mechanical Completion date remained the same.

807. The existence of an agreement between CB&I and Reficar with regard to the delivery of the final Schedule with a delay of 90 days, and CB&I's subsequent compliance with the terms of the agreement, also excludes any possibility of considering CB&I's conduct as bad faith.

808. As a result, the Tribunal finds that there is no evidence that CB&I breached its good faith duties as regards the April 2010 Schedule.

3.3. CONCLUSION

809. Art. 863 of the Colombian Commercial Code requires that during the period of negotiations both parties must act in good faith, and provide to the counter-party

- clear and transparent information,
- which is relevant for the contract execution, and
- to which the counter-party does not have access.

If a party fails to comply with this standard of disclosure or in some other way acts in bad faith during the negotiations, the aggrieved counter-party is entitled to be compensated for the damage suffered.

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[867] Ex. R-0027, p. 4.
[868] CPHB, paras. 114-115.

810. Reficar alleges that CB&I acted with bad faith in the pre-contractual stage when it decided to change its business strategy, when it threatened drastic changes if Reficar required another LSTK estimate, when it prematurely announced the awarding of the EPC Contract, when it insisted in introducing TC 44.1.1 into the EPC Contract, when it failed to candidly disclose that the February 2010 Estimate was Class 2 +/-10% and finally when it submitted a deficient Schedule.

811. The Tribunal has analysed these situations and has found for CB&I: Reficar has been unable to prove CB&I's pre-contractual misconduct. In one instance, the Tribunal has come to this conclusion not without hesitations: CB&I has failed to candidly disclose to Reficar that the February 2010 Estimate in fact did not meet the Class 2 +/-10%. CB&I's, and specially Mr. Deidehban's conduct in this respect are not to be commended, but, in the Tribunal's considered opinion, such conduct is not the expression of bad faith and does not give rise to a breach of the good faith duties of Art. 863 of the Colombian Commercial Code.

4. IRRELEVANCE OF THE DOCTRINA DE LA RESPONSABILIDAD EN LA CONFIGURACIÓN DEL CONTRATO

812. Reficar has also invoked the *doctrina de la responsabilidad en la configuración del contrato*, which Reficar defines as follows[869]:

> "When a breach of the duty to inform causes the other party to agree to certain terms of a contract to which that party otherwise would not have agreed, those terms will not be enforced against the aggrieved party".

813. Reficar's legal expert, Judge Solarte, does not refer to a *doctrina de la responsabilidad en la configuración del contrato*, but simply to a "*daño en la configuración del contrato*", which he describes with these words[870]:

> "*[E]l daño en la configuración del contrato se presenta cuando el deber de información ha sido vulnerado por una de las partes durante la etapa de negociación del contrato, y esta conducta ocasiona que la otra parte manifieste su consentimiento respecto de condiciones contractuales que no hubiera aceptado de haber sabido que la información no era veraz o completa*" [Emphasis added].

814. According to Judge Solarte, the *daño en la configuración del contrato* arises whenever there is a breach of the pre-contracual duty to inform, which leads the aggrieved party to agree on less beneficial terms then it would have, had it been properly informed. In support of his theory, Judge Solarte quotes a book by Prof. Rengifo, who also refers extensively to the "*daño en la configuración del contrato*", which derives, as he explains, when the counterparty has acted with *dolo incidental*[871].

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[869] CPHB, para. 128.
[870] Solarte ER II, para. 137.
[871] Mauricio Rengifo: "*La formación del contrato*", p. 290; CL 490; the daños can also occur in some other circumstances, which are irrelevant for this discussion.

815. In his opinion, Judge Solarte further explains how damages should be calculated in these situations:

> "*En los supuestos de daño en la configuración del contrato el monto de la reparación [...] corresponderá al valor que surja de realizar una comparación entre el contenido del contrato efectivamente celebrado y el que hubiera existido si la víctima hubiese tenido una información veraz y oportuna* […]"[872] [Emphasis added].

816. Judge Solarte's opinion could not be clearer: the doctrine of "*daños en la configuración del contrato*" leads to a remedy of damages, to be calculated by comparing an "as is" scenario (the contract as signed) and a "but for" scenario (the contract that would have been agreed had there been full information). His opinion echos the Tribunal's findings regarding the calculation of damages in situations where one party has acted with *dolo incidental* – see section 2 above.

817. Reficar's opinion is different: it submits that in the present case the doctrine would lead to the inapplicability of certain provisions in the EPC Agreement, such as the liability caps. Reficar argues that if there is *responsabilidad y daño en la configuración del contrato*, the disadvantageous terms of the contract may be deemed inapplicable, and the contract may be thus "reconfigured" by the Tribunal to recreate what it would have been, had the victim party been fully informed.

818. This is a clear misunderstanding of Judge Solarte's and Prof. Rengifo's opinions: both simply stated that if there is a breach of the duty to inform, or if one party acts with *dolo incidental* during the negotiations, leading the other party to accept terms and conditions which it otherwise would not have accepted, the aggrieved party is entitled to damages. But neither Judge Solarte nor Prof. Rengifo state what Reficar avers: that the remedy is the inapplicability of the terms and conditions which the aggrieved party, had it had full information, would not have accepted.

Case law

819. The few cases invoked by Claimant confirm the Tribunal's position; in these procedures, the adjudicators decided that, if a party had breached its duty to inform, the appropriate remedy was damages (as the Commercial Code and Civil Code provide), but not partial nullity of the offending terms and conditions:

820. Claimant's expert refers to an order given in 2012 by the Colombian *Consejo de Estado* (Council of State) in the *Endesa* case[873], in which the dispute focused on the selling party failing to disclose in the pre-contractual negotiations certain liabilities of the enterprise which was the object of the sale[874]. The Council of State found that[875]:

> "*[E]xistiendo el deber de informar sobre la existencia de ese pasivo y habiéndose omitido brindar la información respectiva, es claro que se*

[872] Solarte ER II para. 140.
[873] Solarte ER II, para. 139.
[874] CL-818.
[875] CL-818, p. 20.

> *incumplió con ese deber precontractual y por ende surge el deber de reparar el daño que se hubiere ocasionado con la reticencia*".

821. The Council of State found that there had been a breach of the obligation to inform, but the remedy enforced was not a change in the provisions of the contract – instead, the Council awarded damages as if it were a case of breach of the duty to inform or a *dolo incidental* case[876].

822. The other case referred to by Reficar in detail concerns the arbitration of *Concesionaria Vial de Los Andes S.A. v. Instituto Nacional de Vías*, in which the concessionaire agreed to assume the risk that work quantities exceeded 30% of the projected amounts, and where the pre-contractual studies contained significant errors.

823. The tribunal found that this risk provision would not have been agreed to by the claimant had it been fully and properly informed[877]:

> "*Así las cosas, el tribunal considera que no puede argumentarse que el concesionario estaba obligado a asumir el riesgo de diferencia en cantidades de obra por encima del 30%, pues esta propuesta se formuló sobre la base de una información errada, que, de haberse conocido, hubiera determinado que dicha propuesta no se realizara o por lo menos, hubiera sido planteada a sabiendas*".

824. However, the tribunal did not purport to apply the *configuración del contrato* doctrine (in fact, there is no reference whatsoever to this concept in the award). Neither did it order the inapplicability of certain provisions – the tribunal simply awarded damages[878].

825. Summing up, the Tribunal dismisses Reficar's argument that if there is *responsabilidad y daño en la configuración del contrato*, the disadvantageous terms of the contract may be deemed inapplicable, and the contract may be "reconfigured" by the tribunal to recreate what it would have been, had the victim been fully informed. Reficar's position is based on a misunderstanding of Judge Solarte's and Prof. Rengifo's opinions, and finds otherwise no support in Colombian case law.

[876] CL-818, p. 22.
[877] CL-375, p. 44.
[878] CL-375, pp. 144-145.

VII.2. CONTRACTUAL CLAIMS

826. Reficar's contractual claims are four-pronged: first, for improper EPC costs incurred in breach of the Contract provisions on controlling costs (**VII.2.1.**), second, for improper delay costs (**VII.2.3.**), third, for work completion costs (**VII.2.4.**) and finally, for procurement costs (**VII.2.5.**). CB&I denies these claims and brings a counterclaim, mostly for unpaid invoices (**VII.2.2.**).

827. Finally, both Parties also request the Tribunal declaratory relief related to the indemnification obligations under the EPC Contract (**VII.2.6.**).

VII.2.1. IMPROPER EPC COSTS

828. Claimant claims, in essence, that CB&I breached the Cost Control Commitments[879] and made Reficar incur unreasonable and improper costs. The existence of these unjustified cost overruns is allegedly confirmed by the sheer size of the difference between the real costs and the cost projections that CB&I provided to Reficar.

829. CB&I retorts by denying that cost overruns could have occurred at all, because of the cost-reimbursable nature of the Contract, because of the Reficar-accepted increases to the Project budget and finally because of Reficar's acceptance of costs through payment of invoices, after their extensive review. In addition, if *arguendo* there were any cost overruns, all of them would have arisen due to Reficar's, and not CB&I's, fault.

830. The Tribunal will first briefly describe the relevant facts (**1.**), then summarize the Parties' positions (**2.**) and finally enter into a discussion (**3.**).

1. FACTS

831. As discussed under Section VII.1.1.7 , the EPC Agreement was signed on June 15, 2010[880]. The EPC Contract is a cost-reimbursable agreement between the Parties pursuant to TC 58.1 "Contract Price". Section IV of the Contract specifies which costs were reimbursable[881] and para. 3 of the Project Execution Plan introduces CB&I's heightened standard of care in incurring costs[882].

832. While the EPC Agreement specifically states under TC 58.1 that it is of indeterminate value[883], it does set a Bonus Target Cost at USD 3.221 billon[884] – CB&I would obtain an extra remuneration if it were capable of keeping costs below this limit[885].

[879] See Section VII.1.1.7.D above.
[880] See e.g., JX-002, p. 13.
[881] JX-003, p. 3; JX-005, p. 3.
[882] JX-002, p. 654; JX-004, p. 628.
[883] JX-002, p. 235; JX-004, pp. 211-212.
[884] TC 1.1; JX-002, p. 160, JX-004, p. 146.
[885] See analysis at Section VII.1.1.7.B.c.

A. Monthly Forecasts and the Reficar Budgets

833. To control costs in real time, CB&I was contractually bound to provide to Reficar monthly cost forecasts [previously defined as the "**Monthly Forecasts**"], an estimate of the total EPC costs that Reficar would incur until the finalization of the Project, and of the necessary schedule[886].

834. The Monthly Forecasts were important, because Reficar and Ecopetrol operated under a limited budget [the "**Reficar Budget**" or simply the "**Budget**"]. The Budget had an internal purpose: to control that the overall Project was running as planned, and to ensure that Reficar had sufficient funds for the payments due.

835. The initial Budget had been approved in October 2009 and amounted to USD 3.777 billion[887]. It included not only the EPC costs payable to CB&I, but all other Project-related costs, including sunk costs, owner's costs and Pre-Commissioning and Start-Up ["**PCS**"] costs, which were not included in the Monthly Forecasts prepared by CB&I. Any increase in the Budget had to be approved by the BofD of Reficar and of Ecopetrol, to guarantee that the additional funding was available.

836. In May 2011 Reficar's BofD[888] approved an increase in the Budget to USD 3.994 billion, to account for the Synergy Changes[889]. In total Reficar increased the Budget five times; in its final iteration it amounted to USD 8.016 billion[890].

837. The Budget is an internal Reficar document – there is no reference thereto in any of the Contracts.

B. CB&I increases its Monthly Forecasts

838. The initial months after signing the EPC Contract showed steady progress and little to no change in the Monthly Forecasts prepared by CB&I, with an increase of only USD 1 million by December 2010[891].

839. Starting in 2011, however, the Project began to run into delays: in February 2011 CB&I's Monthly Forecast suddenly indicated a delay in the Mechanical Completion Date from February to October 2013[892]. Three months later, the May 2011 Monthly Forecast showed delays in all activities (apart from engineering)[893].

840. The delay allegations will be addressed separately by the Tribunal (see Section VII.2.3 *infra*), but the fact that CB&I was running behind schedule was relevant to the Project costs and Reficar's Budget.

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[886] See Project Controls Execution Plan, Annex 6 to Onshore and Offshore Agreements, para. 7.1; JX-002, p. 478; JX-004, p. 453.
[887] Ex. R-1848, pp. 14, 17; Ex. R-3708, p. 10 in conjunction with Ex. R-1853_0054, p. 3.
[888] The Tribunal notes that each increase in the control budget was later also approved by Ecopetrol's BofD.
[889] Ex. R-4139, p. 1.
[890] Gutierrez CWS, para. 73, as reflected by Ex. R-4139, p. 1.
[891] LI ER, Attachment 6H-01 (CB&I Actual & Forecast Costs), line "Total Project".
[892] Ex. C-1864, p. 4.
[893] Ex. C-0067, p. 7.

Impact on costs

841. The impact of the delay was not initially reflected in the Monthly Forecasts: in CB&I's January 2011 Monthly Forecast the EPC costs only increased from 3.221 billion to USD 3.251 billion[894]; a mere addition of USD 30 million half a year into the Project. Six months thereafter, the August 2011 Monthly Forecast showed a bleaker perspective: CB&I was now forecasting that the EPC costs would reach USD 3.641 billion[895], a substantial increase of some USD 400 million. The situation worsened in the fall and winter of 2011. The Monthly Forecast for November 2011 showed EPC costs at USD 3.639 billion[896]; the number increased in December 2011 to USD 3.809 billion[897] and was revised in January 2012[898] to USD 3,971 million[899].

842. Note that in one year the Monthly Forecasts had increased more than USD 700 million (from USD 3.2 billion to almost USD 4 billion – a 22% increase).

C. Reficar's reaction

843. Alerted by its consultant Foster Wheeler, Reficar became worried that CB&I might be engaging in practices of profit maximization at its expense[900]. The matter was extensively discussed at the January 2012 Steering Committee, held with the participation of Reficar, Ecopetrol, CB&I and Foster Wheeler[901]. CB&I assuaged Reficar's fears and averred that, notwithstanding the increase, the Project costs were under control[902].

844. As a solution to the exploding cost predictions, Reficar proposed to CB&I to renegotiate the EPC Contract, offering to increase the Bonus Target Cost to USD 3.7 billion[903] and to introduce a system of penalties and benefits that would increase CB&I's interest in controlling Project costs[904]. CB&I's counterproposal accepted the modification of the Bonus Target Cost to USD 3.7 billion, but limited possible penalties against CB&I for cost overruns to USD 30 million[905]. Reficar's BofD rejected CB&I's offer[906].

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[894] LI ER, Attachment 6H-01 (CB&I Actual & Forecast Costs), line "Total Project".
[895] Ex. C-0069, p. 4.
[896] Ex. R-1851_057_00015, fourth tab, in yellow, "Project Summary".
[897] Ex. C-0222, p. 4; Ex. R-1851_057_00016, fourth tab, in yellow, "Project Summary".
[898] Ex. C-0088, p. 4.
[899] Ex. R-1851_057_00017, fourth tab, in yellow, "Project Summary".
[900] Reficar BofD Meeting Minutes of January 24, 2012, Annex 1, "Punto No. 1 - Informe de Foster Wheeler.pptx", p. 8 [under group Ex. 1853; see path: 1853\Contraloria\CARPETA PRINCIPAL 1\Actas Junta Diretiva Reficar 078 a 131CD_Fl 14\Acta No. 79 - Reunión Ordinaria - 24 de enero de 2012].
[901] Ex. C-0089.
[902] Ex. C-0089, p. 4.
[903] Excluding contingencies, see Ex. R-1476, p. 5.
[904] Ex. R-1476, p. 5.
[905] Ex. R-1480, p. 8.
[906] Ex. R-1480, p. 8.

Threat of unilateral termination

845. In parallel to its efforts to renegotiate the Contracts, Reficar threatened CB&I with the possibility of termination – a right to which Reficar was entitled in accordance with the terms of the Agreements and which reinforced its bargaining position[907].

846. The 2007 Project Definition Contract had limited Reficar's right to unilateral termination: in such case CB&I was entitled to receive a fee of USD 50 million, as compensation for the use by Reficar of CB&I's license[908]. But when the Parties negotiated the EPC Agreement, CB&I's right to this fee was explicitly removed[909]; as a result, the EPC Contract grants Reficar the right to unilaterally terminate the relationship with CB&I at convenience, even without any fault on CB&I's part[910], and on terms beneficial to Reficar: termination of the EPC Agreement for convenience does not entitle CB&I to any severance fee and CB&I explicitly waived any claims against Reficar and Ecopetrol for this reason[911].

D. CB&I's Representation Letter

847. To assuage Reficar's fears, on May 22, 2012 CB&I sent a letter to Reficar, signed by its Project Director, Mr. Deidehban[912], in which CB&I reiterated the validity of the USD 3.971 billion cost Forecast [previously defined as the "**Representation Letter**"].

848. But Mr. Deidehban did not only repeat the validity of the Forecast, but he also then went one significant step further. Until now, CB&I had represented that its estimates were at best Class II +/-10%. Now for the first time CB&I formally represented to Reficar that this USD 3,971 million Forecast met the highest requirements of the industry: it complied with the requirements of a Class I +/-5% estimate.

E. The Monthly Forecasts continue increasing

849. Notwithstanding the Representation Letter, the Monthly Forecasts did not stop growing. By September 2012, the Monthly Forecast reached USD 4.221 billion[913] and by October USD 5.467 billion[914], an increase of USD 1.246 billion (or 23%) in just one month. This prompted further alignment meetings, which led to CB&I slightly reducing the forecast to USD 5.371 billion in December 2012[915].

850. As regards the delay in the schedule, in early 2013 as an attempt to stabilize the relations between the Parties, Reficar offered to grant CB&I a 184-day time

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[907] Ex. C-0089, p. 3: "It is critical to demonstrate control with the evolution of the project as, without this, there will be a need to take action outside the contract".
[908] Ex. C-0006, p. 16.
[909] JX-007, p. 46.; also see JX-002, p. 199; JX-004, p. 184.
[910] JX-002, p. 243; JX-004, p. 220.
[911] JX-002, p. 245; JX-004, p. 222.
[912] Ex. R-1849_07396.
[913] Ex. C-0093, pp. 4, 39.
[914] Ex. C-0096, p. 13; the Tribunal notes that the same document offers different ranges for the reforecast at p. 17.
[915] Ex. C-0257, p. 4.

extension to the Guaranteed Completion Date[916]. Mr. Deidehban, however, rejected this proposal, as it "d[id] not sufficiently reflect the agreements reached during our recent schedule and cost alignment discussions"[917] and added, regarding costs, that:

> "Whether the schedule is extended to August 31, 2013, August 22, 2014 or any other date, CB&I is entitled to be compensated for extended performance costs associated with that time extension"[918].

851. By mid-2013 CB&I appeared to have stabilized the forecasted costs and schedule. But then, between July and September 2013, the Project suffered serious labour disruptions, which included work stoppages and a strike. In August there was an explosion in the FCC Unit[919], which impacted on schedule.

852. Using the labour disruptions as its main reason, CB&I once again increased its Monthly Forecast in February 2014, this time to USD 6.27 billion[920], a number which remained relatively stable until the end of the Project, with the final EPC cost projection from December 2015 being slightly reduced to USD 6.214 billion[921].

F. Actual cost of the Project

853. Reficar ultimately paid to CB&I USD 5,908.2 million in EPC costs[922]. Additionally, in the present arbitration CB&I has filed a counterclaim for unpaid Project costs of USD 267.26 million[923]. If both amounts are added, the total Project costs paid by CB&I plus the amounts still under dispute reach up to USD 6,175 million[924].

854. *Pro memoria:*

- A few months before signing of the Agreements, CB&I had delivered to Reficar its final February 2010 Estimate, a Class II +/- 10% work product, which forecasted that the EPC Contract costs would not exceed USD 3.150 billion[925];

- the Bonus Target Cost agreed upon in the June 2010 Agreement was USD 3.221 billion[926];

- in the May 2012 Representation Letter, delivered when construction had already been progressing for almost two years, CB&I submitted to Reficar a

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[916] Ex. C-0101, p. 1.
[917] Ex. C-0102, p. 1.
[918] Ex. C-0102, p. 2.
[919] Ex. C-0113.
[920] Ex. C-0110, p. 5.
[921] Ex. C-0056, tab "Project Summ Cost Report Only", Cell R62 ("TOTAL"); see also LI ER, para. 1180 and Table 9.4-17 therein; see also Attachment 9-02 to LI ER.
[922] CPHB, para. 1, citing to Long International ER, para. 1180 and Table 9.4-17.
[923] CPHB, para. 1, fn. 10. The Tribunal notes that CB&I does not quantify its counterclaim as a total number in USD but instead uses separate numbers for invoices due under the Onshore Contract, in Colombian pesos, and for those under the Offshore Contract, in USD.
[924] 5,908.2+267.26=6175.46
[925] Ex. C-0041, p. 50.
[926] TC 1.1; JX-002, p. 160, JX-004, p. 146.

forecast of USD 3.971 billion, representing that this figure met the Class I +/- 5% requirements;

- the final cost of the Project reached USD 6.175 billion (of which Reficar has already paid USD 5,908.2 million and USD 267 million is to be adjudicated in the counterclaim).

2. THE PARTIES' POSITIONS

855. The case put forward by Claimant is rather simple: acting with contractual *dolo* or gross negligence, CB&I mismanaged the Project and breached the Cost Control Commitments; as a result, the Project suffered cost overruns, which Claimant has paid, and which Claimant is now seeking to claw back.

856. Reficar does not dispute that the Contract is a cost-reimbursable agreement, but emphasizes that the general principle was modified by the more detailed Cost Control Commitments, which imposed on CB&I the duty to only charge for reasonable and proper costs incurred in accordance with the Contract, and to rigorously control costs – something which CB&I failed to do[927].

857. The EPC Contract clearly states that payments made by Reficar do not constitute a waiver of claims and that Reficar may seek to claw back any costs improperly paid[928]; this shows that there could be cost overruns and that Reficar is entitled to claim them back if unreasonable or improper.

Respondents

858. Respondents defend themselves arguing that, conceptually, in a cost-reimbursable EPC Contract there can be no overrun costs, and that the Cost Control Commitments do not change this[929].

859. Pursuant to TC 58.1, the EPC Contract is of indeterminate value, which further reinforces its claims that the Owner is bound to reimburse all costs incurred by the Constructor[930].

860. In any event, Reficar is barred from clawing back any costs, because by paying Reficar reinforced CB&I's expectations as to the finality of all covered costs[931]. In addition, Reficar employed an extensive cost review system, which confirmed the contractual compliance of all approved costs[932]. Reficar contemporaneously had full knowledge of the Project costs, and accepted them as reasonable every time it increased its Budget[933].

[927] CPHB, paras. 192-196; 199-200.
[928] CPHB, paras. 421-425.
[929] RPHB, para. 654; RPHB2, para. 10; H-19, p. 6.
[930] RPHB2, para. 10; RPHB, paras. 111, 153, 586, 629.
[931] RPHB, para. 553.
[932] RPHB2, paras. 4-6, RPHB, paras. 36-46, 60-66.
[933] RPHB, paras. 47-55.

861. Regardless of the above, CB&I always fully complied with the contractual requirements for costs and only invoiced reasonable and proper costs incurred in accordance with the Contract[934].

3. DISCUSSION

862. The Tribunal will address Reficar's claims for unreasonable EPC cost overruns in the following sequence:

- First, the Tribunal will analyse CB&I's duties pursuant to the Cost Control Commitments (**3.1.**);
- Then, it will verify whether CB&I breached the Cost Control Commitments, as claimed by Reficar (**3.2.**);
- As the next step, the Tribunal will quantify the amount of excess costs paid as a consequence of the breaches of the Cost Control Commitments, which Reficar is now entitled to claw back, and in so doing, the Tribunal will address CB&I's defenses that certain categories of costs are Excluded Costs for which it should bear no responsibility (**3.3.**).

3.1. COST CONTROL COMMITMENTS

863. The June 2010 EPC Contract is a voluminous document. The general structure of the EPC Contracts has already been addressed at Section VII.1.1.7[935]. Its nature is that of a cost-reimbursable engineering, construction and procurement contract[936].

864. It is in the very nature of a cost-reimbursable contract that the interests of the owner and constructor are not aligned: since the risk of increased costs or additional delays lies with the owner, the constructor has little incentive to minimize them. To offset the misalignment, CB&I accepted the Cost Control Commitments, which created incentives for the Contractor to be interested in minimizing time and risk: if CB&I failed to treat Reficar's resources as if its own, if it did not rigorously control cost and schedule, or if it incurred unreasonable or improper costs, then it forfeited its right to be reimbursed by Reficar and faced liability for breach of its contractual duties.

865. CB&I accepted these additional obligations, because it wanted to encourage Reficar to change its mind, abandoning its original idea of awarding the construction of the Refinery on a lump sum basis and accepting, instead, a cost-reimbursable structure.

866. CB&I's Cost Control Commitments have two prongs:

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[934] RPHB, para. 575, citing to H-23, p. 34, which in turn cites to Ex. R- 2219_D and Ex. R-2220_D, adding to a total of COP 68 billion and USD 20 million that CB&I incurred but never invoiced to Reficar; also ESOD, para. 1281.

[935] See discussion of the EPC Contracts in the Pre-Contractual Liability section of the Award.

[936] As prescribed under TC 58 "Contract Price" and Section IV "Pricing" of the Onshore and Offshore Agreements; a similar provision may also be found under TC 3 of Section I "Compensation" of the EPC Contracts. The Tribunal notes that Section I is denoted as "Draft May 8, 2010" in exhibits JX-002 and JX-004 received from the Parties.

- CB&I's "**Heightened Diligence Obligation**", under which CB&I pledged to rigorously control cost and schedule, in a similar way to a lump sum contract, and to safeguard Reficar's resources as if their own.

- CB&I's "**Reasonable Cost Obligation**", under which CB&I agreed only to claim reimbursement for costs that were incurred:

  - reasonably,

  - properly, and

  - in accordance with the Contract.

867. The Tribunal will dedicate a separate section to each of the Cost Control Commitments (**3.1.1.** and **3.1.2.**) and then it will address the practical consequences of such provisions (**3.1.3.**).

3.1.1. THE HEIGHTENED DILIGENCE OBLIGATION

868. The Heightened Diligence Obligation is to be found in para. 3 of the Project Execution Plan[937]:

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own". [Emphasis added]

869. The cost reimbursable EPC Contract puts CB&I in a position like that of a mandatary (*mandatario*) in a mandate contract (*contrato de mandato*)[938]: CB&I performs works, and engages others to perform work, for the benefit of the mandator (*mandante*, in this case, Reficar), in consideration of which it is paid a commission (here, a margin on the costs). Mandataries and contractors in cost reimbursable contracts face a similar challenge, because the interests of the mandator (owner) and those of the mandatary (contractor) are not aligned: the mandator/owner wishes to pay a small price for the goods or services engaged, but the higher the price, the bigger the mandatary/contractor's remuneration.

870. The CCC provides certain rules, in an effort to reduce the inherent conflict of interest between mandatary and mandator. Under these rules, a mandatary incurs responsibility vis-à-vis the mandator, if it fails to perform the work entrusted with the "*diligencia y cuidado que los hombres emplean ordinariamente en sus negocios propios*"[939]. Thus, the CCC requires the mandatary to defend the interest of the mandator with the same standard of care as if the assets at risk were his/her own.

871. The Contract follows the same approach; this is the reason why the Heightened Diligence Obligations requires CB&I "to safeguard Reficar's resources as if their

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[937] JX-002, p. 654; JX-004, p. 628.

[938] CCC, *TITULO XXVIII. "DEL MANDATO"*. The Tribunal acknowledges that under TC 5.1 "No Partnership, Agency or Employment Relationship", CB&I is explicitly not an agent under the Contract, nor could it be: CB&I has no authority to bind Reficar into relationships with third parties. This does not mean, however, that the relationship between the Parties did not include fiduciary elements characteristic of the contract of mandate.

[939] Art. 2155 in relation to Art. 63 CCC, emphasis added.

own" – echoing the wording used by the CCC to establish the level of responsibility of the mandatary vis-à-vis the mandator. CB&I agreed that its contractual role would not be that of a mere contractor, without any fiduciary duty vis-à-vis Reficar and without any limitation in the exercise of its contractual rights; instead, CB&I accepted to become a contractor *cum* mandatary, with the obligation to construct the Project and the right to be reimbursed by the Owner, but subject to a fiduciary obligation that all costs decisions taken must safeguard Reficar's resources as if its own.

Respondents' defenses

872. Of the two limbs of the Cost Control Commitments, Respondents focus their defense on the Heightened Diligence Obligation, arguing that they should not be bound by it:

873. First, Respondents say that the Heightened Diligence Obligation is located within the Project Execution Plan, formally an Annex to the Agreements, and not in the main body of the Agreements. The Tribunal notes, however, that the binding, contractual nature of the Project Execution Plan is acknowledged in the very EPC Contract:

> "This Agreement includes [...] the following documents and sections (the "Contract Documents"), which are attached hereto, their respective schedules, exhibits, forms, annexes and appendices, and all subsequent amendments and variations to such documents and sections, and the term "Agreement" in all such documents and sections will be construed accordingly:
>
> Section II Terms and Conditions
>
> [...]
>
> Exhibit 13 – Project Execution Plan".

874. Second, CB&I argues that the nature of the EPC Contract is that of a cost-reimbursable contract of indeterminate value, and a "single sentence" referring to a lump sum contract cannot change this[940]. If the Tribunal finds that it needs to solve this contradiction, it should do so giving preference to the cost-reimbursable nature of the Contract, because according to TC 23, provisions made in the main body trump those contained in the Annexes[941].

875. The Tribunal does not agree.

876. There is no dispute that the nature of the EPC Contract is that of a cost reimbursable agreement, and that the essence of the Contract is that the Owner must reimburse the Contractor for the expenses incurred in the furtherance of the Project. And it is also undeniable that the EPC Contract includes the Cost Control Commitments, which form part of Section IV of the Onshore and Offshore Agreements and of the Project Execution Plan.

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[940] RPHB, para. 654; RPHB2, para. 10; H-19, p. 6.
[941] TC 23.3; JX-002, p. 198; JX-004, p. 183.

877. The Tribunal sees, however, no "conflict between any of the terms of the various documents", which could give rise to the application of TC 23. There is no conflict between the nature of the EPC Contract as an indeterminate value, cost-reimbursable agreement under TC 58, and the Heightened Diligence Obligation, which itself explicitly acknowledges the peaceful coexistence between both terms ("[e]ven though a reimbursable contract [...]"[942]):

- As a cost reimbursable contract, Reficar did not know the exact value of the contract and undertook the obligation to pay costs incurred by CB&I, as opposed to paying a fixed lump sum;

- The Heightened Diligence Obligation does not turn the Contract into a lump sum; it merely imposes a fiduciary duty of care on CB&I when incurring those reimbursable costs.

878. Third, CB&I argues that the Heightened Diligence Obligation only implies that CB&I would be using "cost control tools" applied in lump sum contracts[943], but does not otherwise impose additional substantive duties to CB&I[944].

879. The Tribunal strongly disagrees.

880. The Heightened Diligence Obligation is a contractual source of substantive obligations; it is in the very nature of any contractual provision to create substantive obligations, as acknowledged by the CCC[945]. Hence, Parties are free to contract as they wish, as long as they remain within the limits of the applicable law. No suggestion was made that the Heightened Diligence Obligation lies outside those limits; in fact, CB&I's own expert, Mr. Hackett, acknowledged that the Heightened Diligence Obligation is not an unusual clause in EPC contracts[946] and Prof. Solarte, Reficar's Colombian law expert, testified that the Heightened Diligence Obligation conformed with Colombian law[947].

881. The Tribunal further notes that this qualified standard of care is not unknown to Colombian Law: it is commonly found in *intuitu personae* contracts, where one party relies on the specific skills of the other party and special trust is placed on the performance of those competences – as Reficar placed legitimate trust on CB&I in its performance of contractual and legal duties.

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[942] JX-002, p. 654; JX-004, p. 628.
[943] Tr. 1121:18-1122:10; RPHB2, para. 10; RPHB, para. 654.
[944] RPHB2, para. 10; RPHB, para. 654.
[945] CL-361; RL-473; Art. 1602 of the CCC:
"*ARTICULO 1602. <LOS CONTRATOS SON LEY PARA LAS PARTES>. Todo contrato legalmente celebrado es una ley para los contratantes, y no puede ser invalidado sino por su consentimiento mutuo o por causas legales.*"; English:
Article 1602. Any Contract legally entered into is a law for the contracting parties, and cannot be invalidated except by mutual consent or by legal cause".
[946] Tr. 4508:6-4509:22.
[947] Tr. 4016:23-25.

3.1.2. THE REASONABLE COST OBLIGATION

882. The precise wording of the Reasonable Cost Obligation is to be found in Section IV (on Pricing) of the Onshore[948] and Offshore[949] Agreements, which has an Appendix I (on Contractor's Fixed Fee, Rates and Management Fee):

> "In consideration of the performance by the Contractor of the Work under this Agreement, the Owner will pay the Contractor on a cost reimbursable basis [...] and the amount payable shall be the Contract Price. Only costs which are reasonably and properly incurred by the Contractor in accordance with the Agreement in carrying out the Work shall be paid by the Owner" [Emphasis added].

883. Pursuant to the Reasonable Cost Obligation, CB&I undertook only to charge costs to Reficar, provided that they met the triple set of requirements of being reasonable, proper and incurred in accordance with the Contract.

884. CB&I's position is that all invoiced costs were reasonable and proper. According to CB&I, all invoiced costs were actually incurred to build the Refinery; the money was mostly paid to third parties and not to CB&I or its shareholders and Reficar does not even claim that CB&I diverted or misused the money received[950]. Furthermore, anytime CB&I found that some costs did not meet the reasonableness requirement, they were simply not submitted to Reficar for reimbursement[951]. In this situation, in which Reficar has obtained a world-class Refinery, it should not be allowed to now claim back costs which unarguably went towards its construction[952].

885. The Tribunal is not persuaded.

886. It is undisputed that Reficar now owns a world-class Refinery and that all costs submitted for reimbursement arose out of its construction; the discussion turns around the amount of costs – whether all of them were reasonable and proper and complied with the Contract. CB&I claims that all Project-related costs are, by their own nature, reimbursable, but this statement is contradicted by CB&I's own admission that it did in fact incur certain unreasonable or improper costs, which it chose to not submit for reimbursement[953]. The question is thus, whether there were further costs, which were also not reasonable and proper and should not have been submitted for reimbursement, yet they were – this is, precisely, Claimant's case.

3.1.3. CONSEQUENCES

887. For the purposes of this arbitration, the most salient practical consequences of the Cost Control Commitments are the following:

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[948] JX-003, p. 3.
[949] JX-005, p. 3.
[950] Tr. 3728:10-25.
[951] RPHB, para. 575, citing to H-23, p. 34, which in turn cites to Ex. R- 2219_D and Ex. R-2220_D, adding to a total of COP 68 billion and USD 20 million that CB&I incurred but never invoiced to Reficar.
[952] Tr. 3729:1-15.
[953] RPHB, para. 575, citing to H-23, p. 34, which in turn cites to Ex. R- 2219_D and Ex. R-2220_D, adding to a total of COP 68 billion and USD 20 million that CB&I incurred but never invoiced to Reficar.

A. CB&I's obligation of thrift

888. Under the Reasonable Cost Obligation CB&I undertook to execute the contract thriftily and to control the costs of the Project, by using the same methods, practices and techniques which CB&I would have applied had the risk of cost increases fallen on its shoulders.

889. It is not an absolute obligation of result (*obligación de resultado*), but an obligation of best efforts (*obligación de medios*). It guarantees that CB&I will try to reduce to the extent possible costs incurred (which under the cost reimbursable principle must be assumed by Reficar), applying the same diligence it would have used, had the additional cost been borne by itself.

B. CB&I's obligation of truthfulness

890. The Heightened Diligence Obligation created a fiduciary duty of CB&I vis-à-vis Reficar and imposed a reinforced standard of good faith upon Reficar. CB&I became Reficar's *quasi*-mandatary[954] in the execution of the Contract, entitling Reficar to assume that the forecasts, estimates or schedules delivered, the representations made, or any other information provided by CB&I were truthful, and candidly represented the Contractor's actual belief.

C. Reficar's right to claw back

891. The Parties have discussed whether Reficar has a right to claw back payments of invoices made to CB&I, if it subsequently became aware that the Contractor had breached its Cost Control Commitments, with regard to the cost items reflected in such invoices.

892. The Tribunal will elaborate on this right in the following paragraphs:

893. The EPC Contract (in Section IV "Pricing", Appendix I "Contractors [*sic*] Fixed Fee, Rates and Management Fee") contains detailed provisions on invoicing and review (**a.**) and claw back of reimbursable costs incurred by CB&I (**b.**).

a. Invoicing and review

894. The initial step in the process consists in CB&I submitting an invoice, Reficar reviewing the invoice and, if found correct, paying it. Para. 6.1 "Payment of Reimbursable Costs" of Appendix 1 to Section IV provides the details[955]:

- CB&I should submit invoices on a monthly basis;
- certain categories of costs should be submitted under separate invoices;
- format and content of the invoices were to be agreed between the Parties;

[954] With the qualifications mentioned under fn. 938 above.
[955] JX-003, pp.11-12; JX-005, pp. 9-11; paras. 6.1.1-6.1.4.

- Reficar should review, approve and pay CB&I's invoices within 10 business days of receipt (20 business days in case of reimbursable costs);

- CB&I had a duty to cooperate and to expeditiously provide all information required to facilitate Reficar's review of the invoices.

895. Reficar was then entitled to reject any invoice it found non-compliant with the Contract. Para. 6.1.4 of Appendix I to Section IV stipulates that whenever an invoice

> "cannot be agreed in full, the Owner will notify the Contractor of the value of the undisputed and agreed portion of that invoice, provide a detailed explanation of the discrepancy and request a credit note from the Contractor in respect of the full amount of that invoice"[956].

896. In other words: when CB&I submitted an invoice, Reficar was entitled to review it, and then could accept it in part or in total, or it could reject it providing a "detailed explanation".

b. <u>Claw back</u>

897. The Contract extensively and minutely establishes the consequences of Reficar's failure to identify defects during the review process and of Reficar's payment of invoices which had been improperly submitted by CB&I.

898. TC 4 and TC 58.9 are the relevant provisions.

899. TC 4 provides that Reficar's failure to properly review and the acceptance or payment of any invoices does not release CB&I from any of its obligations[957]:

> "Failure of the Owner to insist upon strict performance of any terms or conditions of this Agreement, or failure or delay to exercise any rights or remedies provided herein or by applicable Laws, or failure to properly notify the Contractor in the event of breach, or <u>the acceptance of or payment for any goods or services under this Agreement</u>, or <u>the review or failure to review</u> designs or make inspections, or a failure by the Owner to discover any instances of non-compliance with this Agreement during any such review or inspection, <u>shall not release the Contractor from any of the warranties or obligations of this Agreement and shall not be deemed a waiver of any right of the Owner to insist upon strict performance under this Agreement</u> [...]" [Emphasis added].

900. TC 58.9 states, in a similar vein, that[958]:

> "58.9 <u>No payment of any invoice</u>, whether in whole or in part, <u>shall at any time constitute approval or acceptance of the Work</u>, or be <u>considered to be a waiver</u>, by the Owner <u>of any of the requirements of this Agreement</u>" [Emphasis added].

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[956] JX-003, p. 12; JX-005, pp. 10-11.
[957] JX-002, p. 175; JX-004, pp. 160-161.
[958] JX-002, p. 236; JX-004, p. 212.

901. The Contract could not be clearer: failure to review an invoice, acceptance of an invoice and even payment of an invoice does not release CB&I from any of its obligations and cannot be considered as a waiver by Reficar of any of the rights agreed upon in the Contract – including CB&I's Cost Control Commitments.

902. CB&I's expert, Mr. Hackett, confirmed at the Hearing that any "unreasonable amount should be disallowable and returned to Reficar"[959] [Emphasis added].

CB&I's counter-arguments

903. CB&I says that Claimant, once it paid an invoice submitted by Reficar, forfeited its right to claw back the amount paid. It provides various arguments to support its position, which the Tribunal finds unpersuasive:

904. First, CB&I maintains that given the extensive review process of invoices on the Project (carried out by Foster Wheeler and Reficar itself), whenever Reficar paid an invoice, it confirmed that the costs were fully compliant with the requirements of the EPC Contracts, including reasonableness and propriety[960]. CB&I also avers that the reasonableness of the costs was assessed contemporaneously by Reficar[961]:

- during the monthly meetings with CB&I in which the Parties discussed costs incurred in the prior month and cost forecasts for the following month[962],
- when it participated in and analysed the comprehensive cost forecasts prepared by CB&I at various stages of the Project[963], and
- when Reficar's cost control department provided analyses and approvals for costs incurred on the Project[964].

905. CB&I also avers that under the stringent Colombian fiscal liability laws, which require compliance under threat of personal liability, Reficar employees would not have authorized any payments without first ensuring the costs' compliance with the Contract, including reasonableness and propriety[965].

906. The Tribunal finds that these arguments fail, because they are directly contradicted by the wording of the EPC Contract. Under TC 58.9 payment of any invoice does not "constitute approval or acceptance of the Work" nor can it be "considered to be

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[959] Tr. 4419:6-23:
"[Q] Based on the EPC contract, if a cost is shown -- a specific cost amount is shown to be unreasonable, that cost, the unreasonable amount should be disallowable and returned to Reficar; correct?
A. [MR. HACKETT] Yes, just that the element of the overall invoice, not the entirety of the invoice, but that, then, has to be accompanied by an explanation of the bit which is not being allowed.
Q. Whatever the cost is that is determined to be unreasonable, this is the unreasonable bucket, whatever it is, that is the amount that is disallowable and returnable to Reficar; yes?
A. [MR. HACKETT] Yes, just the unreasonable element, not the entirety of the bucket from which it's drawn."
[960] RPHB, para. 553.
[961] Ankura ER, para. 40.
[962] Deidehban WS, Section. XI.B.
[963] Deidehban WS, Section. XI.B; Yibirin WS, paras. 90-92, 110-116.
[964] Ex. R-0819, pp. 16-34.
[965] H-19, p. 26.

a waiver, by the Owner of any of the requirements of this Agreement". *In claris non fit interpretatio.*

907. As regards the scope of Foster Wheeler's review of the invoices, this is an issue which the Parties have extensively discussed: CB&I submits that Foster Wheeler verified whether the costs were fully compliant with the EPC Contracts, including for reasonableness and propriety, before submitting them to Reficar for reimbursement[966], while Reficar holds that Foster Wheeler only checked the formalities[967].

908. The discussion really is moot because the extent of Foster Wheeler's review is contractually irrelevant. The wording of TCs 4 and 58.9 does not leave space for doubt: even if it is accepted *arguendo* that Foster Wheeler did review the materiality of the invoices, such procedure would not prevent Reficar from requesting a claw back if CB&I had breached its Cost Control Commitments.

909. That said, the Tribunal tends to agree with Reficar. The better view seems to be that Foster Wheeler intensively reviewed the formalities of the invoices, but not the compliance with the Cost Control Commitments. Mr. Herrera, a Foster Wheeler employee in charge of the invoice review procedure[968], who actually conducted the review, and is therefore the most convincing authority regarding the scope of work performed by Foster Wheeler, denied – without leaving any doubt – having checked the reasonableness of the costs submitted to review. He testified that he had not reviewed "the materiality of it, whether it was cheap or expensive, efficient or inefficient"[969], or whether given sums were "necessary to do the job or [were] excessive to do the job"[970].

910. Second, CB&I invokes TC 59, an EPC Contract provision which allows the Owner to examine and audit any costs within three years after Final Completion and to appoint an accounting firm to resolve disputes regarding overpayments[971].

911. The Tribunal finds that the fact that Reficar decided not to avail itself of this special procedure cannot be held against it. The procedure under TC 59 is only one of the avenues open to Reficar among which it was entitled to choose – an alternative being the initiation of this arbitration procedure under Section 4 of the DRA[972].

912. Third, CB&I argues that Reficar verified Project costs for reasonableness whenever it increased the Budget: the complex pre-approval process[973], followed by an ongoing on-site work review system[974], an elaborate technical and substantive ex-post review[975] and further scrutiny by Reficar's cost controls department and cost committee ensured compliance of all costs with Project requirements; the cost

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[966] RPHB2, paras. 4-6, RPHB, paras. 36-37.
[967] CPHB2, response to RPHB, paras. 61-63 at pdf pp. 8-9; CPHB2, response to RPHB, para. 587 at pdf p. 25; CPHB, paras. 446-448, 459-460.
[968] Tr. 1998:2-11; 2069:20; 2070:3; 2072:3-7; 2075:16-25.
[969] Tr. 2089:24-2090:13.
[970] Tr. 2090:15-2091:2.
[971] RPHB, para. 555, referencing TC 59.
[972] JX-007, pp. 8-13.
[973] RPHB, para. 39-41.
[974] RPHB, para. 44.
[975] RPHB, para. 42-43.

controls department specifically vetted the costs for reasonableness[976]. In addition, the approval of the Budget constituted a commitment by Reficar that it was going to reimburse CB&I[977]. According to CB&I, Reficar never gave a warning that the increases to the Budget were provisional and that they did not constitute an acceptance of the costs as fully compliant with the Contract[978].

913. The Tribunal is also not convinced. The Budgets were not instruments foreseen under the EPC Contract. These were internal Reficar and Ecopetrol resolutions, adopted by their BofDs to guarantee the availability of funding; Reficar's internal rules prohibited it from making any payment to CB&I if such disbursement had not been previously authorized by its BofD. Approval of the Budgets did not mean that Reficar accepted the increases in costs as reasonable and proper. CB&I's averment to the contrary is fully unsupported and it is contradicted by the text of TC 4 and TC 58.9.

914. Fourth, CB&I finally invokes two New York law doctrines that would bar Reficar's recovery of paid invoices: that of unclean hands[979] (i.) and that of voluntary payments[980] (ii.).

915. (i.) Under the doctrine of clean hands, a party is estopped from submitting an equitable claim of restitution, where that party has committed some unconscionable act, directly related to the subject matter in litigation and has injured the counterparty[981].

916. (ii.) The doctrine of voluntary payments bars recovery of payments voluntarily made with full knowledge of the facts, and in the absence of fraud or material mistake of fact or law[982].

917. The Tribunal finds the invoked doctrines to be inapposite:

- (i.) The New York court rulings invoked by CB&I apply the unclean hands doctrine to bar equitable relief: in its improper EPC costs claim Reficar is not bringing a claim for equitable relief, but rather for breach of the Cost Control Commitments under the EPC Contract; nor is there evidence of bad faith on Reficar's side – Reficar has the right to pay and to later question compliance of the Cost Control Commitments.

- (ii.) The second doctrine equally finds no application – while in different circumstances, the voluntary payments of a party might estop it from later bringing claims for such payments, in the present case the Parties agreed under the EPC Contract that no payments by Reficar should constitute a waiver or acceptance of contractual rights[983].

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[976] RPHB, paras. 45-46.
[977] Tr. 3762:18-20.
[978] Tr. 3761:13-18.
[979] ESOD, paras. 1380-1386.
[980] ESOD, paras. 1387-1389.
[981] RL-302, p. 2.
[982] RL-293, p. 2.
[983] TC 4, TC 58.9, analysed under paras. 899 and 900 *supra*.

* * *

918. In light of the above, the Tribunal confirms that, pursuant to TC 4 and TC 58.9, Reficar is entitled to claw back any amounts paid to CB&I, which arose out of a breach by CB&I of its Cost Control Commitments.

3.2. CB&I'S BREACH OF THE COST CONTROL COMMITMENTS

919. The EPC Agreement is not a standard cost-reimbursable construction contract, but rather an agreement where the Contractor accepted to comply with certain Cost Control Commitments:

- CB&I undertook to safeguard Reficar's resources as if its own,
- to rigorously control cost and schedule as if this were a lump sum contract,
- and only to claim reimbursement for costs reasonably and properly incurred in accordance with the Contract.

920. The Tribunal has so far found that the Cost Control Commitments are applicable and that neither Reficar's payment of invoices, nor the adoption of increases to the internal Budget by Reficar's BofD, nor their review by Reficar and/or Foster Wheeler, nor any other argumentation presented by CB&I, relieve Respondents from compliance with these obligations.

921. The Cost Control Commitments have two prongs: the Heightened Diligence Obligation (3.2.1.) and the Reasonable and Proper Costs Obligation (3.2.2.); Reficar says that CB&I breached both. Reficar's EPC cost overrun claim is based on the allegation that, during the execution of the Project, CB&I invoiced to and collected from Reficar significant amounts of money, in breach of CB&I's Cost Control Commitments; as a consequence of this breach, Reficar is entitled to claw back these costs ["**Excess Costs**"][984](**3.3.**).

3.2.1. CB&I'S BREACH OF ITS HEIGHTENED DILIGENCE OBLIGATION

922. Reficar maintains that CB&I breached its Heightened Diligence Obligation by failing to control costs in the EPC Contract, and to apply the same standard of diligence as if it were its own lump sum construction contract[985].

923. The Tribunal concurs.

924. Under the Heightened Diligence Obligation CB&I undertook to "rigorously control cost and schedule", as if the cost-reimbursable EPC Contract were a lump sum contract, and to do so "safeguarding Reficar resources as if their own".

925. The Tribunal has already determined in the preceding Section that the Heightened Diligence Obligation is a contractual source of substantive obligations: by assuming this obligation, CB&I agreed that its contractual role would not be that of a mere contractor, but rather that of a contractor *cum* mandatary; it accepted to execute the

[984] See analysis at Section VII.2.1.3.1.3.C.b *supra*.
[985] CPHB, paras. 195-200.

contract thriftily and to make its best efforts to control costs, by using the same methods, practices and techniques which CB&I would have applied had the risk of cost increases fallen on its shoulders.

926. During the pre-contractual phase, Reficar and CB&I extensively discussed the possibility of structuring the EPC Contract on a lump sum basis – Reficar's initial preference. During these negotiations, CB&I submitted to Reficar a precise calculation of how much the Project would cost under a lump sum approach. In a letter dated November 21, 2008[986] CB&I gave a lump sum price indication of USD 4.561 billion – a USD 907 million surcharge above the total projected costs of USD 3.654 billion.

927. The actual costs which CB&I has incurred, and which it has charged to Reficar, amount to some USD 5.9 billion.

928. In other words: by accepting the cost reimbursable structure touted by CB&I, Reficar ended up paying USD 1.3 billion more than what it would have paid, if it had accepted CB&I's November 2008 quote for a lump sum structure (which already included a conservative USD 907 million surcharge, to protect the contractor against risks).

How could this happen?

929. The Tribunal is convinced that, if Reficar had insisted and CB&I had accepted a lump sum structure, the costs of the Project would not have spiralled out of control. Had this been a lump sum contract, in which CB&I bore the risk of Excess Costs, CB&I would for certain have adopted "rigorous measures" to limit the cost increases and avoid incurring a USD 1.3 billion loss. The time window to diligently react existed: the increase in estimated costs did not occur from one day to the other, but over a protracted period of two years[987]. There is ample evidence that Reficar repeatedly raised with CB&I the issue of

- the cost increases[988], and
- CB&I incurring costs in breach of the Cost Control Commitments[989].

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[986] Ex. C-0018.
[987] See Facts Section above at VII.2.1.1.
[988] See *e.g.*, Ex. C-0089, item 11.0; Rx. C-0094, Ex. C-0095; Ex. C-0097; Ex. C-0104.
[989] See *e.g.*, Ex. C-0104, p. 1 "p. 19: "[…] CBI's serious deficiencies in engineering […] continues [sic] to cause unreasonable and not properly incurred costs"; Ex. C-0296, p. 1 "It is very alarming for Reficar to read the referenced letter from CBI which suggests to us that CBI fails to understand once again the need to control costs in this Project and to manage Reficar's budget within reason and responsibility. As we have repeatedly noted, the mere fact that a cost has been spent by CBI, does not automatically mean that Reficar is required to reimburse it to CBI, for only those costs that have been reasonably and properly incurred are subject to reimbursement by Reficar"; Ex. C-0105, p. 3: "All of CBI's cost estimates, including, but not limited to, the Final Full Estimate, and all of its schedules, from the baseline to the present day, are completely and utterly meaningless, for CBI believes that it can spend whatever it likes and take however long it desires, and Reficar can do nothing other than pay. CBI's position is utterly wrong and grossly misguided, for Reficar is not obligated to pay for costs that are unreasonably or not properly incurred".

930. But there is no counterevidence that CB&I, in response to these requests, adopted meaningful measures to effectively control costs – as it was bound to do under the Heightened Diligence Obligation.

931. What the evidence shows is that CB&I adopted a cavalier attitude towards the increases of costs. This attitude is best reflected in a quote from the examination of Mr. Deidehban, CB&I's highest officer on the Project. Asked by opposing counsel if he agreed that the standard for submitting costs to Reficar "is not just because you incurred costs, that means they are reimbursable", he answered

> "If I incurred costs associated with the work, they are reimbursable"[990].

932. The answer may be good enough in a plain vanilla reimbursable contract, in which the contractor is entitled to recover any cost associated with his work, without any limitation. In the present EPC Contract, where the Owner insisted on Cost Control Commitments to give up its preferred solution of a lump sum structure, and where the Contractor undertook to "rigorously control cost and schedule", as if this were a lump sum contract, "safeguarding Reficar resources as if their own", the attitude is indicative of a breach of the Heightened Diligence Obligation.

933. Weighing the evidence marshalled, the Tribunal concludes that the only plausible cause for the enormous surcharge which the construction incurred can only be one: that CB&I breached its Heightened Diligence Obligation by not rigorously controlling costs as it was a lump sum.

934. This conclusion is reinforced by the following arguments:

935. First, pursuant to the provisions on remuneration in the EPC Contract, CB&I was initially entitled to earn USD 175.75 million[991]. However, the graph below, which is a slide from CB&I's Project Manager Review presentation at the end of the Project[992], retrospectively shows that CB&I's actual expected gross profits were initially limited to USD 135 million but , with the passage of time, CB&I obtained additional returns, eventually arriving at USD 210 million, with an expectation of a total gross profit of USD 225 million. Thus, CB&I predicted, in view of how the Project was developing, that it would make an additional profit of USD 90 million, or over 50% more than agreed with Reficar:

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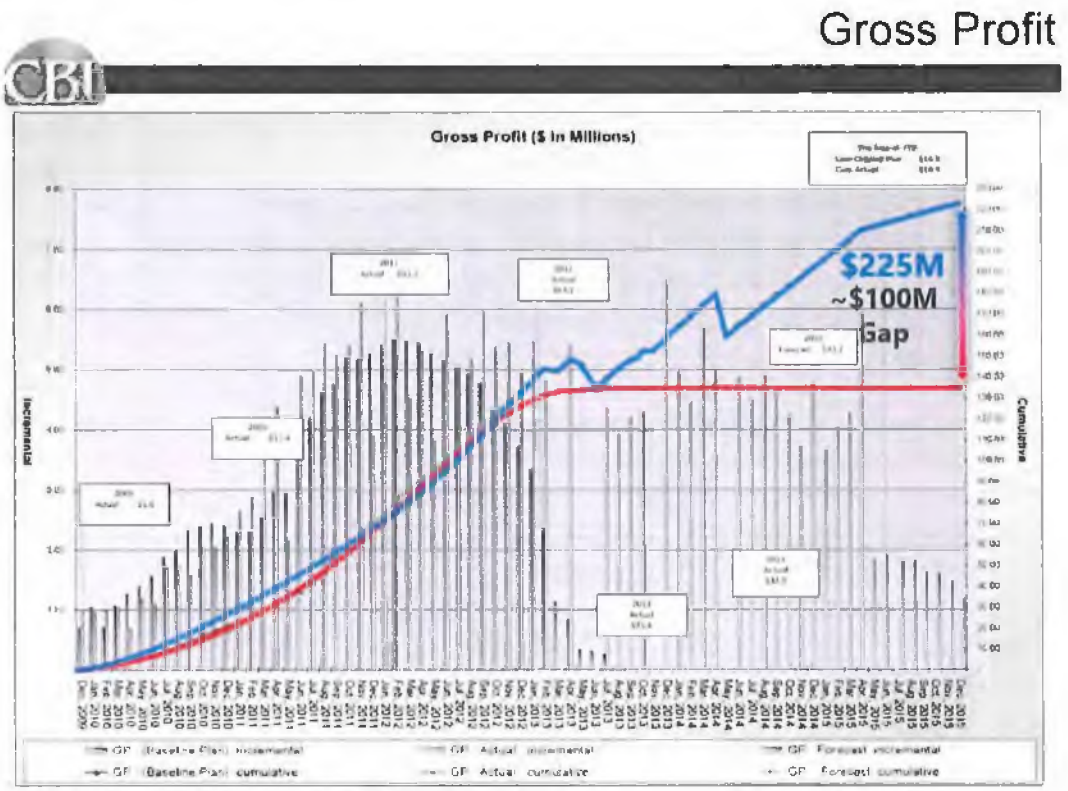
[990] Tr 1127:17 1127:18.
[991] See discussion under Pre-Contractual Liability Section VII.1.1.7.B.
[992] Ex. C-1329, p. 36. The version used by the Tribunal is the one presented by Claimant in CPHB, para. 18.



936. The increase in the profit is explained by CB&I's Mr. Ernest Breaux as follows[993]:

> "[…] In my numerous discussions with CB&I construction block managers and supervisors, their attitude was that since the Project was under a cost reimbursable contract structure, efficiency was not a priority for them. Indeed, the view of CB&I was that the longer the job went on, the more money CB&I would make. The workers understood – as I understood – there was as a mark-up on the hourly rate charged to Reficar for our time and that CB&I made money on each employee on the Project, including my time". [Emphasis added]
>
> [The Tribunal will enter into a detailed discussion of CB&I's profit-motive in the Section on the applicability of the liability cap].

937. Second, the drastic growth in EPC Costs, projected at USD 3.971 billion, by almost 50% to some USD 5.9 billion[994], is likewise indicative of CB&I's lack of adherence to the Heightened Diligence Obligation, absent scope changes, catastrophically unpredictable events or Reficar's improper interferences.

938. Further below, the Tribunal will analyse these two defenses that could exculpate CB&I[995], and will find that neither unpredictable events nor Reficar's negligence can explain the total explosion in EPC costs.

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[993] Breaux CWS, para. 55.
[994] The Tribunal does not include the amounts subject to the Counterclaim in the current analysis.
[995] See discussion under Section 3.3 *infra*.

939. Third, as reflected by the dramatic increase in costs, CB&I also expended exponentially more engineering man-hours than initially planned: the number doubled from 2 million at the beginning of the Project to 4 million[996]; a difference that cannot be explained even when accounting for all scope changes. All three of the Parties' experts agree that CB&I billed for 1-1.3 million engineering man-hours that were "unreconciled or unjustified"[997].

940. Finally, the EPC Contract set the Guaranteed Mechanical Completion Date for February 2013[998]. The Parties agree that the actual Mechanical Completion did not occur prior to February 2015[999], meaning that there was a delay of at least two years[1000].

3.2.2. CB&I'S BREACH OF THE REASONABLE COST OBLIGATION

941. Reficar says that CB&I has also breached its Reasonable Cost Obligation, by charging to Reficar costs which were unreasonable, improper or not due under the EPC Contract[1001].

942. The Tribunal has already found that CB&I *prima facie* breached its Heightened Diligence Obligation. That breach is intertwined with the breach of the Reasonable Cost Obligation: a failure to apply the required diligence in the control of costs will always result in unreasonable and improper costs being incurred.

> To give a (very) simplified example: assume that in a lump sum contract being performed in South America, CB&I pays its U.S. engineers USD 100 per hour, while the equivalent rates charged to Reficar for the same work are USD 300 per hour; in such case Reficar can argue that CB&I has breached both Cost Control Commitments,
>
> - because it is not rigorously controlling resources as it would in its own lump sum contract (breach of the Heightened Diligence Obligation) and
>
> - because CB&I is claiming unreasonable and improper costs (breach of the Reasonable Cost Obligation).
>
> In this situation, Reficar is entitled to withhold payment of the invoice or, if the payment has already been made, to claw back from CB&I the difference of USD 200 per hour.

943. In the above, highly simplified example, determination that CB&I has breached its Cost Control Commitments is straightforward, because there is a ready benchmark: the cost incurred by CB&I in a lump sum contract with equivalent characteristics.

944. In actual facts, Claimant's case is much more complex: Reficar says that it has paid some USD 5.9 billion in EPC costs for a Refinery, and that within that payment the

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[996] Compare: Ex. C-0154, pdf p. 30 and Ex. C-0155, pdf p. 99.
[997] H-027, p. 107; see discussion under Section VII.2.1.3.3.3.A [Engineering].
[998] TC 1, Definitions; JX-002, p. 166; JX-004, p. 152.
[999] CB&I argues that it achieved Mechanical Completion on or before February 2015, see RPHB, para. 172; Reficar argues that Mechanical Completion was only in November 2015, see CPHB, para. 134.
[1000] Responsibility for delay will be addressed in detail in the delay analysis under Section VII.2.3 *infra*.
[1001] CPHB, paras. 195-200.

unreasonable and improper costs amount to approximately USD 1.773 billion[1002], reflected in a myriad of individual invoices.

945. How can the Tribunal determine whether CB&I has charged undue amounts to Reficar, in breach of the Cost Control Commitments, and if it has, how can these amounts be quantified?

946. The answer to these two questions is, in this highly idiosyncratic case, inherently intertwined: any costs determined to be unreasonable will constitute proof of liability for the breach of both Cost Control Commitments and, at the same time, will reflect the amounts to be reimbursed.

947. Reficar proposes the following approach: in a first step the Tribunal should determine the reasonable costs for the Project, using a Modified Total Cost approach; and in a second step it should find that any costs paid in excess of that amount constitute undue costs, incurred in breach of the Cost Control Commitments.

948. CB&I takes issue with Reficar's methodological proposal, but in the next Section the Tribunal will side with Reficar [**A.**], and, within the Modified Total Cost approach, will choose the Bottom-Up methodology [**B.**]. This methodology is based on the use of a "**Reasonable Cost Benchmark**" as an estimation of the reasonable costs, and the Tribunal will have to decide, in view of the evidence before it, which is the best suited Reasonable Cost Benchmark [**C.**].

A. The Modified Total Cost approach

949. To determine which of the costs incurred in the construction of the Project were unreasonable, improper or excessive, Reficar proposes two methodologies[1003] – the Top-Down (i.) and the Bottom-Up (ii.), jointly defined by CB&I's experts as the "Modified Total Cost" approach[1004]. CB&I's experts reject these methodologies and suggest using a third alternative: an invoice-by-invoice analysis (iii.).

950. (i) The Top-Down methodology breaks down Reficar's actual payments into categories of improper EPC costs[1005], arriving at a total number of improper EPC costs paid by Reficar[1006]. The proper costs paid by Reficar are equal to the difference between the actual and improper costs[1007].

951. The Top-Down methodology requires a precise quantification of each single category of costs, to avoid double-counting.

[1002] Communication C-175, pdf pp. 9, 11, 15.
[1003] LI ER, para. 254; communication C-175, pdf pp. 5-6.
[1004] ESOD, paras. 1511-1512. CB&I argues that both Reficar's Top-Down and Bottom-Up approaches in fact employ the Total Modified Cost methodology; this is the case at least for the majority of the Top-Down claims and the entirety of the Bottom-Up claim, see Ankura ER, Sections II.E and II.F and Hackett ER, Section 7.2.
[1005] "E.g., poor labour productivity, rework/corrective work, labour disruptions, labour strike, excessive vendor charges, prolonged project schedule, and excessive construction indirect costs" – see LI ER, para. 263.
[1006] LI ER, paras. 263-270.
[1007] LI ER, para. 269.

952. (ii) The other methodology proposed by Reficar is the Bottom-Up, which compares the actual EPC costs with an appropriate baseline – a level of costs which represents a reasonable estimate on how much the project should have cost [the "**Reasonable Cost Benchmark**"][1008].

953. The difference between actual EPC costs and the Reasonable Cost Benchmark are the "Excess Costs" caused by CB&I's breach of its Cost Control Commitments, for which CB&I bears responsibility.

954. CB&I's experts reject the Modified Total Cost approach (be it in Reficar's Top-Down or Bottom-Up variety), arguing that it is an imprecise and unreliable[1009] estimation, skewed towards the owner, as it assumes that the owner's conduct was perfect and did not cause even a single dollar of cost increase, while the constructor is made responsible for every problem, impact and cost increase in the project[1010].

955. Nonetheless, CB&I's experts acknowledge the use of the Modified Total Cost approach in the industry, especially in situations in which the contractor in a lump sum contract claims to have suffered losses because of cost overruns[1011]. To avoid overstated claims, the application of the Modified Total Cost approach must conform to stringent requirements, such as the contractor proving[1012]:

- That no other means are possible to establish the cost overruns;
- All events contributing to the cost overruns (and loss) must be compensable;
- The contractor did not contribute to the increased costs;
- The bid or estimate was reasonable; and
- The (estimated) actual costs must be reasonable.

956. For these reasons, the experts say that this approach should only be employed "as a last resort" in the "'rare case' where other, more appropriate and precise methodologies are not available" [1013].

957. (iii) CB&I's experts would favour the use of a more precise and reliable method: the invoice-by-invoice analysis of the reasonableness of the costs, which is precisely the methodology used by CB&I's experts to calculate the damages in CB&I's Counterclaim[1014].

[1008] LI ER, paras. 255-262.
[1009] ESOD, paras. 1511, 1516.
[1010] Ankura ER; para. 271.
[1011] ESOD, para. 1512. Ankura, para. 50.
[1012] ESOD, para. 1514.
[1013] ESOD, para. 1513, citing to *Andron Const. Corp. v. Dormitory Auth. of State of New York, 51 Misc. 3d 1217(A), 38 N.Y.S.3d 830, (N.Y. Sup., Albany Cnty., 2016), Servidone Constr. Corp. v. United States, 931 F.2d 860, 861– 62 (Fed. Cir. 1991) and Geolar, Inc. v. Gilbert/Commonwealth Inc. of Michigan, 874 P.2d 937, 944 (Alaska 1994).*
[1014] Ankura ER, paras. 324-329, JER, item 111, pp. 177-182. The Tribunal notes that this statement is an oversimplification: the invoice-by-invoice analysis was actually carried out on samples of invoices, not on the totality of them.

The Tribunal's analysis

958. The Tribunal acknowledges that the Modified Total Cost approach is inherently less accurate than other methods of calculating cost overruns, especially when compared with a scrutiny of the reasonableness of each individual invoice.

959. But in the present claim, exceptionally complicated and voluminous, where the total number of invoices issued nears 20,000[1015], the invoice-by-invoice methodology suggested by CB&I does not constitute a feasible alternative. The solution proposed by CB&I's experts would require that the Parties and the Tribunal analyse and review, from a substantive point of view, the totality of invoices – a herculean task, from which, most tellingly, CB&I and its numerous experts have shied away: Respondents themselves have not provided the Tribunal with an alternative analysis of Reficar's claims, based on the review of the totality of invoices (or on any other methodology).

960. The Tribunal, thus, believes that this case warrants the use of "last resort" overrun cost determination approaches, such as the Modified Total Cost approach, which Respondents' experts accept, provided that certain requirements are met.

961. The requirements set out in para. 955 *supra* are narrated from the perspective of a contractor, who claims overrun costs; the situation is similar to the present case, in which the owner claims a right to claw back overrun costs, but not identical – hence not all requirements can be extrapolated:

- No other means are possible to establish the cost overruns: given the staggering number of invoices, it would be impracticable for Reficar to prove its actual losses directly, by individually assessing the unreasonableness of each of the nearly 20,000 invoices;

- All claimed amounts must be compensable: the Tribunal will make sure that Reficar only claws back overrun costs incurred as a consequence of breaches of Cost Control Commitments;

- Reficar did not contribute to the increased costs: the Tribunal will not compensate Reficar for overrun costs caused by Reficar's own instructions or its fault;

- The cost estimate was reasonable: this requirement prevents a contractor from presenting an artificially low cost estimate and later claiming the difference in actual costs – in the same vein, the Tribunal will carefully select the cost estimate against which the reasonableness of costs is measured, to ensure that it is neither artificially low, nor unduly inflated as will be seen in section c. below;

- The (estimated) actual costs must be reasonable: this requirement avoids that the Modified Total Cost approach be used to claim disproportionate amounts – the estimated actual costs must, therefore be within a reasonable range; in this case, however, the actual costs need not be estimated, because there is

[1015] CPHB, para. 423 and Reply, para. 208, citing to Ex. C-1078.

certainty of how much Reficar paid; the Modified Total Cost approach is not used to estimate the actual costs, but to establish the portion of actual costs which is reasonable – there is, thus, no risk that Reficar abuses the imperfections of the Modified Total Cost for its own benefit: it cannot claim more than it actually paid.

B. Top-Down or Bottom-up?

962. The next step is to decide which of the two approaches is the optimal one in the circumstances of the current arbitration.

963. In the present case, the Top-Down methodology is fraught with risk of double-counting – certain categories of costs may be (and indeed are) encompassed by others, as is shown by the fact that Reficar lists multiple heads of claims of allegedly improper costs, but does not quantify all of them, *e.g.* for materials management, contract administration or change management[1016].

964. To avoid this risk, the Tribunal prefers the Bottom-Up approach. Under this methodology, the Excess Costs caused by CB&I's breach of its Cost Control Commitments, for which CB&I bears responsibility, are calculated as the difference between

- a Reasonable Cost Benchmark, properly established and then properly adjusted taking into consideration CB&I's defenses, and
- the actual EPC costs paid to CB&I.

C. Alternatives for a Reasonable Cost Benchmark

965. As a first step, the Bottom-Up approach requires the establishment of a Reasonable Cost Benchmark.

966. Each Party has suggested the use of a different Reasonable Cost Benchmark:

- CB&I favours the use of two cost studies performed by Ecopetrol[1017] (**a.**)
- Reficar proposes the use of the Bonus Target Cost with certain adjustments (**b.**).

967. The Tribunal will ultimately discard both suggested benchmarks and opt for a third benchmark, which satisfies the requirements a Reasonable Cost Benchmark should meet (**c.**)

a. Benchmarking Studies

968. In 2013 Ecopetrol commissioned Mr. Pittaluga, who had started working for Reficar's consulting firm IPA and then moved to Ecopetrol, to prepare a Benchmarking Study, comparing the costs of the Cartagena Project with 25 similar

[1016] Communication C-175.
[1017] The Tribunal notes that CB&I also uses the internal Reficar and Ecopetrol Budgets as an alternative Reasonable Cost Benchmark, but the Budgets were of no relevance to CB&I under the EPC Contract, see Section VII.2.1.1.A.

refinery projects around the globe[1018]. The results of this study were reiterated in a 2014 edition, which compared a total of 31 projects[1019].

969. The methodology consisted in weighing the actual or expected cost of refinery projects in various countries, which had been recently finalized or which were expected to be finalized up to 2019, by various factors, including capacity and complexity – the Cartagena Refinery being the second most complex project in the population. The 2013 Study comes to the conclusion that "*Reficar a pesar de tener un alto grado de complejidad, su costo no está entre los mayores*" and that "*no se observa un sobrecosto*"[1020].

970. The Study then applies a similar methodology to a population of projects increased to 32. The conclusions are similar: "*no se observa sobrecosto*"[1021] and, given the complexity of the Cartagena Project, its expected costs, using international benchmarking, should be a figure in excess of USD 9 billion[1022].

971. CB&I refers to these studies to support that no Excess Costs were observed on the Project[1023] and that Ecopetrol could, in fact, have expected to incur USD 1.2 billion more on the Project than it actually did[1024]. CB&I's opinion is buttressed by its expert, Mr. Gray[1025]. CB&I remarks that, during his interrogation before the *Contraloría*, the author of the studies confirmed that they were prepared with the highest possible degree of accuracy[1026].

972. The Tribunal begs to differ.

973. The Benchmarking Studies are in fact two short power points, prepared by Mr. Pittaluga, an employee of Ecopetrol. The power points are on their very face of extremely low quality. The reliability of the data used and of the methodology applied is very doubtful:

- The comparator projects have varying termination deadlines: some had already been finished, others were expected to be completed by 2019; and this, of course, impacts the real costs of each project;

- The data were extracted by Mr. Pittaluga from the internet, because he no longer had access to the verified information in the database of his previous employer; in a Witness Statement Mr. Pittaluga also acknowledged that he did not include certain costs[1027] and that he was unable to verify the accuracy of the data[1028];

[1018] Ex. R-0915, p. 2 (English at p. 16).
[1019] Ex. R-1423, p. 205.
[1020] Ex. R-0915, pp. 9-10 (pp. 23-24 for English: "Despite having a high degree of complexity, Reficar's cost is not among the highest"; "There is no excess cost observed").
[1021] Ex. R-1917, p. 14 (English at p. 31).
[1022] Ex. R-1917, p. 11 (English at p. 28).
[1023] Ex. R-0915, p. 10 (p. 24 for English).
[1024] RPHB, para. 57, citing to Ex. R-1917, p. 14 (English at p. 31).
[1025] Ankura ER, para. 361, see also JER 6 on Claimed Costs & Quantum, Issue no. 116.
[1026] RPHB, para. 61, citing to Ex. R-3664, pp. 20 and 22.
[1027] Pittaluga CWS, para. 24, when speaking of Outside Battery Limit costs.
[1028] Pittaluga CWS, paras. 23-24.

- The analysis is not based on the actual costs of the comparator projects, but these costs are weighed by a complexity factor; the higher the complexity, the higher the justifiable cost; the Cartagena Project is considered as the second (in the 2014 Study, the fourth) most complex Project – the weighing by complexity introduces a subjective factor and helps to justify the higher costs incurred in Cartagena.

974. Unsurprisingly, the 2014 Study commences with the following *caveat*:

> "*Se aclara que el presente análisis NO CONSTITUYE UN ESTUDIO QUE VALIDE O APRUEBE LA GESTIÓN DE CBI O CUALQUIERA OTRO CONTRATISTA*" [Capitals in the original][1029]

975. All in all, the Tribunal does not attach evidentiary weight to the Benchmarking Studies. These look like internal papers, hastily prepared by Ecopetrol from open sources, applying a suspect methodology, as an in-house justification for the decisions adopted by its management. The studies in no way prove or disprove whether CB&I complied with its contractual obligations: the Tribunal's mission is to scrutinize the costs of the Project in accordance with the requirements of the Contract – not to compare these costs, weighed by the complexity of the project, with those of other refinery construction projects, which were under construction in the first two decades of the century.

976. The Tribunal also notes that another benchmarking study, prepared by the Jacobs consultancy in August 2013, recognized that such studies are inherently difficult and offer findings of low accuracy[1030].

> "Jacobs commissioned a study comparing the Refinery to a similar South American refinery. Jacobs concluded that the Project costs could surpass those of the comparative refinery, noting that benchmarking in general was 'difficult since differences in site conditions and scope have a large influence on the cost' and that the benchmarking was suitable only for "an order of magnitude comparison" [Emphasis added, citation omitted].

977. The Tribunal thus finds that the Benchmarking Studies are not an appropriate standard to establish the reasonableness of costs incurred on the Project.

b. The Bonus Target Cost

978. Reficar's proposal is to use the Bonus Target Cost from the EPC Contract adjusted by applying the following factors[1031]:

- difference between the productivity factors[1032],

[1029] Ex. R-1917, p. 2 (English at p. 19: "Note that this analysis DOES NOT CONSTITUTE A STUDY THAT VALIDATES OR APPROVES THE MANAGEMENT OF CB&I OR ANY OTHER CONTRACTOR")
[1030] ESOD, para. 1183, citing to Ex. R-1488, p. 131.
[1031] A more detailed breakdown of the cost adjustments may be found at Table 2 in Communication C-175, at p. 5.
[1032] LI ER, para. 256.

- the increase in material and equipment quantities[1033],
- scope changes and additional services[1034], and
- increases in costs due to justifiable delay[1035].

979. Ankura, CB&I's expert, calls the Bonus Target Cost "an arbitrary budget amount"[1036], because when the EPC Contract was signed, the scope of work had not been completely defined[1037]. Ankura adds that other contemporaneous oil and gas projects, especially in Latin America, were plagued by cost overruns[1038], reinforcing the conclusion that a value established when the Contract was signed cannot represent a reliable Reasonable Cost Benchmark. Ankura's findings are confirmed by CB&I's other expert, Mr. Hackett[1039].

980. The Tribunal shares the criticism by CB&I's experts. The Bonus Target Cost, a quantity established when the EPC Contract was signed, is not an adequate parameter:

- The Bonus Target Cost was based on the February 2010 Estimate, a projection which did not even meet the requirements of AACE Class 2 +/- 10% accuracy;
- It was quantified at the beginning of the Project, when many variables and cost factors remained difficult to gauge (for example, the second round of BRNs was only submitted half a year thereafter and the implications of the Synergy Changes were just partially quantified[1040]).

981. The Tribunal consequently shares CB&I's position that the Bonus Target Cost cannot be reliably used as a Reasonable Cost Benchmark.

c. The Representation Forecast

982. The Tribunal has so far accepted Claimant's case that the Bottom-Up methodology is suitable to establish the breach of the Reasonable Cost Obligation; thus, a Reasonable Cost Benchmark must be set. The Tribunal does not share CB&I's proposal to use the Benchmarking Studies, nor Reficar's to resort to the Bonus Target Cost. The Tribunal further notes that each of these proposals is located at the end of the cost range: Claimant suggests using one of its early (low) budget estimates, while Respondents favour the figure shown in some studies which is even bigger than the actual costs incurred in the Project.

983. In the Tribunal's opinion, taking into consideration some of the criticisms put forward by CB&I, the ideal Reasonable Cost Benchmark against which the

[1033] LI ER, para. 257.
[1034] LI ER, para. 258.
[1035] LI ER, para. 259.
[1036] Ankura ER, para. 33.
[1037] Ankura ER, paras. 135-141; WMC ER, Sections 3.4.2-3.4.3.
[1038] Ankura ER, paras. 294-302.
[1039] Hackett ER, Sections 4.5 and 7-2.-7.3.
[1040] Ex. C-0046; Ex. C-0047, p. 9.

reasonableness and propriety of costs incurred by CB&I should be measured, must meet a number of requirements:

- It should be an estimation prepared by CB&I, and delivered to Reficar;
- It should have been prepared not at the initial stages of the Project, when there were still unknown risks, but rather at a stage of construction where the Constructor already had full knowledge of the real circumstances affecting the Project;
- It should meet the requirements at least of a Class 2, +/-10% AACE and, preferably, of a Class 1, +/- 5% AACE estimate[1041]; and
- Both Parties should have accepted it as a reliable cost projection.

984. There is a cost estimation in the record – the Representation Forecast – which meets all Reasonable Cost Benchmark requirements: the December 2011/January 2012 Monthly Forecast, which estimates that EPC costs will amount to Class I +/-5% USD 3,971 million.

985. By the fall of 2011, a year and a half into the execution of the EPC Contract, Reficar was highly dissatisfied with CB&I's progress – at that point, the Project was suffering from severe delays and CB&I was reassessing the cost of the Project[1042]: the Monthly Forecast for November 2011 estimated EPC costs at USD 3,639 million[1043]; the number increased in December 2011 to *circa* USD 3,809 million[1044] and was revised in January 2012[1045] to USD 3,971 million[1046].

986. Reficar became very worried by CB&I's sudden increases in forecasted costs. Foster Wheeler warned Reficar's January 2012 BofD that CB&I was engaging in practices of profit maximization at Reficar's expense and advised to renegotiate the EPC Agreement[1047].

987. And so the issue was brought up in the January 2012 Steering Committee, held with the participation of Reficar, Ecopetrol, CB&I and Foster Wheeler. During the

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[1041] The only material difference between the AACE's Class 2 and Class 1 estimate is that the former has an accuracy range of -5 to -15%/+15 to 20%, and the latter a range of -3% to-10%/+3% to +15%; see Ex. B-001, p. 3. However, during the Hearing, it was confirmed that what was understood under the Project was that Class 2 meant +/-10% accuracy, and Class 1 meant +/-5% accuracy. See *e.g.*, Tr. 1302:15-21; Tr. 2414:22-2415:7; Tr. 2656:21-25; Tr. 3660:3-6.

[1042] Ex. C-0070, pp. 5-6 "Pedro Rosales highlighted that it is unacceptable that project delays are increasing without actions and results [...]. Pedro Rosales wished to avoid being distracted by individual specifics. The main message was that any steps that are taken to avoid negative events, in the end, do not have results. [...] The resulting action is for CB&I to generate a project recovery plan, supported by challenging execution strategies, focused on completion on the 28 Feb 2013, and to table this for communication to the team as a matter of urgency"; see also Ex. C-0086, pp. 2-3; Ex. C-0087, p. 4.
to the team as a matter of urgency."

[1043] Ex. R-1851_057_00015, fourth tab, in yellow, "Project Summary".

[1044] Ex. C-0222, p. 4; Ex. R-1851_057_00016, fourth tab, in yellow, "Project Summary".

[1045] Ex. C-0088, p. 4.

[1046] Ex. R-1851_057_00017, fourth tab, in yellow, "Project Summary".

[1047] Reficar BofD Meeting Minutes of January 24, 2012, Annex 1, "Punto No. 1 - Informe de Foster Wheeler.pptx", p. 8 [under group Ex. 1853; see path: 1853\Contraloria\CARPETA PRINCIPAL 1\Actas Junta Diretiva Reficar 078 a 131CD_Fl 14\Acta No. 79 - Reunión Ordinaria - 24 de enero de 2012].

meeting, Mr. Rosales, the vice president of Ecopetrol[1048], transmitted to CB&I the political relevance of the Project, Reficar's lack of satisfaction with CB&I's performance and a veiled threat of terminating the relationship[1049]:

> "Pedro Rosales highlighted that these [sic] was a high level of interest within the government on the progress of the project. It is critical to demonstrate control with the evolution of the projects as, without this, there will be a need to take action outside the contract. Once agreement on targets are reached, these cannot be changed, otherwise there will be high pressure for Reficar to take action [...] Commitment from CB&I to the plans [to reduce costs] is critical" [Emphasis added].

988. Since Reficar had the contractual right to unilaterally terminate the Contract under highly beneficial terms[1050], Mr. Rosales's threat must have sounded real to CB&I: its Project Director, Mr. Deidehban, defended himself as best as he could, averring that the Project was under control, and deflected Mr. Rosales's worries by undertaking to perform a detailed review of costs[1051].

989. To comply with this objective, the Parties held a number of cost alignment workshops in February 2012[1052], with the goal of reducing the January 2012 monthly forecast number to USD 3.7 billion, a figure acceptable to Reficar[1053].

990. By the end of February 2012, after the conclusion of the alignment workshops, Reficar wrote to CB&I, stating that the forecasts contained errors, lacked proper backing and were based on inaccurate forecasting methods[1054]; for example, line-items without any support added up to almost USD 751 million[1055]. As a result, Reficar requested that CB&I re-issue the December/January reports before issuing the February 2012 report[1056].

991. CB&I, however, did not agree, and kept showing in its monthly forecasts the same figure used for December 2011 and January 2012: USD 3,971 million[1057], and only referred to USD 3.7 billion as "Reficar Target"[1058] – this, no doubt, must have caused tensions with Reficar.

992. To assuage Reficar's worries and to provide further support to the December 2011/January 2012 Forecast, on May 22, 2012 CB&I sent the a letter to Reficar,

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[1048] Tr. 2312:19-25.
[1049] Ex. C-0089, pp. 3-4.
[1050] JX-002, p. 243; JX-004, p. 220.
[1051] Ex. C-0089, p. 4.
[1052] Ex. R-1849_07396, pp. 7-28.
[1053] Ex. C-0090, p. 28. The slide contains a typo: the Cost Forecast February 2010 was in fact for February 2012.
[1054] Ex. R-1849_12447, p .1.
[1055] Ex. R-1849_12447, p .1.
[1056] Ex. R-1849_12447, p. 3.
[1057] Even though the amount of USD 3.971 billion comes from the December 2011 Revision 1 and the January 2012 cost forecast, the Parties refer to this number as the February 2012 Forecast based on its appearance as such in later Project documents. See e.g. Ex. R-1383, p. 13. The Tribunal has opted to refer to the number as the December 2011/January 2012 Forecast, as this is more accurate and also reflects Mr. Deidehban's representations in the May Letter.
[1058] Ex. C-0096, p. 13, column number 3: "CB&I Forecast (A) of 3,971,000,000" vs "Reficar Target (B) of 3,700,000,000".

signed by CB&I's Project Director, Mr. Deidehban[1059] [previously defined as the "**Representation Letter**"].

993. The Representation Letter's starting point was to reiterate that CB&I's reporting met all requirements under the Agreement. But then he added – *sua sponte* – a specific representation that the December 2011 and January 2012 forecasts of USD 3,971 million were not only correct[1060], but that they were so accurate that they even complied with the highest requirements of a Class I +/-5% estimate.

994. The precise words which CB&I used to convey this representation are these:

> "CB&I cost and schedule forecasts are within the range established by a class I estimate (either cost or time)"[1061];

and

> "The Cost Forecast of 3,971 MM issued in the December Revision 1 and January 2012 reports is both properly reported and within the definition of a Class I estimate as defined by the various national and international professional societies and associations"[1062]. [Emphasis added]

995. It is noteworthy that CB&I, spontaneously, vouched that these estimates were so precise that they actually met the higher threshold of Class I (so far, all estimates had been reported as Class II at best).

996. For good measure, Mr. Deidehban added:

> "It is CB&I's responsibility to provide Reficar with the most probable forecast based not only on the information available at the moment, but also on the best practices for cost control which have been established throughout the EPC industry. The revised Cost Forecast of $ 3,971 MM includes such practices". [Emphasis added]

997. CB&I has tried to minimize the relevance of the Representation Letter:

998. First, it argues that "CB&I's letter referred to certain elements within the forecast as meeting estimate definitions"[1063]. But the very wording of the Representation Letter belies Respondents' argument: it does not refer to certain "elements", but states in unfettered terms that the cost forecast meets the definition of Class I as defined by professional bodies.

999. Second, CB&I discusses the impact of a list with 14 exceptions attached to the Representation Letter[1064].

[1059] Ex. R-1849_07396.
[1060] TC 1 Definitions; JX-002, p. 165; JX-004, p. 151: ""Final Full Estimate" means the estimate which is set out in Appendix IV to Section III, which amends the detailed Class 2 cost estimate (on a +/- 10% basis) which was delivered by the Contractor and Technip to the Owner on 31 July 2009". [Emphasis added]
[1061] Ex. R-1849_07396, p. 2.
[1062] Ex. R-1849_07396, p. 3.
[1063] RPHB2, para. 8.
[1064] RPHB2, paras. 8-9, citing to Ex. R-1849_07396, p. 6.

1000. In fact, the list with 14 items does not appear for the first time attached to the Representation Letter. CB&I had previously discussed this list with Reficar, and Reficar had already expressed worries about its potential impact[1065]. In an Executive Review Meeting (in which the Parties were trying to reduce the USD 3,971 million figure to USD 3.7 billion) CB&I had reassured Reficar that these exclusions were not included in the Representation Forecast, precisely because CB&I did not anticipate incurring costs for these categories[1066].

> 10.0 The cost forecast of $3.7bn was reviewed and noted that certain exclusions apply. CB&I confirmed that they do not anticipate incurring costs for these exclusions and therefore are not in the forecast. Reficar clarified that there is no provision for fuel for construction in Owners Costs.

[The quote refers to the USD 3.7 billion number, because that was the level the Parties were trying to achieve[1067]. It also applies to the USD 3,971 million represented by Mr. Deidehban, as the exclusions were identical[1068].]

1001. By making these statements, CB&I represented to Reficar that:

- It only foresaw 14 possible exceptions to the Representation Forecast; and
- It did not anticipate incurring costs regarding those exceptions.

* * *

1002. Why did Mr. Deidehban, at this stage of the construction, commit CB&I to such high and unprecedented standard?

1003. The record does not provide a clear answer, but the Tribunal feels that Reficar's threats to terminate the Contract with CB&I, and to entrust construction to an alternative constructor, was the compelling and decisive factor.

1004. And, at least initially, CB&I's strategy seems to have been successful, because Reficar, upon receiving the assurances contained in the Representation Letter, desisted from the idea of terminating the Contract, and decided to continue with the Project in CB&I's hands. But CB&I's promise soon evaporated and costs started to exceed the thresholds of the USD 3.971 Representation Forecast. The tensions between Owner and Contractor resurfaced – eventually leading to the present arbitration.

[1065] Ex. R-1903, p. 8, showing that the same list was discussed in February 2012 – the only difference in the slides is that the list discussed in February 2012 contained a typo and stated that "This Alignment is as of December 2012", while in fact it was December 2011, as correctly stated in the slide attached to the Representation Forecast.
[1066] Ex. C-0827, p. 3 (point 10).
[1067] Ex. R-1849_07396, p. 3: "It should be understood that the forecasted Target Cost at Completion (TCC) of $3.700 MM, was ultimately set as a Target that excludes Owner's costs, remaining contingency and allowances against existing PO commitments".
[1068] Compare: Ex. R-1903, p. 8 and Ex. R-1849_07396, p. 6.

1005. Reficar submits that it was entitled to place, and that it actually placed, special trust on CB&I's Representation Letter and the USD 3,971 million Representation Forecast[1069] and the Tribunal sees good reasons to believe that it was actually so.

1006. Hence, in the Tribunal's *prima facie* opinion, this USD 3,971 million Forecast does constitute a Reasonable Cost Benchmark, as it fulfils the Tribunal's criteria:

1007. First, the Reasonable Cost Benchmark is an estimate prepared by CB&I and then delivered and reviewed by Reficar.

1008. Second, the Reasonable Cost Estimate was prepared well into the EPC phase of the Project, at a time when CB&I had actual experience in the Cartagena location, was aware of the idiosyncrasies affecting Reficar as a public company, was knowledgeable of the actual productivity of labour in the location and the scope of the Project was (almost) finalized.

1009. Third, CB&I specifically represented in the Representation Letter to Reficar that the Reasonable Cost Estimate boasted an accuracy of Class I +/-5%[1070].

1010. Fourth, it was accepted by both Parties as a reliable cost projection: CB&I was prepared to vouch that this projection met the stringent requirements of being a Class I +/-5% estimate, and Reficar shelved its plans of terminating the Contract with CB&I and of entrusting completion of the Project to a different constructor.

3.3. QUANTIFICATION OF REFICAR'S CLAW BACK

1011. The general principle in a cost-reimbursable construction contract is that the risk that the project results in higher costs than anticipated is assumed by the owner. But the Tribunal has already found that, in the EPC Contract the above general principle is more nuanced: because CB&I, to assuage Reficar's reluctance to give up the initially agreed lump sum structure, was willing to assume stringent Cost Control Commitments in favour of the Owner:

- Under its Reasonable Cost Obligation, CB&I agreed only to claim reimbursement for costs that were incurred reasonably, properly, and in accordance with the Contract; and

- Under its Heightened Diligence Obligation CB&I pledged to rigorously control cost and schedule similar to a lump sum contract, and to safeguard Reficar's resources as if its own.

1012. Reficar says that it has paid USD 5,908.2 million in EPC costs for the Refinery, and within that payment there were significant unreasonable and improper costs, which CB&I incurred in breach of its Cost Control Commitments[1071]. Reficar's main claim is that CB&I repay these monies.

[1069] CPHB, paras. 11-13, 25, 197; see also paras. 53-56, 110, 194 about the relationship of special trust between the Parties and Reficar's legitimate trust on CB&I's representations.
[1070] Tr. 1234:6-15.
[1071] Communication C-175, pdf pp. 9, 11, 15.

Excess Costs

1013. The Tribunal has already decided that in the present case the only viable methodology to determine whether CB&I has indeed breached its Cost Control Commitments, and to establish the precise amount of the Excess Costs charged to Reficar, is the so-called Bottom-Up approach. Under this methodology, the Excess Costs are calculated as the difference between:

- the actual EPC costs paid by Reficar to CB&I: it is undisputed that Reficar ultimately paid to CB&I USD 5,908.2 million in EPC costs[1072] (additionally, there is a counterclaim of USD 267.26 million[1073], which the Tribunal will analyse separately, to ascertain whether these are properly incurred costs); and

- a Reasonable Cost Benchmark, which meets the criteria defined by the Tribunal in the preceding Sections and amounts to USD 3,971 million[1074].

1014. Thus, Excess Costs amount to USD 1.937.2 million.

Excluded Costs

1015. CB&I has argued, as a defense against that *prima facie* quantification, that some of those Excess Costs were not caused by a breach of its Cost Control Commitments, and thus Reficar should not be entitled to claw them back[1075]. The Tribunal accepts the premise that, within those Excess Costs, there may indeed be certain items, for which CB&I, notwithstanding its breach of the Cost Control Commitments, should not bear responsibility, because these Excess Costs were caused by factors outside its scope of control ["**Excluded Costs**"].

1016. Following CB&I's line of argumentation, to qualify as an Excluded Cost, any Excess Cost item must meet the following two requirements:

1017. First, the item must not have been foreseeable as of December 31, 2011[1076] [the "**Cut-Off Date**"], *i.e.*, the date as of which CB&I represented to Reficar that the USD 3,971 million Representation Forecast constituted a Class I estimate; for this reason, the Representation Forecast must be deemed to include all costs, which CB&I could foresee with the information available as of the Cut-Off Date. Had CB&I been concerned at that time that there were future costs, that escaped its scope

[1072] Ex. C-1181; CPHB, para. 1, citing to Long International ER, para. 1180 and Table 9.4-17.
[1073] CPHB, para. 1, fn. 10. The Tribunal notes that CB&I does not quantify its counterclaim as a total number in USD but instead uses separate numbers for invoices due under the Onshore Contract, in Colombian pesos, and for those under the Offshore Contract, in USD.
[1074] The Tribunal notes that the Representation Forecast had an accuracy margin of +/-5%. Because this margin of error in the cost estimation could go both upwards and downwards, the Tribunal accepts the figure of USD 3,971 million, with no adjustment, as the Reasonable Cost Benchmark.
[1075] See *e.g.*, Section V of the ESOD, with multiple arguments about Reficar and Ecopetrol's interferences in the Project.
[1076] The Tribunal notes that there is no day for which the Representation Forecast was made specifically, but on the basis of the fact that it was given as of the month of December, it is safe to assume that the final day of that month should constitute the Cut-Off Date.

of control, it should have disclaimed responsibility at that time; but it did not[1077], and so it assumed liability for all foreseeable Excess Costs.

1018. Second, the Excess Cost must have arisen as a consequence of factors outside CB&I's control, such as:

- events which were unforeseeable ["**Unpredictable Events**"] (**3.3.1.**); or
- scope changes (**3.3.2.**), or
- Reficar's own fault or lack of diligence ["**Claimant's Responsibility Events**"] (**3.3.3.**).

Burden of proof

1019. Before delving into these issues, the Tribunal must briefly address the burden of proof. Throughout its pleadings, CB&I avers that Reficar, as the claimant, bears the burden of proof regarding any Excess Costs to be borne by CB&I[1078].

1020. The Tribunal concurs. It is a general principle of law, that the burden of proof rests with the party submitting a claim. In Colombian law this universal principle is enshrined in Art. 1757 of the CCC[1079]:

> ""*ARTICULO 1757. PERSONA CON LA CARGA DE LA PRUEBA. Incumbe probar las obligaciones o su extinción al que alega aquéllas o ésta*".

1021. Under this rule, each party is required to prove the facts upon which the legal consequences sought by such party are based.

1022. In the present case, Reficar has already met its burden of proof under Art. 1757 of the CCC: it has proven, at least *prima facie*, its claim that Respondents' breach of their Cost Control Commitments has resulted in Excess Costs of USD 1,937.2 million, and that these Excess Costs must be borne by CB&I.

1023. Respondents now raise certain defenses, arguing that the Excess Costs were not caused by their negligence, but that they were caused by Reficar's conduct or as the result of Unpredictable Events, for which they bear no responsibility. Under Art. 1757 of the CCC, the burden of proving these defenses lies with Respondents.

1024. An additional argument may be made.

1025. Under the Heightened Diligence Obligation [described in Section 3.1.1 *supra*] CB&I undertook to "rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own". The wording of this Obligation is analogous to the standard of care which Colombian law imposes on

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[1077] CB&I excluded certain items from the Representation Forecast, but ultimately acknowledged that they would not have a significant impact on costs. See para. 1001 *supra*.
[1078] See e.g., RPHB, paras. 293, 325, 394.
[1079] Art. 1757 of the CCC; English translation by the Tribunal:
"ARTICLE 1757. THE PERSON WITH THE BURDEN OF PROOF. The burden of proving the obligations or their extinction lies with the party alleging such obligations or extinction".

the mandatary in the contract of mandate (*contrato de mandato*)[1080]. Under the CCC a mandatary incurs responsibility vis-à-vis the mandator, if he fails to perform the measure entrusted to him with the "*diligencia y cuidado que los hombres emplean ordinariamente en sus negocios propios*"[1081]. Similarly, the Reasonable Cost Obligation requires CB&I to carry out the contract diligently, minimizing the costs of the Project.

1026. In these situations, where a contractual debtor is required to act with specific diligence, Art. 1604 of the CCC establishes a special rule as regards the burden of proof[1082]:

> "***ARTICULO 1604. <RESPONSABILIDAD DEL DEUDOR>.***
>
> [...] *La prueba de la diligencia o cuidado incumbe al que ha debido emplearlo; la prueba del caso fortuito al que lo alega*". [Emphasis added]

1027. Under Art. 1604 CCC, when a person is bound to act diligently, the burden of proving that this threshold has been met, falls upon the shoulders of such person. Thus, negligence is presumed, unless the person who should have used diligence or care proves otherwise. As explained by Prof. Castro de Cifuentes[1083],

> "*Es decir, en principio se presume su culpa, admitiéndose evidentemente la prueba en contrario para desvirtuar tal presunción*".

3.3.1. UNPREDICTABLE EVENTS

1028. As a first defense, CB&I says that certain Excess Costs were, at least in part, caused by Unpredictable Events which occurred after the Cut-Off Date, for which CB&I cannot be made responsible. Since the present EPC Contract is a cost reimbursable agreement, the Excess Costs caused by such Unpredictable Events should constitute Excluded Costs, which Reficar is not authorised to claw-back.

1029. Respondents refer to five types of Unpredictable Events, which allegedly comply with this requirement. The Tribunal will analyse them in turn.

A. Extreme weather events

1030. CBI invokes extreme weather events in the years 2010, 2011 and 2012 both in Cartagena and in Island Park (where modularization was performed)[1084] (**i.**);

[1080] Titulo XXVIII "DEL MANDATO"; Arts. 2142 to 2199 of the CCC.
[1081] Art. 2155 in relation to Art. 63 CCC, emphasis added.
[1082] CL-709; English translation:
"ARTICLE 1604. DEBTOR'S LIABILITY.
[...] The burden of proof of diligence or care lies with the party who should have used it; proving an Act of God is the burden of the party who alleges it.
All of which, however, is without prejudice to the special provisions of the laws, and to the express provisions of the parties".
[1083] CL-711, p. 8 (source p. 179); English translation:
"In other words, their fault is presumed in principle, obviously admitting evidence to the contrary to disprove the presumption".
[1084] ESOD, paras. 739-746

additionally, CB&I says that Reficar provided faulty information, which made it impossible for CB&I to properly prepare for these events (**ii.**)[1085].

1031. (i) CB&I acknowledges that from August 2010 through late 2011 (*i.e.*, before the Cut-Off Date) there was very heavy rainfall in Cartagena[1086].

1032. The Tribunal finds that, by the Cut-Off Date, CB&I must have been aware of the inclement weather conditions on the site, and consequently, when CB&I issued its +/-5% Class I Representation Forecast, the impact of the inclement weather must have been taken into consideration.

1033. That said, in mid-2012 (after the Cut-Off Date) there was again a spell of heavy rainfall, and to set-off the Excess Cost caused, CB&I submitted a Change Order for a total value of USD 23 million[1087] (albeit a year and a half later, on January 23, 2014). Although inclement weather was the norm in Cartagena, the Tribunal is willing to give credit to CB&I for this amount, because the meteorology in 2012 seems to have been worse than what CB&I could expect from its experience.

1034. (ii) With respect to the allegedly faulty rely-upon information regarding water drainage, this issue was discovered by CB&I in 2010, well before the Cut-Off Date[1088]. Hence, this issue cannot qualify as contributing to an Unpredictable Event.

B. Underground obstructions and contamination

1035. CB&I argues that its work was impacted by the discovery of underground obstructions and contamination, for which Reficar was responsible under the EPC Contract[1089].

1036. Reficar acknowledges its responsibility for some of the underground obstructions and soil contamination, which were discovered prior to the Cut-Off Date[1090], worth USD 4 million[1091], but it denies responsibility for others[1092]; regardless of who was

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[1085] ESOD, paras. 747-749.
[1086] ESOD, paras. 740-745.
[1087] Ex. R-1079, pp. 1-7, 15-16.
[1088] Ex. R-1077.
[1089] ESOD, para. 729, citing to TC 1.1, TC 20.12 and JX-6, Appendix II (Owner Responsibilities), at 5.
[1090] JX-245, p. 2. The supporting documents include a letter from Reficar from September 29, 2011. Additionally, CB&I has presented another letter from Reficar on the same subject, dated 29 December 2011, Ex. R-1516.
[1091] JX-245, p. 1.
[1092] Reficar accepted COs 112, 279, 222 and 238, Ex. B-038;
Reficar did not accept:
Change Order 131 for USD 0.9 million – this concerned existing underground conduit interferences first filed under WNOC 394 in November 2011;
Change Order 169 for USD 30 k – this Change Order specifies that the impact occurred between November and December 2011;
Change Order 208 for USD 140 k – the impacts appear to precede the Cut-Off Date, as the underlying WNOC 436 states that "This Change is reflected in the January, 2012 Forecast".
Total = 0.9+0.03+0.14= 1.07 million
Reficar also did not accept:
Change Order 132 for USD 6.9 million – this concerned the same reasons as the accepted CO 275 and should thus be disregarded.

ultimately responsible, these obstructions and contamination were discovered prior to the Cut-Off Date and thus cannot lead to Excluded Costs.

1037. There are, however, two instances of discoveries of obstructions after the Cut-Off Date, which caused USD 0.1 million in Excess Costs[1093]. The Tribunal has looked into the record and thinks that Reficar withheld approval for these Change Orders arbitrarily[1094]. Thus, USD 0.1 million constitute Excluded Costs.

C. Accidents

1038. CB&I lists an additional set of events involving fires and gas leaks, which the Tribunal accepts as Unpredictable Events that happened after the Cut-Off Date:

- The explosion at the FCC unit on August 30, 2013, quantified by CB&I at USD 4.3 million[1095];

- More fires, all of which occurred past the Cut-Off Date, with a total value of an additional USD 0.4 million[1096].

1039. The Tribunal will credit CB&I these USD 4.7 million, in total[1097].

1040. There are two additional events - the toppling of a crane[1098] and the bursting of a water tank[1099] – which the Tribunal also finds are Unpredictable Events. Both occurred after the Cut-Off Date and Reficar, in fact, accepted all related costs in the

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[1093] Change Order 314 for USD 60 k – this Change Order appears to have arisen from a discovery of the need to change route location for the Heavy Crane, which only occurred in 2014.
Change Order 254 for USD 70 k – this Change Order is for the re-routing, relocation of existing stormwater line and manhole in design area 21; it appears to originate at a time after the Cut-Off Date; the underlying WNOC states that "The cost of this additional work is not included in the January 2012 Project Cost Forecast".
Total = 0.06+0.07=0.13 million.

[1094] Reficar only refused to approve Change Order 254 because it took issue with the added fee, but not with the principal amounts due; however, it rejected payment in total, see Ex. R-1849_14221, p. 4.
Reficar should have accepted Change Order 314 as it was connected with the reverberations of Reficar's decisions regarding the Large Crane, as discussed in the Section VII.2.1.3.3.3.B on Construction, *infra*.

[1095] See Reply, para. 738, confirming that the Change Order for that amount was rejected by Reficar and that Reficar's expert, Long International, credited this amount to CB&I in its damages model. See Ex. C-1731 for the underlying WNOC.

[1096] Fires – USD 0.38 million, based on events in April 2013, rejected by Reficar, see Ex. R-1085; thus Excluded Cost.
Gas Leaks –USD 29 k, based on events in June and October 2012, rejected by Reficar, Ex. R-1089; thus Excluded Cost; USD 32k, based on events from October 2013, rejected by Reficar, Ex. R-1091.
Total: 0.38+0.029+0.032=0.441.

[1097] Total of: 4.3+0.4=4.7 million.

[1098] Ex. R-0966 (confirmation of acceptance in Reply, para. 738). This amount will only be added in the subsequent subsection under Approved Change Orders.

[1099] Fire Water pipe break – USD 0.1 million, accepted by Reficar, see Ex. R-1083; thus accounted for under Approved Change Orders;
Fires – USD 0.38 million, based on events in April 2013, rejected by Reficar, see Ex. R-1085; thus Excluded Cost.
Gas Leaks –USD 29 k, based on events in June and October 2012, rejected by Reficar, Ex. R-1089; thus Excluded Cost; USD 32k, based on events from October 2013, rejected by Reficar, Ex. R-1091.
Total: 0.38+0.029+0.032=0.441.

corresponding Change Orders, as will be seen in Section 3.3.2 *infra*. No further credit to Excluded Costs is thus warranted.

D. MECOR deletion

1041. MECOR was another contractor on the Project and was supervised and paid directly by Reficar, without any involvement from CB&I[1100]. Initially, CB&I planned to use MECOR's petcoke conveyor pipe rack and structure for electrical routing, utility piping and as support for a molten sulphur transfer line[1101]. But, as part of a cost-cutting effort, at the end of January 2012 Reficar deleted the coke conveyor from MECOR's scope of work[1102] – and this deletion had an ancillary effect for CB&I: it made the use of the pipe rack as a support for CB&I's lines impossible.

1042. The Tribunal accepts that MECOR's departure was unforeseeable at the Cut-Off Date.

1043. As to its impact on costs, USD 12.6 million are recorded in the evidence[1103]. In fact, it seems that, Reficar initially accepted these additional costs[1104] but for some reasons, the Parties did not reach a final agreement reflected in formal documentation[1105].

1044. This event thus represented an additional cost of USD 12.6 million of Excluded Costs[1106].

E. Refinery target capacity

1045. CB&I brings up the capacity "uncertainty" on the Project, with the target capacity for the Refinery changing from 150,000 barrels per day ["**BPD**"] to 190,000 BPD, back to 150,000 BPD to finally end with 165,000 BPD[1107]. CB&I says that this uncertainty and lack of foreseeability required additional engineering manhours and had severe knock-on effects on the downstream process units, utilities sections and offsite systems on the Project[1108].

[1100] WMC ER, para. 765.
[1101] WMC ER, para. 765.
[1102] Ex. C-0440, p. 1; WMC ER, para. 766.
[1103] Reficar argues that the MECOR change amounted to USD 12 million at CPHB, para. 318. In the Reply at para. 367, it states that the MECOR-related WNOCs amounted to approximately USD 10.7 million. The costs were estimated under WNOC 468 at USD 11.4 million, see Ex. R-0765. In an abundance of caution, the Tribunal also includes the amount of USD 0.4 million under WNOC 477, see Ex. R-0767. Both numbers account for contingency, unlike Reficar's calculations, see Reply, fn. 692 at pdf p. 188. The Tribunal additionally accounts for WNOC 706 for USD 0.8 million invoked by CB&I's expert, WMC, at WMC ER, para. 776, due to further design changes to accommodate for the change in the pipe racks' location. The total is thus USD 11.4+0.4+0.8= 12.6 million. The Tribunal acknowledges the existence of WNOC 441, Rev. 2 for another USD 0.4 million; however, it is not accounted for here to avoid double counting as this WNOC was ultimately agreed by the Parties under CO 101, see Ex. B-038 and WMC ER, para. 779.
[1104] Ex. R-0764.
[1105] In fact, the WNOC log under Ex. C-0224, points out that for WNOC 468 for "Removal of MECOR Petcoke Pipe Conveyor", the column for Reficar Review Status states "Rejected CO". The same "Rejected CO" text may be found under the columns "NOC Status" and "CO Status".
[1106] Since this value arose from a lack of an approved Change Order, it is already included in the analysis under Subsection [a].
[1107] RPHB, para. 312, citing to WMC ER, Section 6.2.
[1108] WMC ER, paras. 373-375.

1046. CB&I's arguments on fluctuating Project capacity have no bearing on the adjustments to the Representation Forecast, because the capacity was finally fixed at 165,000 BPD in December 2010[1109], a year prior to the Cut-Off Date. Thus, any foreseeable costs on this account were or should have been reflected in the Representation Forecast.

F. Conclusion

1047. In sum, the Tribunal recognizes USD 40.4 million[1110] as Excluded Costs due to the result of Unpredictable Events.

3.3.2. SCOPE CHANGES

1048. Respondents have drawn the Tribunal's attention to the fact that the scope of the works changed during the performance of the Project, thus leading to higher costs, which should be excluded.

1049. Indeed, under TC 62 "Changes" either the Owner or the Contractor can initiate a process to increase or reduce the scope of work[1111]. And these scope changes, as per Section III, Appendix 2 of the EPC Contract[1112], would be included as Owner's costs.

1050. There is, thus, no doubt that additional costs arising out of scope changes should be borne by Reficar, but the really relevant issue here is whether scope changes occurred after the Cut-Off Date; the Tribunal will conclude that, for the largest part, scope changes pre-dated the Cut-Off Date and cannot, thus, be Excluded Costs (**A.**). The Tribunal will then analyse post Cut-Off Date scope changes and arrive at a figure of Excluded Costs (**B.**).

A. Pre Cut-Off Date

1051. CB&I refers to seven areas of work affected by scope changes, which should account of USD 1.478 million cost overruns. The Tribunal will analyse them and come to the conclusion that most of those scope changes happened before the Cut-Off Date:

a. Synergy changes

1052. The Synergy Changes were Reficar-requested design changes with the goal to increase the synergy between the Cartagena Refinery and another refinery owned

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[1109] WMC ER, para. 372; see also Figure 6.1 at pdf p. 152.
[1110] Total of: USD 23 million for inclement weather, USD 0.1 million for underground obstructions and contamination, the total of USD 4.7 million for unsafe and dangerous conditions and USD 12.6 million for MECOR deletion.
[1111] TC 62 – Changes, JX-002, pp. 241-243; JX-004, pp. 218-219.
[1112] JX-006, p. 587:
"5. Owners [sic] Costs
Listed below are some specific items that should be included as Owner's Costs for the overall project expenditure.
- Scope Changes"

by Ecopetrol; the main goal was to increase the production of propylene but the knock-on effects impacted a variety of Project units[1113].

1053. The Tribunal finds that the impacts of the Synergy Changes had been quantified and accepted in the 2010 and 2011 BRNs for a total value of USD 225 million[1114] and no additional increase has arisen after the Cut-Off Date.

b. Flare system

1054. The flare system is an emergency mechanism which collects and burns hydrocarbon materials whenever there is a danger of explosion in a refinery[1115]. CB&I says Reficar changed the design multiple times between January 2009 and November 2014[1116] and requested CB&I to perform related risk analyses[1117].

1055. The flare system was still in flux as of December 2011, when CB&I submitted a cost approval for a study on potential disastrous situations and their mitigation by the flare system[1118] – but this was still within the Cut-Off Date. There is reference to a later (minor) scope changes in an amount of USD 3.6 million[1119], which will be taken into consideration in the next section dealing with post Cut-Off Date scope changes.

c. Recycled alkylation unit

1056. Reficar bought an alkylation unit from another failed refinery project at a discount and asked CB&I to use it in replacement for a unit it had initially planned to build from scratch[1120]; but Reficar was late in transferring necessary design information to CB&I[1121] and extensive engineering work was necessary to adapt the unit to the Project[1122].

1057. The impacts of the purchase were captured mostly in 2010, with the exception of a purchase of new pumps for USD 0.5 million[1123], which will be taken into consideration by the Tribunal in the next section dealing with post Cut-Off Date scope changes.

d. Raw and Waste Water Treatment Plant

1058. Similarly, CB&I says that Reficar is responsible for the cost overruns in the engineering for the Raw and Waste Water Treatment Plant – through choosing an unqualified subcontractor despite CB&I's warnings[1124], delaying the provision of

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[1113] ESOD, para. 278. The details of the changes are explained in ESOD, paras. 279-307 and are not disputed by Reficar when it comes to the objective description of their scope.
[1114] Ex. C-0046; Ex. C-0047.
[1115] WMC ER, paras. 797-798.
[1116] ESOD, paras. 400-414.
[1117] ESOD, paras. 410-412.
[1118] Exs. R-2757 and R-0751.
[1119] Ex. R-2759.
[1120] ESOD, paras. 312-314.
[1121] ESOD, paras. 318-321.
[1122] ESOD, paras. 322-329.
[1123] JX-116.
[1124] ESOD, para. 362, citing to Ex. R-0735. The Tribunal notes that this letter does not state that the contractor was not qualified, as claimed by CB&I.

necessary documents[1125] and ultimately reverting to the original execution strategy through reassigning the engineering to CB&I[1126].

1059. The majority of the Waste Water Treatment Plant scope change controversies ended in the fall of 2010[1127]. CB&I's further assertion of Reficar's persistent interference with CB&I's detailed design through mid-2012 is not substantiated by any references[1128] and regardless, CB&I should have already accounted for any further interferences by the Cut-Off Date, given the knowledge of its relationship with Reficar.

e. Tanks and Spheres

1060. The changes to the Tanks and Spheres are one of the scope change invoked by CB&I in its submissions as a source of Project disruptions[1129].

1061. The Tanks and Spheres on the Project changed mostly due to the Synergy Changes, with some reverberations still in 2010[1130]. Likewise, the procurement delays imputed to Reficar by CB&I happened in 2010-2011[1131], with CB&I communicating them in January 2011[1132]. Finally, the allegedly insufficient inspections performed by Reficar occurred up until 2010, with CB&I communicating the need for repairs as early as January 2011[1133]. The majority of the required tank modification scope of work packages were released by October 2011[1134]. All this occurred prior to the Cut-Off Date.

1062. While further inspections kept revealing additional issues through 2014[1135], CB&I acknowledges that Reficar decided to self-perform a significant portion of the repair work rather than assigning it to CB&I[1136]. There is, however, evidence of one scope change affecting one of the subcontractors working on Tanks and Spheres, which amounts to USD 10.3 million[1137], that will be analysed in the post Cut-Off Date section.

f. Other scope changes

1063. There were two additional scope changes on the Project discussed in detail by CB&I: the construction and improvements to the Central Control Building[1138] and

[1125] ESOD, paras. 361-364.
[1126] ESOD, para. 365.
[1127] ESOD, para. 365, citing to Exs. R-0739, R-732.
[1128] Last sentence of ESOD, para. 365.
[1129] ESOD, paras. 341-360.
[1130] ESOD, para. 341.
[1131] ESOD, paras. 342-350.
[1132] Ex. R-0201, p. 2.
[1133] Ex. R-2244.
[1134] ESOD, para. 359, citing to Exs. R-2244, R-2245, R-2716, R-2717, R-2714, R-2715, R-2712, R-2713, R-2710, R-2711. The only remaining modification scope of work package was dated February 7, 2012 – which CB&I could have predicted by the cut-off date; see Ex. R-2709.
[1135] ESOD, para. 358, citing to Ex. R-2679.
[1136] ESOD, para. 359.
[1137] It is dated July 6, 2015, see Change Order 491, Ex. B-038.
[1138] ESOD, paras. 366-384; and the resulting JX-34.

CB&I being tasked with the Gas Facility works[1139]; however, since both occurred past the Cut-Off Date, they will only be addressed in the subsequent section.

* * *

1064. In conclusion, CB&I claims that around USD 1.5 billion cost overruns were caused by scope changes, for which it should not be held responsible and would have to compute as Excluded Costs.

1065. The Tribunal has analysed each area of scope changes and come to the conclusion that most of such scope changes occurred prior to the Cut-Off Date and thus, were or should have been included in the Representation Forecast, and cannot qualify as Excluded Costs.

1066. There is further evidence of this conclusion, to be found in CB&I's Project Director, Mr. Deidehban's testimony at the Hearing, where he acknowledged that, by the time the Representation Forecast was prepared, all the major scope changes on the Project (apart from MECOR deletion) had already been accounted for[1140].

1067. The Tribunal will analyse the evidence regarding post Cut-Off Date scope changes in the next section.

B. Post Cut-Off Date

1068. As mentioned before, the introduction of scope changes was a process which benefited from detailed guidance in the Change Management Plan referenced by the EPC Contract[1141], including the need to maintain an updated change management log[1142]. Scope changes would typically start with a Written Notices of Change detailing the additional work to be performed and corresponding cost ["**WNOC**"][1143] which, after several steps of approvals by Reficar would evolve into a Change Order, which would again require Reficar's approval.

1069. The Tribunal will analyse all specific scope changes mentioned by CB&I – those that were approved by Reficar in a Change Order (**a.**), as well as those that were not (**b.**).

a. Approved Change Orders

1070. After the Cut-Off Date CB&I filed, and Reficar accepted, a number of Change Orders for the additional work performed. CB&I must be given credit for these

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[1139] ESOD, paras. 428-434; and the resulting JX-263; JX-413.
[1140] Tr. 1234:16-1235:15; Tr. 1297:8-13, on the basis of H-9.
[1141] Ex. R-2928; the Change Management Plan is referenced under Annex I Coordination Procedure, see JX-002, p. 292; JX-004, p. 267; Annex 13 Project Execution Plan, see JX-002, p. 653, 662; JX-004, p. 627.
[1142] JX-002, pp. 479-480; JX-004, pp. 454-455.
[1143] (W)NOCs preceded Change Orders in the change management system on the Project. CB&I was entitled to file a potential notice of change, which if approved by Reficar, would later be developed into a (W)NOC, which again, if approved, would be developed into a further specified Change Order. At this point, Reficar was also given the power to either approve or reject the Change Order. Thus, both categories reflect Project changes well. Reficar was also entitled to initiate the change process but in the Project history, it was CB&I that filed the vast majority of WNOCs and Change Orders. See e.g., B&OB ER, Section 6 "Change Management".

accepted Change Orders, as this further work is deemed to have been instructed by Reficar (or otherwise acquiesced by Reficar) and, pursuant to the Contract, it is part of the Owner's cost.

1071. The Tribunal has reviewed the change management log[1144] and has, on the basis of the final cost report submitted by CB&I on the Project[1145], found USD 129.1 million worth Change Orders approved by Reficar after the Cut-Off Date[1146] – the first Change Order issued past this deadline was CO 41, dated January 12, 2012[1147].

1072. Furthermore, there is a number of WNOCs and certain Change Orders, which were submitted by CB&I, as a consequence of further work performed after the Cut-Off Date, where CB&I now claims that Reficar arbitrarily withheld their authorization with the consequence that CB&I should be credited for their amounts and which will be analysed in the following section[1148].

b. <u>Rejected Change Orders and WNOCs</u>

1073. A total of 1004 WNOCs were filed during the Project[1149]: a vast majority, 70%, were accepted by Reficar[1150].

1074. Out of the remaining 30% of the rejected WNOCs, CB&I only discussed in detail a limited number. The Tribunal will analyse them in the forthcoming sections of the Award, and should be considered Excluded Costs in connection with the following WNOCs and Change Orders:

- **Change Order 247** with a value of USD 12.7 million for the adding of the Large Crane to the work scope[1151] – analysed in Section **3.3.3.B** on Construction;

[1144] The Tribunal uses Ex. C-0024 as the basis for its analysis even though LI has proposed a different log with its adjustments. In the Tribunal's view, even if Ex. C-0024 contains minor errors, as claimed by LI, this document is still more objective as a source of information for the changes on the Project than would have been the document modified by LI.
[1145] Ex. C-0056, tab "Contract Value", sum of all Change Orders past January 1, 2012.
[1146] The Tribunal notes that this number includes the Change Orders for the Central Control Building and Gas Facility; see JX-34, JX-263 and JX-413.
[1147] CO 41, Ex. B-038.
[1148] In some cases, Reficar also granted its approval for WNOCs which were never transformed into Change Orders – but this was only the case when both Parties agreed that the scope change did not have any impact on the forecasted costs, as they would be covered by the separate pool of contingency funds – which under the Representation Forecast constituted USD 141.4 million, see Ex. R-1851_057_00017, tab "Project Summary". Hence, the approved WNOCs that were not transformed into Change Orders will not form part of the Tribunal's analysis.
[1149] Ex. C-0224, tab "NOC LOG".
[1150] Based on the green coloured cells; the Tribunal has discounted WNOC 468 for MECOR which in fact ended up with a rejected CO, as found under the previous subsection. There were 699 accepted WNOCs according to the WNOC log.
[1151] WNOC 715, Ex. B-038.

- **Change Order 285**, with a value of USD 9.9 million for equipment to properly manage the storage areas[1152] – analysed in Section **3.3.3.D** on Materials Management; and

- **WNOC 831** for labour disruption-related costs, with an adjusted value of USD 171 million – analysed in Section **3.3.3.F** on Labour Disruptions.

1075. The Tribunal could end its analysis here, focusing only on the WNOCs and Change Orders discussed in detail by the Parties. Nevertheless, the Tribunal is inclined to enter into further analysis, given that, although the rejected WNOCs by Reficar only represent 30% of the total of WNOCs, they still amount to a significant USD 1,150 million[1153].

1076. According to Respondents, CB&I was entitled to costs adjustments arising out of Change Orders; Respondents aver that Reficar rejected WNOCs that reflected the additional costs based on changes to the Project's scope[1154]; nevertheless, neither CB&I nor its expert have gone through the trouble of analysing all the rejected WNOCs individually. To ensure that CB&I's position is not prejudiced, and that all post-Cut-Off Date scope changes are accounted for (as required in the Bottom-Up approach), the Tribunal will look at those rejected WNOCs that meet the threshold of USD 5 million – this will account for 92%[1155] of the totality of rejected WNOCs[1156]. The Tribunal considers this to be representative enough to ensure that CB&I's position is not prejudiced.

1077. In performing this analysis, the Tribunal will grant CB&I credit for a total of USD 118.4 million[1157] as a result of recognizing the following rejected WNOCs and Change Orders as Excluded Costs[1158]:

- **WNOCs 934** (Rev 1 from November 2014)[1159], **1010** (August 2015)[1160] and **963** (January 2015)[1161] for the purchase of materials for Reficar – Reficar rejected these WNOCs because they included the 6.8% fixed fee supplement that CB&I was entitled to whenever it performed extra work; the Tribunal tends to agree with Reficar that the purchase of materials is an ordinary task in the Contract and CB&I should not be entitled to receive a supplement for it; however, rejecting the entire WNOCs for this reason prejudices CB&I as it effectively made the purchase of the underlying materials; for this reason,

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[1152] Change Order 285, Ex. B-038; See ESOC, para. 301: "In all, Reficar provided nearly US$ 10 million for equipment and labour for CB&I to locate and handle the materials and equipment stored in the laydown areas".
[1153] The Tribunal notes that the extensive case record may include partial submissions on other unaddressed WNOCs but the Tribunal's limitations have compelled it to focus on the Parties' written pleadings in the arbitration.
[1154] ESOD, paras. 1238-1246, with examples for individual WNOCs at ESOD, paras. 1247-1249.
[1155] 996.7 million (sum of rejected WNOCs above USD 5 million)/1085.7 million (sum of all rejected WNOCs)= 0.918.
[1156] *Pro memoria*, the Tribunal is only taking into account post-Cut-Off-Date WNOCs in its calculations.
[1157] Total = 93.9+8.7+5.4+0.1+10.3
[1158] This category is different from the preceding one because the Parties have not argued about these Change Orders or WNOCs in detail in their main submissions; although they may be found in the WNOC log, Ex. C-0224.
[1159] WNOC 934, Ex. B-038.
[1160] WNOC 1010, Ex. B-038.
[1161] WNOC 963, Ex. B-038.

the Tribunal considers that the value of these WNOCs minus the fee supplement should be considered Excess Costs: that is, USD 93.9 million for WNOC 934, USD 8.7 million for WNOC 1010 and USD 5.4 million for WNOC 963[1162];

- **WNOC 943** (October 2014)[1163] for the extension of warranties of purchase orders of critical equipment – Reficar rejected this WNOC because its amount was never expended by CB&I: in 2014, Reficar requested that CB&I reach out to the **Vendors** (third-party suppliers for the Project who were not CB&I's subcontractors) to try and extend the warranties for equipment, which were expiring due to Project delays; however, upon receiving the estimates of the costs, Reficar directed CB&I to cease its work, with Reficar employees taking over the process; the Tribunal thus grants CB&I the amount of USD 0.1 million pursuant to the calculation by Reficar's expert, B&OB, for the work CB&I performed in negotiating with the Vendors following Reficar's instructions[1164], but not for the rest of the WNOC, as the money was never expended as Reficar rightfully claims;

- **WNOC 1024** (July 2015) for Change Orders of the modifications made to a contract with a subcontractor working on the Tanks and Spheres[1165] for USD 10.3 million. The analysis of WNOCs provided by Reficar's expert, B&OB does not include this particular WNOC; given that Reficar has raised no specific defense against excluding this amount, the Tribunal is inclined to grant these costs to CB&I as Excluded Costs.

1078. In turn, the Tribunal will not credit CB&I for the following remaining rejected Change Orders and WNOCs with a value exceeding USD 5 million[1166]:

- **Change Orders 360**[1167] and **362**[1168], for a total value of USD 27 million[1169], analysed under Section 3.3.3.B on construction;

- **WNOC 888** for Additional Security Services employed as a result of the labour disruptions, submitted in March 2015 for 5.3 million[1170]; the Tribunal will devote a whole section to the impact on of labour disruptions on Excess Costs and come to the conclusion that they cannot constitute Excluded Costs,

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[1162] These numbers are simply taken from the WNOC sheets, at the level which does not include CB&I's mark-up fee.
[1163] WNOC 943, Ex. B-038.
[1164] B&OB ER, para. 840.
[1165] WNOC 1024, Ex. B-038.
[1166] The analysis only concerns post-Cut-Off Date WNOCs and Change Orders and thus does not extend to the following:
- Change Order 518 on "131 and 143 Changes 28-Feb-10 Budget to March 2011" for USD 16.6 million, which eponymously preceded the Cut-Off Date, see Change Order 518, Ex. B-038; and
- WNOC 357 for "Change Design of Unit 002 Piling from August Cast-in-Place to Helical Piling" as it was submitted in October 2011; see WNOC 357, Ex. B-038.

[1167] Change Order 360, Ex. B-038.
[1168] Change Order 362, Ex. B-038.
[1169] The Tribunal has added the value of Change Order 361 to the calculation as all three pertained to the same factual scenario. A detailed analysis may be found under Section VII.2.1.3.3.3.D on materials management.
[1170] WNOC 888, Rev 1, Ex. B-038.

except for a very limited category of costs – there is, thus, no need to analyse this particular WNOC.

- **WNOC 833**[1171] for "Force Majeure Due to Abnormal Weather Conditions" has been added by the Tribunal under the preceding section 3.3.1.A on extreme weather events and will not be granted here to avoid double-counting; and

- **WNOC 802** for labour disruption-related costs, analysed under Section 3.3.3.F.

C. Conclusion

1079. The Tribunal has looked into the scope changes as a source of cost overruns, for which according to the Contract, Reficar assumed liability. The Tribunal has found evidence that most of the scope changes occurred prior to the Cut-Off Date and thus, cannot be computed as Excluded Costs.

1080. As for those residual costs related to scope changes happening after the Cut-Off Date, the Tribunal has acknowledged USD 129.1 million in accepted Change Orders – these must be considered Excluded Costs. And of the remaining non-accepted WNOCs and Change Orders, after an analysis of those covering 95% of the value, the Tribunal has decided that USD 118.4 million be part of the Excluded Costs;

1081. In sum, USD 247.5 million of scope changes constitute Excluded Costs.

3.3.3. CLAIMANT'S RESPONSIBILITY EVENTS

1082. Respondents submit that some Excess Costs were caused by situations in which Reficar acted with fault or negligence. The situations cover a very wide category of events, and will be analysed by the Tribunal in the succeeding Sections [**A. – H.**].

A. Engineering

1083. CB&I did the engineering of the Project by itself – it was not subcontracted. CB&I had two off-shore engineering centres, apart from having a team on-site, and had hundreds of engineers working on the Project. Payment of invoices for that work flowed directly and entirely to CB&I[1172].

1084. The payment for engineering was based on the billed number of engineering man-hours, of which two types were charged:

- Off-Site engineering, with the hours charged by CB&I's engineers in Houston and Cairo, and

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[1171] WNOC 833, Ex. B-038.

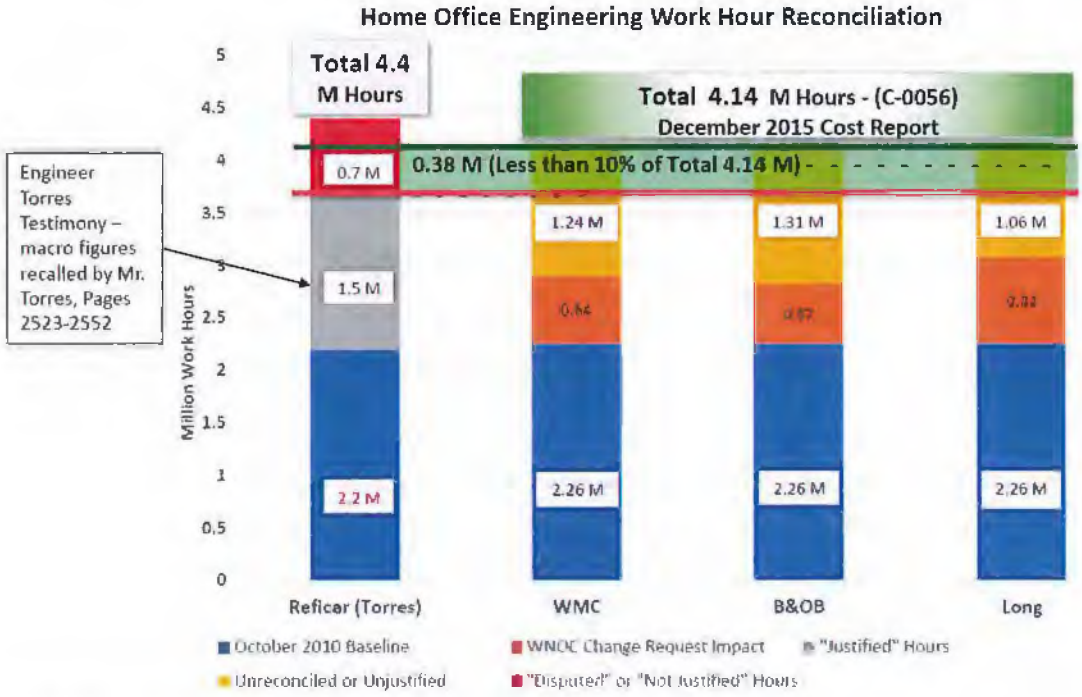
[1172] Tr. 1116:18-24:
"Q. Okay. And payments to CB&I for engineering stayed with CB&I; right?
A. Payments to engineering?
Q. Yeah, payments for engineering.
A. Yeah, yeah, we paid our 24 personnel, that's correct".

- On-Site engineering, performed in Cartagena.

1085. CB&I incurred a total of 4.14 million man-hours in engineering. The experts for both Parties agree that this number can be broken down in three categories:

- the budgeted hours under the October 2010 Baseline (*pro memoria*, this was the first Project schedule under the EPC Contract, see discussion at Section VII.1.1.6 under pre-contractual liability, *supra*);
- additional impacts from the Change Orders and WNOCs, and
- unreconciled or unjustified hours.

1086. Respondents note that the numbers for all three categories put forward by the Parties' experts are very similar; this can be observed in the three columns on the right of the following graph[1173] (the first column will be discussed separately):



1087. The experts agree that unjustified engineering man-hours are in the region of 1.06 million (Long International) to 1.31 million (B&OB); this translated in an increase of the totality of engineering costs from USD 547 million (in the Representation Forecast) to real engineering costs of USD 659 million[1174]; implying an Excess Costs of USD 110 million (20% more).

1088. CB&I claims that it is not to be held responsible for these Excess Costs, for a whole array of reasons – none of which is convincing, in the Tribunal's opinion:

1089. First, once the impact of WNOCs and Change Orders is computed (orange tranche), all three experts agree that the overall engineering productivity achieved by CB&I

[1173] H-027, p. 107.
[1174] Ex. C-0056, tab "Project Sum Cost Report Only", Cell R70.

was around 70% of forecast[1175]. According to CB&I's expert, a factor of 0.7 is a reasonable productivity range under the circumstances CB&I worked under[1176]. Reficar's experts disagree and argue that the factor of 0.7 reflects CB&I's poor engineering productivity[1177].

1090. The Tribunal tends to side with Reficar: an engineering productivity of 1.0 means that the engineers would work at a 100% of their productivity potential. Here, however, they were working at 70% only – it seems reasonable to assume that the productivity decrease is imputable to CB&I itself, who was in charge of its own engineers.

1091. That said, the cost impact of engineering working only at a 0.7 productivity was already known by CB&I at the time the Representation Forecast was presented, and thus, CB&I is deemed to have included this impact in the forecasted USD 547 million engineering costs.

1092. Second, CB&I relies on Eng. Torres' testimony to support that Reficar accepted a higher number of man-hours (1.5 million) as justified hours (grey tranche[1178]): hence, CB&I argues that Reficar itself has admitted that all the allegedly unjustified man-hours should be considered as Excluded Costs[1179].

1093. During the Hearing, Eng. Torres explicitly stated that he was not certain of his recollection[1180]:

> "[…] I don't remember the exact figures but, yes, those would be the numbers".

1094. For this reason, the Tribunal does not award probative value to Eng. Torres's Hearing testimony.

1095. Third, CB&I refers to a number of costs which allegedly arose because of Reficar's own doing. The Tribunal will dismiss this claim, because, even if accepting *arguendo* that they were caused by Reficar, the events leading to the Excess Costs occurred prior to the Cut-Off Date and, thus, were or should have been included in the Representation Forecast:

- Reficar's instruction to proceed with detailed engineering prior to the finalization of basic engineering, which was taken two years before the Cut-Off Date[1181].

[1175] In the case of engineering productivity, the experts reference the relative, and not absolute, productivity factor on the Project. Thus, while the analysis of craft labour PFs benchmarks the Project productivity against that of US Gulf Coast workers, the analysis of engineering PFs uses the forecasted productivity as the target – or 1.0, or 100%, with the actual PFs benchmarked against that, *i.e.*, a PF of 0.7 means 70% of the planned productivity.
[1176] H-027, p. 106.
[1177] B&OB ER, paras. 603-607; LI ER, para. 1187.
[1178] Far left column in the image at para. 1086 *supra*.
[1179] RPHB, para. 303.
[1180] Tr. 2530:22-25.
[1181] RPHB, paras. 313, 319-324; ESOD, paras. 260-307.

- Unsatisfactory hand-over of deliverables by Technip (a contractor which initially worked on the Project FEED together with CB&I), upon Reficar's termination of its contract: it occurred in early 2010[1182].

- Reficar's insistence to use a local Colombian engineering company instead of CB&I's Cairo engineering office[1183], only to change one and a half years later to Cairo, upon realisation of the bad performance of the Colombian engineering company: the contract with the local company was terminated in January 2012[1184], just a month after the Cut-Off Date and four months before the Representation Letter – hence, the cost impact of having used the Colombian sub-contractor must have been properly reflected in the Representation Forecast.

- Multiple revisions to the engineering drawings[1185]: these must have occurred mainly before the Cut-Off Date because at that time the engineering was well advanced.

1096. Fourth, CB&I brings two additional arguments, which do not support the position it tries to defend:

1097. (i) CB&I says that Reficar's team was continuously involved in CB&I's engineering offices, but never complained that CB&I acted with gross negligence in the engineering activity – as Mr. Houtz, Reficar's chief engineer, acknowledged. Reficar would now be estopped from clawing back engineering Excess Costs[1186].

1098. The Tribunal disagrees:

- there is no support for the proposition that an alleged failure to complain in time amounts to a waiver of the right to claw back Excess Costs, moreover, to the contrary,

- there is ample contemporaneous evidence of Reficar filing complaints regarding CB&I's engineering work[1187].

1099. (ii) CB&I says that Reficar[1188] and Ecopetrol representatives[1189] have flaunted the Refinery as a major success story.

1100. The Tribunal remains unconvinced:

[1182] ESOD, paras. 308-311.
[1183] ESOD, para. 338.
[1184] ESOD, para. 340, citing to Ex. R-0709.
[1185] RPHB, para. 305; ESOD, paras. 256-259, 458-460.
[1186] RPHB, paras. 298-301.
[1187] See e.g. delays in issuing piping isometrics (Ex. C-0169, p. 3), the high revision rate of drawings (Ex. C-0104, p. 6), CB&I releasing engineering drawings prematurely (Ex. C-104, p. 10) and delays in engineering progress (Gilchrist CWS, para. 31; Ex. C-0794, Ex. C-0795; Ex. C-0172).
[1188] RPHB, para. 294, citing to Mr. Arenas, Ex. R-2642, pdf pp. 64-65; Mr. Houtz Hearing testimony at Tr. 1528:13-21.
[1189] RPHB, para. 294, citing to Mr. Bayón, Ecopetrol CEO, Ex. R- -1798, pdf p. 7; Ecopetrol BofD MoM, Ex. R-0449, p. 13.

- the task of the Tribunal is not to pass judgment on the quality of the Refinery construction, but to decide whether its construction involved Excess Costs for which CB&I should be held responsible; and

- the praise invoked by CB&I must be read in context: Mr. Arenas was testifying to the *Procuradoría,* with his personal liability at stake; and Mr. Houtz did say at the Hearing that he was proud of the Project configuration, and that the margin the Refinery produces is impressive, but he immediately added "[b]ut I view the project as a failure"[1190].

1101. Fifth, CB&I argues that Reficar's 2012 decision to demobilize CB&I's Houston engineering Home Office and to move CB&I's engineers on-site led to additional inefficiencies, which translated in engineering cost overruns[1191].

1102. The Tribunal notes that Reficar's decision was taken in December 2012[1192], upon CB&I's assurance that engineering was "essentially complete"[1193]. But the record shows that, even after that point, CB&I kept charging Reficar engineering man-hours, including for Home Office[1194].

1103. The Tribunal has already established that one of the consequences of the introduction of the Cost Control Commitments is that certain fiduciary duties arise on CB&I's side. And that Reficar is entitled to rely and place special value on CB&I's representations regarding costs.

1104. This is one of such situations: CB&I made a representation that engineering work was essentially complete and Reficar was entitled to act accordingly and assume that little cost could arise from an almost finished activity; hence, if additional costs arose, it is for CB&I to accept responsibility.

1105. In light of the above, the Tribunal concludes that none of the engineering-related cost overruns should be considered Excluded Costs.

B. Construction

1106. Construction was the major component of the EPC Contract. It is the area with the highest cost overruns – the final cost was USD 3.126 billion[1195], while the Representation Forecast only foresaw construction costs of USD 1.406 billion[1196]. This means that construction experienced Excess Costs of USD 1.720 billion – 120% of CB&I's +/-5% accuracy Representation Forecast!

1107. Construction – in a wider sense – encompasses a number of specific Excess Cost sources, such as modularisation, materials management, craft labour productivity and labour disruptions, which will be looked into separately [**C.** – **F.**]. In this section, the Tribunal will only analyse CB&I's general position that all construction

[1190] Tr. 1528:2-21.
[1191] ESOD, paras. 450-457.
[1192] Davison RWS, para. 161, citing to Ex. R-0799, p. 3.
[1193] Ex. C-0162, p .1.
[1194] Comparison of Ex. R-1855_080, p. 41 and Ex. R-1855_133, p. 99.
[1195] Ex. C-0056, tab "Project Summ Cost Report Only", tab "Construction Services".
[1196] Ex. R-1851_057_00017, tab "Project Summary".

Excess Costs were in fact Excluded Costs, for which it should assume no responsibility.

a. Control over workforce levels

1108. CB&I argues that it cannot be held responsible for any cost overruns arising from the suboptimal allocation and management of workforce on the Project, since it was Reficar who controlled whom CB&I could hire[1197]. Respondents add that Reficar continuously delayed or denied CB&I's formal requests to hire additional craft workers without legitimate cause[1198]. This led to slower than expected construction progress.

1109. The Tribunal disagrees with CB&I.

1110. TC 44.1.3(iii) regulates the hiring of craft workers[1199]:

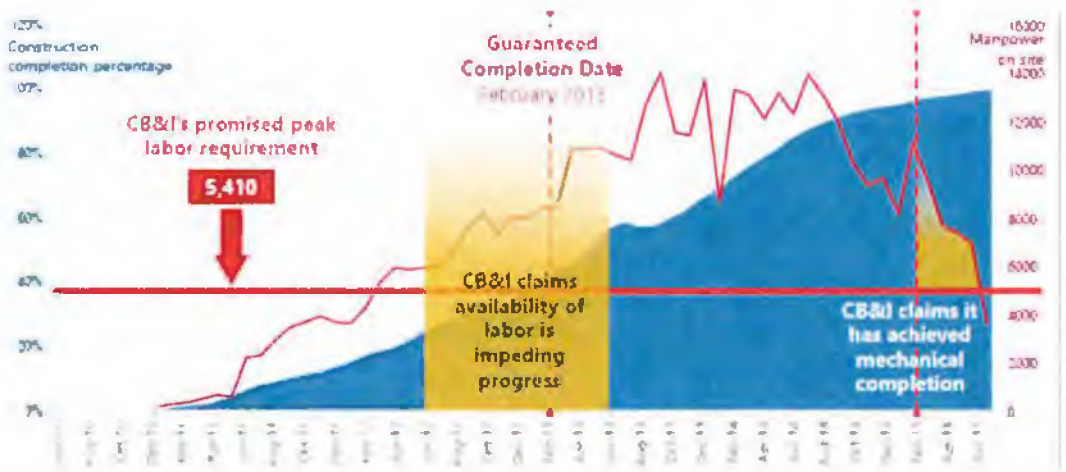
> "If during the course of the Work the Contractor determines that the number of craftsmen or other workers available is insufficient to perform the Work in accordance with the terms of this Agreement, then the Contractor shall, with the prior written approval of the Owner, perform any actions required to obtain additional craftsmen and other workers".

1111. The contractual rule is straightforward: the Contractor must establish the number of craftsmen which, in its professional opinion, are required to carry out the construction in accordance with the EPC Contract, and if at any time the workforce proves to be insufficient, the Contractor is obliged to find and employ additional craftsmen, subject to the prior written approval of the Owner.

1112. The requirement that Reficar approve the additional cost is logical, because this being a cost reimbursement structure, Reficar was legitimately entitled to limit hires to the numbers necessary for the works to be performed; otherwise, the Contractor might over-hire construction workers and recklessly charge the cost overruns to the Owner. On the other side, good faith requires that Reficar not withhold the authorization, when the Contractor reasonably requested an increase.

1113. The following graph shows the actual number of craftsmen employed in the construction of the Refinery[1200]:

[1197] RPHB, para. 404.
[1198] RPHB, paras. 409-412.
[1199] JX-002, p. 216, JX-004, pp. 194-195.
[1200] Unnumbered graph at the end of para. 326 of CPHB; Column AE from Ex. H-013.



1114. The original execution plan foresaw a peak labour requirement of 5,410 craftsmen[1201]. In fact, between February 2012 and June 2015 the actual number of craftsmen employed was consistently above this estimate, reaching its highest number of 14,000 in August 2013 and 2014 – this almost triples the estimated peak labour requirement. *Res ipsa loquitur*: the facts prove that Reficar indulged the tripling of the work force; this runs at odds with CB&I's suggestions that Reficar unjustifiably restricted the number of necessary work force.

1115. CB&I's arguments as to allegedly insufficient workforce are also refuted by a contemporaneous report by Reficar's consultant, Bechtel, who in August 2013 opined that hiring more personnel "does not help; it compounds the problem" because the infrastructure is not designed to handle large influxes in the workforce[1202].

1116. CB&I's arguments, rather than supporting Reficar's responsibility for the Excess Costs caused due to an insufficient workforce, tend to prove the opposite: that CB&I's inefficiencies led to the hiring of huge, unmanageable workforce, which in turn led to Excess Costs in breach of the Cost Control Commitments.

b. <u>Interferences with CB&I Staff</u>

1117. According to CB&I, Reficar also negatively interfered in the hiring of CB&I's own personnel, mainly the Construction Management Team ["**CMT**"][1203].

1118. The Tribunal once again disagrees with CB&I.

[1201] Bechtel confirmed that this capacity was at the 5000-6000 worker level, see Ex. C-0281, pp. 30-31.
[1202] Ex. C-0281, p. 31: "The original execution plans and schedules showed peak direct manpower at the 5,000 - 6,000 worker level. When projects get in trouble and statt dramatically increasing manpower, we usually see weaknesses and failures in the ability of the infrastructure to support the higher work force. Bussing, parking, construction equipment, tools, consumables, scaffold, sanitation, are all impacted".
[1203] Under ESOD, para. 693, CB&I defines Project staff as:
"(1) home office staff, including Engineering, Procurement Services, Project Controls, Project Management, and other support personnel; and
(2) field/site staff working at the site, including expatriates, local workers, and other country nationals ("OCNs"), but excluding craft labor staff".

1119. As with craft workers, Reficar was also entitled under the EPC Contract to accept or reject additional hires for CB&I's own staff[1204]:

> 44.11 The Owner shall approve the Contractor's organizational chart, all positions therein and the staff that will provide professional services.

1120. CB&I argues that Reficar abused this prerogative and arbitrarily delayed, and sometimes withheld, approval for CB&I's additional staff hires: for example, in 2012 Reficar refused to approve 24 out of 45 allegedly urgent applications[1205].

1121. Reficar has provided ample reasons for these refusals[1206], including missing requested information and submission for hire of candidates with no relevant work experience; hence, the evidence does not point to Reficar acting arbitrarily.

c. Control over Other Country National hires

1122. Another staffing issue refers to the availability of skilled local workers: according to CB&I, the local pool was severely limited, with the consequence that the Project was experiencing inefficiencies in construction[1207]. CB&I undertook best efforts to train local workers[1208], but this could not replace experienced craft[1209]; a preferred solution to this issue would have been hiring Other Country Nationals ["**OCNs**"] with sufficient qualifications[1210].

1123. CB&I says that Reficar reduced the cap for OCN hires to merely 3-5%[1211], even though Colombian law placed the limit at 10%[1212] – this resulted in Excess Costs due to low efficiency of the poorly qualified workers.

1124. The Tribunal again is unconvinced for a number of reasons:

1125. First, the need to engage local craft labour was an issue anticipated by the Parties long before the Contract was executed; in fact, CB&I's representations as to its experience and access to pools of skilled local labour were one of the key reasons why CB&I was granted the EPC Contract:

- back in 2007, CB&I represented that it would "maximize use of CBI direct hire construction force to maintain productivity"[1213];
- also in 2007, CB&I made another representation about its experience with local labour[1214]:

[1204] TC 44.11; JX-002, p. 219; JX-004, p. 196.
[1205] ESOD, paras. 695-696.
[1206] Reply, paras. 681-682, citing to Exs. R-1001, C-1681-C-1683.
[1207] ESOD, paras. 699-700.
[1208] RPHB, para. 412, citing to Ex. R-3431 and Ex. R-0459, p. 20.
[1209] ESOD, para. 702.
[1210] RPHB, paras. 405-406.
[1211] ESOD, para. 704.
[1212] Molina ER, Section 7 "Proportions of Colombian and foreign workers", citing to Art. 74 of the Comprehensive Labour Code. Professor Molina then explains that this requirement was repealed in 2010; Hillier ER, Section B, para. B3.4.2.
[1213] Ex. C-0025, p. 1.
[1214] Ex. R-0477, p. 2.

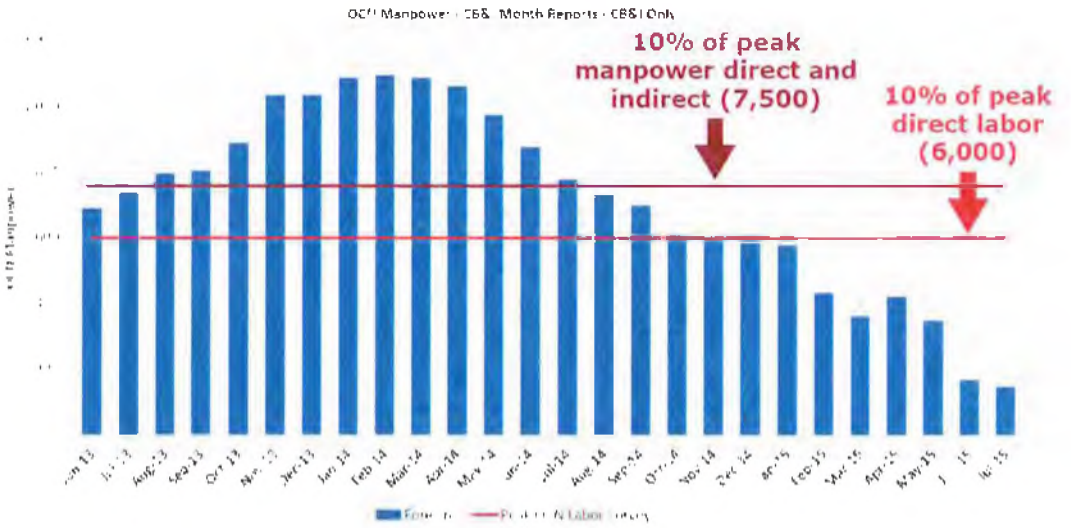
> "CB&I is uniquely qualified to execute the expansion on an LSTK basis. We have relevant engineering experience on all the key process units, capability to perform the modular fabrication in house and experience with direct-hire construction in Colombia. We are one of the few (if any) companies that could adequately quantify and manage the risk and whose principal business model is lump sum turnkey contracting" [Emphasis added].

- in 2008 CB&I reiterated its position about it having more than sufficient direct hire capabilities[1215].

1126. In 2011, half a year into the EPC Contract, CB&I yet again reassured Reficar, this time in the Construction Execution Plan, that it had conducted surveys and confirmed the adequacy of the local workforce, thus ensuring Reficar that any craft availability issue was under control[1216].

1127. Because CB&I made these representations, there should be no causal link between the hiring of local forces and supposed inefficiencies.

1128. Second, the record shows that, during the periods of more intense construction work (mid July 2013 through January 2015[1217]) the OCN workforce was within the 10% limit established by Colombian law[1218], and that the numbers only decreased to the 3-5% level claimed by CB&I for the last half year of work – presumably because the type of work did not require the presence of high skilled OCN:



[1215] Ex. C-0071, p. 20.
[1216] Ex. C-0245, p. 5.
[1217] The Tribunal notes that CB&I makes arguments about the period between May 2011 and March 2012 (see ESOD, para. 704, citing to Exs. R-2795-R-2797, Ex. R-909), but these occurred as construction work was only beginning and the relevant period is reflected in the Tribunal's analysis.
[1218] Ex. H-030, p. 22.

1129. In fact, contrary to CB&I's position, in the crucial month of August 2013, *i.e.*, at the peak hire time, a consultant discouraged Reficar from hiring further OCNs precisely because CB&I was driving up costs with its excessive OCN hires[1219]:

> "The CB&I non manual staff, especially Western expats, appears much larger than expected with less reliance on local or Third Country Nationals (TCN) and Field Non Manuals (FNM) than expected, driving up potential cost".

1130. In sum, any Excess Costs caused by an alleged shortage of OCNs were neither unpredictable nor attributable to Reficar; hence, none of them are Excluded Costs.

d. Site access

1131. Respondents argue that Reficar and Ecopetrol interfered with CB&I's construction activities by creating impediments to workers' access to the construction site[1220].

1132. CB&I offers anecdotal examples of when its employees could not obtain access to the work site due to:

- Ecopetrol equipment blocking physical access to the work site[1221];
- inability to obtain or delay in obtaining the necessary permits issued by Reficar or Ecopetrol[1222], and
- the same access permits being withheld by the labor union leaders[1223].

1133. The Tribunal observes that the majority of the communications cited by CB&I about site access predate the Cut-Off Date[1224]; consequently, the idiosyncrasies of the access requirements to enter the Cartagena Refinery must have been taken into consideration when CB&I issued its Class I Representation Forecast; and thus, cannot be considered Excluded Costs.

e. Scaffolding

1134. Scaffolding forms a crucial part of all construction works and, because the work site comprised many areas that were frequently congested, scaffolding was particularly important on the Cartagena Project[1225]. Scaffolding for the Project was supposed to be rented out by granting a subcontract on a total estimated price basis, which included the costs of rental and labour for installing and removing scaffolding; but some of the scaffolding was handled directly by CB&I[1226].

[1219] Ex. C-0281, p. 6.
[1220] ESOD, paras. 756-762.
[1221] ESOD, para. 757, citing to Ex. R-1092.
[1222] ESOD, paras. 758-760.
[1223] ESOD; paras. 762.
[1224] Ex. R-2393, Ex. R-2386, Ex. R-2381.
[1225] ESOD, para. 765.
[1226] ESOD, para. 767, citing to Ex. R-1095, pp. 2-4.

1135. The Representation Forecast foresaw a total cost for scaffolding of USD 46.8 million[1227] (up from an original budget of USD 23.9 million), while the final costs reached USD 162.8 million, a 247% increase[1228]. The number of scaffolding hours also multiplied: from an original budget of 2 million man-hours to 8.8 million at the end of the Project[1229].

The Parties' positions

1136. CB&I accepts that the cost and man-hours of scaffolding multiplied, but says that these increases were caused by Reficar's faults and negligence[1230].

1137. Reficar sees things differently; it says that CB&I's failures are to blame:

- CB&I would erect scaffolding in anticipation of future work, and thus continue incurring wasteful costs for rental[1231], or would install scaffolding with disregard for newly installed fireproofing and other installations[1232].

- Finally, when CB&I demobilized, it left scaffolding in disarray and Reficar needed to pay its own subcontractors to remove the scaffolding rented out by CB&I[1233].

The Tribunal's analysis

1138. The Tribunal will now analyse and reject CB&I's individual arguments allegedly showing Reficar's fault and negligence. According to CB&I:

1139. First, Reficar incurred multiple delays in approving additional scaffolding, despite its clear necessity for the works[1234]; for example, in mid-2012, this delay was as long as over two months for scaffolding for the FCC Unit[1235].

1140. In fact, the delay in approving additional scaffolding for the FCC Unit was limited to only three weeks, in accordance with a contemporaneous letter from CB&I[1236]. Reficar avers that this three-week delay is not overly significant and was justifiable because by mid-2012, CB&I had already built a reputation for trying to incur extravagant costs which triggered the need to perform detailed reviews whenever CB&I requested additional resources. Reficar's position is understandable.

1141. Second, according to CB&I, Ecopetrol (which was in control of the existent Refinery in the brownfield) gave CB&I a directive to immediately dismantle

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[1227] See Ex. R-1851_057_00017, tab "Construction"; sum of scaffolding categories under "Proratable" – USD 28.9 million + "Scaffolding Rental" under "Site Construction Equipment" – USD 16.2 million + "Scaffolding and ladders for FCC" – USD 1.7 million; total = 46.8 million.
[1228] ESOC, para. 358, citing to Ex. C-0294 compiled from Ex. C-0056.
[1229] Unnumbered graph from ESOC, top of pdf p. 218, based on Ex. C-0261, p. 106 and Ex. C-0155, p. 98.
[1230] ESOD, paras. 562, 765-773, 885, 888.
[1231] ESOC, para. 355, citing to Suarez CWS, paras. 216-217; Houtz CWS, paras. 256-258; LI ER, paras. 185, 191, 365, 707.
[1232] ESOC, para. 356.
[1233] ESOC, para. 357, citing to Suarez CWS, para. 212; Ex. C-0660; Ex. C-0661.
[1234] ESOD, paras. 562, 771.
[1235] ESOD, para. 769, citing to Ex. R-1106.
[1236] Ex. R-0965, p. 1. "[…] the bids were sent to Reficar on September 4, 2012. […] Finally, on September 25, 2012, CB&I received Reficar's approval for the rental of the scaffolding".

scaffolding after their initial need disappeared, which led to constant dismantling and re-erection of scaffolding[1237].

1142. The Tribunal disagrees. The alleged directive by Ecopetrol is only described in a letter from CB&I to Reficar, dated August 1, 2011, in which CB&I avers that Ecopetrol had given instructions that scaffolding for "each test" be erected and "disassembled immediate after the testing is done"[1238]: there is no proof that the directive applied to other types of scaffolding. In any event, the evidence on which CB&I relies stems from August 2011 and consequently any additional scaffolding costs must have been included in the Representation Forecast.

1143. Third, CB&I argues that Reficar used the scaffolding subcontractor for Reficar's own construction works in the brownfield[1239].

1144. The argument is a *non sequitur*: there is no reason why the use of the scaffolding subcontractor for Reficar's own constructions should lead to any Excess Costs – and CB&I has failed to marshal any evidence to the contrary.

1145. Fourth, CB&I argues that Reficar's chosen local Vendor for ladders and platforms failed to deliver on time, making the installation of scaffolding on dressing vessels and towers more costly[1240].

1146. Regardless of whether CB&I's allegations are true, they do not seem to have been the real cause for Excess Costs. CB&I actually acknowledged its responsibility for the additional costs for the scaffolding for dressing vessels and towers[1241]:

> "To mitigate [a vendor]'s delays, CB&I proceeded to set the towers that began to arrive without 'dressing' them with ladders and platforms. Once [the vendor] delivered the missing components, significant amounts of scaffolding were needed to dress already erected towers" [Emphasis added].

1147. Fifth, according to CB&I, Reficar limited scaffolding quantities and reduced the duration of scaffolding resources required by CB&I[1242]. For this allegation, apart from *ex post facto* letters with CB&I's grievances sent to Reficar[1243], CB&I also points to the actual requests it filed for Reficar to approve additional funds required for the subcontractor to cover the required extra materials and work[1244] and an Excel file with a list of pending requests for changes to subcontracts purporting to show the lack of Reficar's approval[1245].

1148. The Tribunal notes that the evidence in support of CB&I's allegation is limited to a relatively small-time window: 2015, the final year of the Project. By that point, Reficar had already expended significantly higher resources on scaffolding than had been forecasted and was fully aware that it needed to rein in CB&I's overspending

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[1237] ESOD, para. 769, citing to Ex. R-1106.
[1238] Ex. R-1106, p. 1.
[1239] ESOD, para. 770, citing to Ex. R-1096.
[1240] ESOD, para. 772.
[1241] ESOD, para. 772.
[1242] ESOD, para. 771.
[1243] Ex. R-1100; Ex. R-1101; Ex. R-0916.
[1244] Ex. R-1102, pp. 2-4.
[1245] Ex. R-1103.

practices. The request for additional funding itself states "[a]ll funds for scaffolding in the current Subcontract Scope of Work cost have been depleted"[1246].

Conclusion

1149. All in all, the Tribunal finds that CB&I's argument, even if found relevant, would only explain a little fraction of the overrun costs. But in this area, the final costs skyrocketed continuously. And there is confirmation in the record, from as early as February 2013, that proves CB&I's knowledge that the scaffolding practices on the Project were "unacceptable"[1247]:

> "With regard to Reficar's observations on scaffolding practices in Unit 101, CB&I agrees that this practice of installing scaffolding with disregard for the newly installed fireproofing and other installations is unacceptable" [Emphasis added].

1150. Summing up, a careful review of the evidence supports Reficar's hypothesis that CB&I was negligently maintaining unused scaffolding on the Project at a high cost, and that this practice resulted in Excess Costs. That said, the Tribunal will take into consideration the prolongation costs incurred in scaffolding in section H. *infra*.

f. Cranes

1151. Over the course of the Project, CB&I entered into 11 crane rental and support services subcontracts[1248]. Reficar's expert, Long International, has quantified an overrun of 175% in the subcontractor category of "Heavy Lift and Construction Equipment", with an increase from the originally budgeted USD 73.8 million to a final cost of USD 202.8 million[1249].

1152. In general, CB&I argues that it complied with good industry practices in its cranes management[1250]. Reficar, replies that CB&I had a very low crane utilization rate[1251] and that the cranes rented out by CB&I were improper models for the works[1252].

1153. Reficar has proffered evidence that between April 2011 and April 2013, CB&I had 140 cranes on site, but only half as many operators[1253]. The Tribunal is convinced that this fact must have generated tremendous costs for the Project, and the Tribunal has already established (see Subsections (**a.** and **b.** *supra*)) that CB&I was the party responsible for ensuring sufficient workers on the Project.

[1246] Ex. R-1102, p. 3.
[1247] Ex. C-0293. The Tribunal notes that the letter ends with a caveat that nothing in it should be considered an admission or waiver; however, if this reservation were to be enforced, then the Tribunal would not be able to scrutinize any letters by either Party, as both were supported by professional lawyers, who ensured the inclusion of such preservation of rights text.
[1248] ESOD, para. 776.
[1249] LI ER, Table 6.15-1 at pdf p. 238; the category contains multiple other services apart from just cranes rental.
[1250] ESOD, para. 775.
[1251] ESOC, paras. 359-360.
[1252] ESOC, paras. 361-362.
[1253] Ex. C-0296, p. 3; Houtz CWS, paras. 259-262.

1154. The finding is reinforced by an audit performed by Foster Wheeler from January to February 2012, which found that CB&I was only using 18% of the cranes it had subcontracted[1254], providing another plausible explanation for the significant Excess Costs in cranes management.

1155. There is a second argument: the Excess Costs of cranes subcontractors had already become an issue as early as April 2011 and Reficar had expressed its concerns about the proper management of cranes[1255]. This alone is sufficient evidence to find against CB&I on this issue.

1156. These general arguments are in themselves sufficient to dismiss CB&I's claim. That said, the Tribunal will enter into a detailed analysis of each event which, allegedly, caused the Excess Costs, to marshal further support for its general conclusion:

(i). Events foreseeable at Cut-Off Date

1157. CB&I blames Reficar for a number of inefficiencies with cranes that led to cost overruns, but which the Tribunal finds were all foreseeable as of the Cut-Off Date:

- CB&I requested design drawings for the heavy haul road to ensure the cranes could use it and Reficar took a long time to deliver these drawings, after repeated requests, in May 2011[1256].
- CB&I avers that it informed Reficar as early as October 2011 about the shortage of qualified crane operators[1257].
- Likewise, Reficar caused disruptions through diverting cranes to support the Owner's work scope; this first occurred in November 2011[1258].

(ii).Later events

1158. The Tribunal will address CB&I's arguments that these Excess Costs, incurred after the Cut-Off Date, were the result of Reficar's negligence[1259]:

1159. First, according to CB&I, Reficar delayed approval to retain additional cranes[1260].

1160. The delay in itself is not indicative of negligence. Here, not only has CB&I failed to prove existence of negligence, but there is evidence that Reficar's delay in taking decisions is justifiable.

1161. CB&I acknowledges that it was its own decision to contract for a large number of cranes in advance to avoid the risk of their later unavailability and allowing for

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[1254] Ex. C-0297, p. 14.
[1255] Ex. C-0295.
[1256] ESOD, para. 779, citing to Ex. R-1114.
[1257] ESOD, para. 786, citing to Ex. R-1017.
[1258] ESOD, para. 783, citing to Ex. R-1122.
[1259] There is one additional argument, regarding the impact of labour unrest (ESOD, para. 785.). Reficar's scope of responsibility for labour issues will be addressed specifically in Section VII.2.1.3.3.3.F *infra*. And also one relating to the payment of subcontractors (ESOD, para. 781, citing to Ex. R-1121), which will be analysed in Section VII.2.1.3.3.3.B.g *infra* dealing with subcontracts.
[1260] ESOD; para. 781, citing to Ex. R-1116; Ex. R-1117; Ex. R-1118; Ex. R-1119 and Ex. R-1120.

"contingency in large capacity crane utilization"[1261]. In other words, CB&I preferred to incur potentially unnecessary costs to mitigate hypothetical future delay.

1162. Thus, the Tribunal finds that it was reasonable for Reficar to have taken its time to determine whether the costs were actually necessary.

1163. Second, Reficar would also be responsible for the cost overruns connected with the TC-36000 ["**Large Crane**"], which required special handling and preparation[1262] and in which Reficar is said to have interfered through delaying the pad installation[1263], failing to remove physical impediments to the Crane's transport[1264] and failing to provide critical information[1265]; in the end, Reficar agreed that the use of the Large Crane amounted to a success[1266].

1164. The Tribunal agrees with CB&I and, in fact, so did Reficar when it approved WNOC 604 for USD 1.3 million[1267]. CB&I submitted another Change Order for the Large Crane in June 2014[1268], which was rejected by Reficar.

1165. Since Reficar acknowledged this responsibility, and has not presented evidence supporting its decision to refuse to approve the subsequent Change Order, the Tribunal finds (as was anticipated under Section 3.3.2.B on post Cut-Off Date scope changes) that the related costs of USD 12.7 million must be considered Excluded Costs.

1166. Third, CB&I submits that Reficar was allegedly responsible for delayed deliveries of equipment from Vendors[1269].

1167. The Tribunal is only partially convinced by this argument. CB&I points to a letter from July 2012, stating that "extended durations of some cranes on site was caused by the unforeseen delays in delivery of equipment and structural steel from Vendors"[1270], with a nearly identical text in a subsequent letter from June 2013[1271]:

> "Additionally, the extended durations of some cranes was caused delays [sic] in delivery of equipment and structural steel from Reficar vendors".

1168. The Tribunal opines that, while there appear to have been delays in delivering equipment from Vendors, these delays could not have been material:

[1261] ESOD, paras. 777-776.
[1262] ESOD, paras. 792-796.
[1263] ESOD, paras. 797-800.
[1264] ESOD, para. 801.
[1265] ESOD, paras. 802-803.
[1266] ESOD, paras. 805-806, citing to Ex. R-2810; Ex. R-2812; Ex. R-1896_00062.
[1267] Ex. C-0224, change title "Work Associated with Set up of HL Deep South Crane TC-36000". The change was accepted by both Parties as a design change (*i.e.*, not additional work) and so no additional costs are considered Excluded Costs.
[1268] Change Order 247, Ex. B-038; The Tribunal notes that there is no risk of double-counting as the Change Order specifically states at p. 2 that this Change Oder includes the full value of WNOC 604.
[1269] ESOD, para. 782, citing to Ex. R-963, Ex. R-964.
[1270] Ex. R-0963, p. 1.
[1271] Ex. R-0964, p. 2.

- It is to be expected that in its communications CB&I should have mentioned the effects of these delays; instead, both letters proffered by CB&I only mention the Vendor delays as a side-note;

- The use of the word "additionally" before explaining this cause, indicates that there were more important delay causes; and

- No WNOC exceeding USD 5 million was filed on this account – as the Tribunal has already pointed out, the approximately 209 post Cut-Off Date rejected WNOCs below USD 5 million had an aggregate value of only USD 89 million; hence, in average their amount was USD 0.4 million.

g. <u>Subcontract management</u>

1169. During the Project, CB&I administered over 270 subcontracts, signed in its own name with third parties that would perform work that was inside of CB&I's own scope under the EPC Contract[1272].

1170. CB&I was the entity who would enter into contracts with the subcontractors and the moneys for the subcontractors' work passed from Reficar, through CB&I, to the subcontractors.

1171. Unlike for Vendors, with whom the contracts were signed either directly by Reficar or by CB&I in Reficar's name, CB&I had a direct contractual relationship with the subcontractors:

> [...] 26.1.5 Subject to TC57, all Lower Tier Subcontracts will be entered into by the Contractor in its own name.

1172. TC 26.1[1273], as confirmed by TC 5.4[1274], specifically made CB&I responsible for the subcontractors' performance and TC 26.4.1 made CB&I explicitly liable for managing the subcontractors[1275].

1173. CB&I's obligations in managing the subcontractors were also further detailed in the Subcontract Plan, with an initial version attached to the EPC Contract[1276], later updated in March 2012[1277]. Pursuant to the task matrix therein, CB&I was engaged in managing the process of subcontractor selection, with a few steps requiring participation from Reficar. One of the tasks for Reficar under the matrix was to review and approve the "Recommendation for Award", the step preceding contract award, for each subcontract[1278]; meaning that in effect, CB&I could never award works to a subcontractor that Reficar would not accept.

[1272] RPHB, para. 422; ESOD, para. 807.
[1273] JX-002, pp. 201-202; JX-004, p. 185.
[1274] JX-002, p. 178; JX-004, pp. 163-164.
[1275] JX-002, p. 204; JX-004, p. 187.
[1276] JX-002, JX-004, Annex 8 – Lower Tier Subcontracts T&C and Plan.
[1277] LI ER, para. 789, citing to Ex. C-0658.
[1278] Ex. C-0658, p. 13.

1174. It is with keeping in mind the obligations above that the Tribunal will analyse CB&I's arguments as to the Excess Costs constituting Excluded Costs in the areas of subcontractors selection (**i.**) and subcontractors administration (**ii.**).

1175. As regards the amounts in question, Reficar's expert identifies the entirety of subcontractor (construction and indirect construction support services) Excess Costs at USD 451.5 million[1279]. CB&I's expert, Mr. Hillier, provides a thorough report on CB&I's management of subcontractors[1280], with detailed appendices containing the history of changes made to the contracts with each major subcontractor[1281]; however, he does not offer any number that he believes would constitute Excess Costs.

(i). Subcontractor selection

1176. CB&I complains that Reficar, misguided by its cost-saving goals, selected local subcontractors that offered the cheapest services but who ultimately ended up underperforming, despite CB&I's recommendations to award these contracts to more expensive but also more reliable bidders[1282].

1177. The Tribunal is not convinced, on the basis of the task matrix of the Subcontract Plan in the EPC Contract[1283]:

Step Requiring Approval	CB&I Subcontracts Admin.	CB&I Subcontracts Manager	CB&I Eng / Construction Manager	CB&I Project Controls Manager	CB&I Legal	CB&I Project Director	Owner
Prequalification of Subcontractor(s)	I	A	R	-	-	R	P/R

1178. The matrix states that CB&I subcontracts administrators would initiate the selection process, CB&I's subcontracts manager would approve the selected subcontractors and CB&I's engineering and construction manager, as well as CB&I's project director, would review the pre-qualification of subcontractors[1284]. Under the task matrix, Reficar's participation in the review of the pre-qualification of subcontractors is incidental, compared to CB&I's.

1179. With this level of engagement from CB&I, and the fact that CB&I would be entering into contracts with the subcontractors, Reficar's participation and review roles must have been limited in scope.

1180. Additionally, according to the Contract, all pre-qualified subcontractors should be equally capable to perform the work, as confirmed by the Subcontract Plan[1285]:

> "All companies that pass each portion of the prequalification assessment will become CB&I-approved subcontractors".

[1279] LI ER, para. 796, based on LI ER, Table 6.15-1 at pdf p. 238.
[1280] Hillier ER, Section G.
[1281] Hillier ER, Attachments G3.3.1-3.3.2 and G.4.4.1-G.4.14.2.
[1282] ESOD, paras. 833-835.
[1283] JX-002, p. 541; JX-004, p. 516.
[1284] Ex. C-0658, p. 13; I = initiate; R = review; A = approve; P = participate.
[1285] Ex. C-0658, p. 8.

1181. The purpose of the procedure was precisely to establish a number of bidders that fulfilled the requirements, and to then award the contract to the lowest qualified bidder[1286]:

> "Subcontract Administrators [...] will carry out CB&I's procedures for: (i) the prequalification of interested subcontractors; (ii) the management of the competitively bid "Invitation to Tender" [...] process; (iii) the negotiation and award of subcontracts to 'best-value' qualified subcontractors that offer the highest technical skill at the lowest price; and (iv) the administration of the subcontracted work" [Emphasis added].

1182. Had CB&I properly performed its vetting duties, then all pre-qualified (technically and commercially)[1287] bidders should have been equally able to perform the work, and Reficar was entitled – amongst those – to award the contract to the lowest bidder.

1183. In fact, the Subcontract Plan gave Reficar approval power precisely to reconcile the conflicting interests between the Owner and the main Contractor, and CB&I has no right to complain about Reficar's reasonable decisions, taken on the basis of data provided by CB&I as a result of its bidder qualification exercises.

1184. CB&I does not contest that its practice was to qualify a number of subcontractors and then to only recommend those at the higher end of the cost range, because they allegedly offered superior services[1288] – in fact, CB&I is therefore admitting that it did not conform with the Cost Control Commitments: if there are multiple bidders fulfilling the requisite criteria, the reasonable selection criterion is price.

1185. The only explanation is that CB&I must have pre-qualified some bidders, knowing that they failed to fully comply with the requirements.

1186. CB&I's complaint about Reficar favouring local bidders is also misguided, given that Contract gives priority to local subcontractors over regional and then national ones, in that order (with no priority for foreign bidders):

> "26.1.10 As far as possible, the Contractor shall, when procuring all Lower Tier Subcontracts, Purchase Offers and contracts, give preference first to local suppliers, secondly to regional suppliers, and lastly to national (Colombian) suppliers"

1187. Thus, CB&I's arguments about any Excess Costs arising from Reficar's allegedly poor selection of subcontractors are rejected.

(ii).Subcontract administration

1188. As regards subcontract administration, CB&I argues that all Excess Costs in this area are Excluded Costs because:

[1286] Ex. C-0658, pp. 3-4.
[1287] CB&I explains its exclusive role in qualifying the bidders at ESOD, para. 815.
[1288] ESOD, paras. 833-835.

1189. First, through its decision to overlap basic and detailed engineering, Reficar caused the need to enter into subcontracts based on a unit rate pricing structure (since the required amounts of materials were unknown due to the unfinished engineering); as a result, the materials and subcontractors' services were severely underestimated – when the engineering was completed, it turned out that many more materials and much more services from subcontractors were required; all those costs were Excluded Costs as they resulted from Reficar's decisions[1289].

1190. The Tribunal disagrees with CB&I on the first point.

1191. By the Cut-Off Date at the end of 2011, CB&I was fully aware of the impacts of Project strategy decisions made two years prior; likewise, engineering should have been sufficiently advanced by that point to properly estimate the required quantities and work.

1192. Second, Reficar retained control in the area of subcontract administration and through the power to approve the scope of work, budget and changes, Reficar made short-term costs-cutting decisions that led to cost overruns[1290].

1193. The Tribunal also disagrees with CB&I on the second point.

1194. The EPC Contract makes CB&I fully responsible for the subcontractors' work.

1195. TC 26.1 not only tasked CB&I with managing the subcontractors but also specifically placed on it the responsibility for the subcontractors' performance[1291]:

> "26.1.2 As part of the Work, the Contractor shall identify, assess, recommend (all in accordance with the Project Procurement Plan attached as Exhibit 7) and manage all Lower Tier Subcontractors, and shall be responsible for their Work and for their proper performance of any and all obligations set out in the Lower Tier Subcontracts (including, without limitation, compliance with applicable free trade zone regulations and obligations, and labour obligations)" [Emphasis added]

1196. TC 26.4.1 confirms that CB&I was responsible for managing the subcontractors[1292]:

> "26.4.1 The Contractor shall act as the Owner's representative in Managing Third Party contractors, Vendors and the Freight Forwarder, and the Owner shall notify such Third Party contractor(s), Vendor(s) and the Freight Forwarder of the Contractor's authorization to Manage them for and on behalf of the Owner. Provided that the Contractor has complied with its obligations to Manage, the Contractor shall have no responsibility for compliance by Third Party contractors, Vendors or the Freight Forwarder with the provisions of such Third Party contracts or Purchase Offers entered into by the Owner".

[1289] ESOD, paras. 811, 825-830.
[1290] ESOD, paras. 810, 822-823, 832, 840-845, 856-857.
[1291] JX-002, pp. 201-202; JX-004, p. 185.
[1292] JX-002, p. 204; JX-004, p. 187.

with the term broad understanding of the obligation of "managing" explained under TC 26.4.3[1293]:

> "26.4.3 For the purposes of this TC26.4, "Managing" shall mean planning, directing, coordinating and actively administering the relevant Person by taking those steps in the Contractor's power which are capable of achieving the desired results under the relevant contract, which a prudent, diligent and reasonable engineering, procurement and construction company, which is properly qualified and competent in performing services of a similar nature, would take with the aim of achieving such results (short of entering into a formal dispute resolution procedure with that Person), and "Manage" and 'Management' shall be construed accordingly. The Owner shall cooperate in a timely manner with the Contractor to enable the Contractor to perform its Management obligations".

1197. TC 5.4 further confirms that CB&I agreed to take full responsibility for the work performed by the subcontractors[1294]:

> "TC 5.4 Contractor's Responsibility for the Work
>
> Subject to the provisions of this Agreement, the Contractor is responsible for the manner in which the Work is performed, and all employees, representatives or Lower Tier Subcontractors are under the control of the Contractor and will not be deemed to be employees of the Owner, and nothing contained in this Agreement or in any Lower Tier Subcontract awarded by the Contractor will be construed as creating any contractual relationship between any such employees, representatives or Lower Tier Subcontractors and the Owner. The engagement by the Contractor of any representative or Lower Tier Subcontractor to undertake any part of the Work shall not relieve or excuse the Contractor from the due and proper performance of those parts of the Work" [Emphasis added].

1198. If CB&I had properly quantified the required work and materials in the Class I Representation Forecast, then any subsequent changes to the subcontracts must have arisen from CB&I's mismanagement of the subcontractors, or their faulty performance, for which CB&I also agreed to take full responsibility; hence, Reficar cannot be held liable for any associated Excess Costs.

1199. In any event, the anecdotal evidence[1295] provided by CB&I regarding alleged interferences by Reficar does not prove causality and does not support a quantification of Excess Costs that the Tribunal could accept as Excluded Costs.

[1293] JX-002, p. 205; JX-004, p. 188.
[1294] JX-002, p. 178; JX-004, pp. 163-164.
[1295] Some examples include the hand excavation of contaminated soil by subcontractors, see ESOD, paras. 839-840 – the impacts of contaminated soil are in fact included in the Tribunal's analysis of unforeseeable events; another such decision was the delayed approval for CB&I's proposed mitigation measure of granting extra work to a post-weld heat treatment subcontractor that was performing well, see ESOD, para. 844; Reficar did grant the approval but only after reasonable scrutiny, given how the other subcontractor for the same discipline pre-qualified by CB&I was underperforming.

1200. But, even if such interferences in the determination of the work scope had been significant, it was Reficar's right to instruct and approve scope changes[1296]:

Step Requiring Approval	CB&I Subcontracts Admin.	CB&I Subcontracts Manager	CB&I Eng / Construction Manager	CB&I Project Controls Manager	CB&I Legal	CB&I Project Director	Owner
Change Orders (Additional Scopes)	I	A	I / A	A	-	A	A

1201. This mechanism is not unusual: Reficar needed to have veto power, to prevent that subcontractors, with CB&I's support, inflate the cost of work. On a cost-reimbursable contract, approval powers for scope changes that lead to additional costs ensure that the main contractor and subcontractors do not collude so as to exploit the owner's funds.

1202. It is thus fully reasonable for Reficar to have refused to grant approval to certain change requests in the subcontractor's scope of work, that would have led to further Excess Costs – in that case, CB&I has to bear the burden of these Excess Costs. In fact, CB&I concedes the point, because at least some Excess Costs incurred by subcontractors were not billed to Reficar[1297].

1203. Third, CB&I argues that Reficar granted the necessary approvals with undue delay[1298].

1204. The Tribunal has already established that by the final years of the Contract, when amendments to the subcontracts became necessary due to the exhaustion of the initially assigned resources, Reficar had already learned of CB&I's nonchalant approach towards Project costs – thus, it was reasonable for it to withhold approval for subcontract changes until it was certain that these changes were warranted.

1205. Fourth, CB&I argues that Reficar directed subcontractors to perform extra work, gave them conflicting orders and rejected CB&I's mitigation plans whenever underperformance of a subcontractor was identified[1299].

1206. The Tribunal is, again, unconvinced.

1207. Nowhere in the Subcontract Plan has the Tribunal found any prohibition of communications between the Owner and the subcontractors.

1208. Reficar was also not obligated to follow CB&I's mitigation plans, especially given how under other circumstances these plans ended up in additional Excess Costs (see findings under Subsections **d.** and **e.** *supra*).

[1296] Ex. C-0658, p. 17.
[1297] RPHB, para. 575, citing to H-23, p. 34, which in turn cites to Ex. R- 2219_D and Ex. R-2220_D, adding to a total of COP 68 billion and USD 20 million that CB&I incurred but never invoiced to Reficar. The amounts in COP included those for costs of subcontractors that CB&I chose not to invoice or that CB&I considered non-reimbursable under the Contract; see *e.g.* category for "SPS" (who was a subcontractor).
[1298] ESOD; para. 837.
[1299] ESOD, paras. 812, 846-852.

1209. Fifth, CB&I argues that Reficar delayed payments or refused to reimburse subcontractors, which led to their lowered productivity[1300].

1210. The Tribunal is also not convinced by CB&I's argument.

1211. As regards the payments of subcontractors' costs, this was entirely CB&I's responsibility, as established by the Subcontract Plan[1301]:

> "1.2 Subcontracts Group Organization
>
> CB&I Project Subcontracts Group personnel are responsible for drafting, evaluating, negotiating, awarding, and administering all subcontracts. They are responsible for all formal communication between CB&I and its subcontractors, verification and approval of invoices for payment, and recording the minutes at meetings that track the progress, completion, and acceptance of the subcontracted work.
>
> [...]
>
> 5.3 Invoicing and payment
>
> All subcontractor invoices for work performed will be forwarded to the Subcontracts Group for verification that the pricing and supporting documentation are in accordance with the subcontract, and that daily field reports, timesheets, and other measurements of progress have been approved by CB&I Construction. Once approved by Subcontracts, the invoice will be sent to project accounting group for payment. If rejected, the invoice will be returned to the subcontractor for revision, and the Subcontracts Administrator will include a written communication describing why the invoice (or portion of the invoice) has not been approved."

1212. None of the above provisions mention Reficar – and for good reason. CB&I was in direct contractual relationships with the subcontractors and the obligation to remunerate subcontractors corresponded to CB&I; if CB&I had issues or difficulties in collecting its own invoices from Reficar, this should not have affected the subcontractors' rights to be paid.

1213. CB&I has proffered evidence through which it means to prove the existence of outstanding payments to subcontractors, and the allegation that the unpaid subcontractors threatened to stop work[1302]. Additionally, CB&I has drawn the Tribunal's attention to letters requesting Reficar to pay pending invoices[1303]. None of this evidence is apposite in its claim that subcontractor-related Excess Costs were Excluded Costs, as, even if proven, CB&I's allegations could not modify the contractual arrangements between the Parties.

1214. Finally, the Tribunal notes that CB&I has presented a multitude of arguments with anecdotal evidence about the alleged responsibility of Reficar for the

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[1300] ESOD, paras. 846-851.
[1301] Ex. C-0658, p. 3.
[1302] Reeves RWS, paras. 105-112.
[1303] Ex. R-0069; Ex. R-0070.

underperformance of subcontractors in the categories of the FCC Unit[1304], pipe insulation and heat tracing[1305], electrical and instrumentation[1306] and testing[1307].

1215. The Tribunal sees no need to address these detailed arguments in sequence, as their general character is already encompassed in the above analysis of Reficar's alleged control over managing subcontractors, Reficar's delayed or declined payments for subcontractors' work and Reficar's decisions made to reduce costs.

1216. In addition to this, the Tribunal notes that the subcontractor on the FCC Unit had finalized almost all of its work by the Cut-Off Date[1308].

1217. In any event, none of CB&I's arguments could overcome the key premise that CB&I, and not Reficar, was fully responsible for the subcontractors' work under the EPC Contract.

h. <u>Rework</u>

1218. Reficar argues that it is entitled to claw back the USD 28.21 million it expended for the rework and corrective work, and the related productivity loss, that resulted from CB&I's errors and omissions in construction[1309].

1219. CB&I denies all responsibility: it followed the required rework procedures[1310], the work on the Project did not give rise to any "major" quality issues[1311], and the rework did not affect the overall worker productivity on the Project[1312]. It also mentions that Reficar's expert's calculations of the monetary impacts of rework are severely flawed[1313].

1220. These arguments are *non-sequitur*: even if CB&I followed the procedures, the scope of rework was limited and there was no impact on overall craft productivity, this does not prove that CB&I would not be responsible for the Excess Costs.

1221. And the point is not whether Reficar inflated the monetary impact of rework: the Tribunal has already established the Excess Costs, applying a Bottom-Up Modified Total Cost Methodology; it is now for CB&I to prove that some of those Excess Costs were caused by factors outside CB&I's control.

1222. On this issue, Mr. Hillier, CB&I's construction expert, opines that the rework was sometimes caused by Reficar, and he points to problems with the storage conditions in the laydown areas, which were Reficar's responsibility (**i.**), or the damage in the refractory equipment, which was also within Reficar's scope of liability (**ii.**). Finally, he also mentions that Vendors could have been to blame for the costs

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[1304] ESOD, paras. 860-872.
[1305] ESOD, paras. 873-890.
[1306] ESOD, paras. 891-911.
[1307] ESOD, paras. 912-923.
[1308] Based on analysis of Mr. Hillier at Attachment G4.4.1.
[1309] CPHB, paras. 352-353; LI ER, paras. 205-210, 594-612.
[1310] Hillier ER, paras. 4.10.5-8, 18-19.
[1311] Hillier ER, paras. 4.10.9-10.
[1312] Hillier ER, paras. 4.10.14-17.
[1313] Hillier ER, paras. 4.10.20-23.

associated with reworks[1314] (**iii.**). And CB&I adds that it has always complied with good industry practices (**iv.**).

1223. The Tribunal finds these arguments are likewise refuted:

(i). Storage conditions

1224. CB&I claims that the storage area (the Laydown Areas discussed under Section VII.2.1.3.3.3.D on Materials Management, *infra*), for which Reficar was responsible, was not weather-proof[1315]; it was prone to flooding[1316] and lacked an area with air-conditioning[1317] – which led to some equipment being damaged and needing rework.

1225. The Tribunal finds that, even if CB&I was right, it must have been aware, when it issued the Representation Forecast as of the Cut-Off Date, that the arrangement of lay down areas in Cartagena was not optimal and would cause additional costs, which must have been included in the USD 3,971 million estimate.

(ii).Refractory materials

1226. Under Section III of the EPC Contract Reficar was responsible for the action titled "Perform dry out of furnace refractory in accordance with the refractory/heater manufacturers requirements" prior to shipping the refractory materials to the work site[1318]. CB&I's materials manager, Mr. Baker, stated at the Hearing that Reficar chose not to perform the dry-out[1319].

1227. In 2012[1320] it became known that refractory materials installed in the furnaces of Units 100, 110 and 111[1321] were damaged, with associated costs amounting to USD 27 million[1322]. CB&I believes that Reficar's failure to perform the dry out caused the damage[1323]. Reficar sees things differently: it argues that the damage was caused by CB&I's failure to properly protect the equipment from moisture or to store it in a proper manner[1324].

1228. The existing evidence supports Reficar's position.

1229. The insurer reviewed the damage suffered by the materials and, in a letter, it rejected Reficar's request for reimbursement, reasoning that the "'shelf life / use by' date suggested by the manufacturer / supplier had expired whilst the materials were stored in the laydown yard"[1325]. In other words: the insurer concluded that the

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[1314] Hillier ER, paras. 4.10.11-12.
[1315] RPHB, para. 381-382.
[1316] RPHB, para. 381, citing to Tr. 3543:24–3544:19.
[1317] RPHB, para. 382, citing to Baker RWS, paras. 126 and 129.
[1318] JX-006, p. 101, point 5.7.26.
[1319] Tr. 3542:17-20.
[1320] Ex. R-1849_14696, p. 7: "From the documents provided it is clear that this situation was discovered during 2012".
[1321] ESOD, para. 295.
[1322] Total value of COs 360, 361 and 362; Exs. C-0225, C-0226 and C-0227.
[1323] Tr. 3542:17-20.
[1324] ESOD, para. 295.
[1325] Ex. R-1849_14696, p. 7: "From the documents provided it is clear that this situation was discovered during 2012".

materials had deteriorated due to poor management – the materials were simply ordered too early and deteriorated irreversibly with the passage of time.

1230. CB&I argues that Reficar acknowledged the lack of CB&I's fault in the damaging of the equipment because in the insurance claim, Reficar blamed the manufacturer, and not CB&I[1326].

1231. CB&I's argument is refuted by the wording of Reficar's letter to the insurer: "[t]his insurance claim being made by REFICAR is based on the good faith arguments presented by CBI, according to which the damages experienced on this date can be attributed to [the manufacturer]"[1327] – it was thus CB&I that initiated the idea to try to obtain insurance money for the damage, and Reficar agreed to it to try to recover the associated costs – it did not, however, acknowledge that CB&I was not responsible.

(iii). Vendors' responsibility

1232. Finally, as regards the alleged responsibility of Vendors for some of the rework, Mr. Hillier only states, with no reference to any evidence, that[1328]

> "LI also omits that, in several instances, it was vendors, not CB&I, who were responsible for these "issues" and the subsequent corrective work".

1233. CB&I's construction expert provides detailed explanations in Section I attached to his report, but fails to quantify any rework amounts that CB&I should be credited due to the alleged responsibility of Vendors[1329].

(iv). Adherence to good construction practices

1234. CB&I argues that its construction work fully complied with good practices, including in the management of construction work packs[1330].

1235. The Tribunal notes that this is a counter-argument whose purpose is to defend CB&I from Reficar's accusations of mismanagement[1331]; however, this argument is inapposite for the determination of Excluded Costs. But, at the same time, CB&I's mismanagement of work packs plays into the narrative of what appears to have happened on the Project.

1236. Work packs "provide discrete work activities to be completed in the field by the construction team"[1332]. The work packs are a system that allows for the efficient and multidisciplinary planning of construction works: each small segment of construction is assigned a work pack, which consists of different categories of information: the necessary engineering documents, budgeted man-hours, lists of materials and equipment and 3D model screenshots necessary to complete the

[1326] RPHB, fn. 844 on pdf p. 180.
[1327] Ex. R-1849_13894, p. 1.
[1328] Hillier ER, para. 4.10.12.
[1329] Hillier ER, Section I, sections I3.2-I3.10.
[1330] RPHB, paras. 414-421.
[1331] CPHB, paras. 178, 331-335.
[1332] Hillier ER, para. 4.4.1.

work[1333]. A work pack was first developed, then issued onto CB&I's internal document management system, and finally released to field construction crews[1334].

1237. What happened on the Cartagena Project is that the work packs were in many cases released by CB&I in a "restricted", or incomplete, state. This meant that some materials might be missing, or that the necessary qualified workers were not assigned, but, theoretically, works could still proceed with regard to the "unrestricted" sections of the work pack.

1238. This practice, according to CB&I's expert, is not unusual[1335]. In Reficar's expert's view, however, the premature and simultaneous releasing of construction work packs was one of the main reasons behind CB&I's inefficiencies in construction[1336]:

- it significantly decreased construction productivity due to the constant shifting of workers from one work pack to another;

- scaffolding was left at abandoned work sites while waiting for further work to become unrestricted (as mentioned in Subsection **e.** *supra*, scaffolding was rented and so this implied a constant increase in costs); and

- in other instances, scaffolds were dismantled and then re-erected, also contributing to extra costs.

1239. The Tribunal is convinced by Reficar's expert.

1240. It appears that CB&I was frantically trying to advance construction work by accelerating wherever possible, without regard to the associated Excess Costs. This finding is in line with the Tribunal's previous conclusions regarding scaffolding and cranes – CB&I deviated from agreed practices in order to improve the situation, but these efforts ultimately led to exponential increases in Excess Costs.

* * *

1241. Thus, the Tribunal finds that all rework-related cost overruns cannot be considered Excluded Costs.

C. Modularization

1242. Construction of the Project was, due to its nature, undertaken mainly in Colombia. The principal exception was modularization, a technique which implied

- the construction of certain pre-fabricated modules off-site at the Island Park facility, situated in the Southern USA and owned and operated by CB&I, and

- the shipping of the finalized modules to the Project site, to be installed in Cartagena with minimal changes.

[1333] Hillier ER, para. 4.4.2.
[1334] Hillier ER, para. 4.4.5.
[1335] Hillier ER, para. 4.4.4.
[1336] LI ER, paras. 185, 705-715.

1243. Modularization was not foreseen in the EPC Contract[1337]. But by mid-2010 CB&I recommended[1338] that Reficar move the production of 58 modules – a number which eventually increased to 86[1339] – to CB&I's factory in Island Park. CB&I said this option offered four key advantages: safety, quality, schedule and risk reduction[1340]. CB&I also said that modularization would only increase the budget by USD 217,000[1341].

1244. Reficar accepted CB&I's proposal and the modularization was agreed upon not in an amendment to the EPC Contract, but in a simple WNOC, which was accepted by Reficar, and which was signed on May 19, 2011, with a ROM +/- 50% estimate of the costs involved[1342].

1245. CB&I relies heavily on the fact that it never made a firm representation that modularization would result in lower costs[1343] and that the estimate was at ROM level, with a 50% accuracy margin[1344] – the Tribunal does not share CB&I's point: the fact that CB&I did not represent to Reficar that modularization would result in a cost reduction does not prove that any possible Excess Costs due to the modularization constitute Excluded Costs.

1246. And such Excess Costs, in fact, arose: the Representation Forecast foresaw modularization costs at USD 92.3 million, while ultimately these costs rose to USD 122.8 million[1345], an increase of USD 30.5 million, or one third.

1247. On February 3, 2012, *i.e.*, one month after the Cut-Off Date, but five months before the Representation Letter, CB&I presented to Reficar a document titled "Reasons Causing Delays and Influence on PF at Island Park"[1346], which means that by early February 2012 CB&I was aware of and had identified the causes for delay and low productivity at Island Park.

1248. CB&I now says that the Excess Cost should be considered as Excluded Costs and should be borne by Reficar. But Respondents rely on facts which all happened before the Cut-Off Date and should, thus have been included in the Representation Forecast:

[1337] The EPC Contract only references "modularization to reduce site work and reliance on local labour" as one of the Driving Forces on the Project under Section 3.1 of the Project Execution Plan.
[1338] Ex. R-0645, pp. 6-7, Ex. R-0680, pp. 29-32, Ex. C-0776, p. 1: "As Reficar is well aware based on your request, CB&I's recommended change to a Modularization strategy for 86 modules is of considerable advantage to the project in terms of cost and time savings".
[1339] ESOD, para. 589. The number in the file is sometimes 85 – this ambiguity was confirmed at the Hearing, see Tr. 1254:5-15.
[1340] Ex. C-0209, p. 2.
[1341] Ex. R-0196.
[1342] Ex. R-0196.
[1343] RPHB, para. 354, citing to Ex. R-0889; ESOD, paras. 583-587.
[1344] RPHB, para. 354, citing to Ex. R-0196, p. 1; ESOD, para. 613.
[1345] Ex. C-0056, tab "Project Summ Cost Report Only".
[1346] Ex. R-0906, p. 1.

- Suppliers were late in delivering materials[1347], which were of poor quality[1348], and furthermore, record heat conditions caused delays[1349]; but all these issues were recorded in a letter addressed to Reficar in September 2011[1350];

- Piping materials were procured late by Reficar – but the evidence proffered by CB&I proves that CB&I was aware of these delays as early as August 2011[1351];

- The procurement of certain items from abroad was agreed in 2011, prior to the Cut-Off Date[1352];

- The productivity at Island Park, due to the different type of work, is not comparable to the on-site productivity in Cartagena[1353]; whatever the productivity was, it must have been taken into account when preparing the Representation Forecast and on its own cannot prove that Excess Costs were Excluded Costs.

1249. Instead, the Tribunal finds more plausible Reficar's argument for the reasons of the Excess Costs in modularization: CB&I had a self-interest in externalizing the module fabrication to the Island Park facility. It thus seems that the WNOC was beneficial to CB&I, who profited from additional orders at its Houston facility, which, prior to the Parties' agreement, was apparently experiencing a period of economic slowdown[1354] had been struggling around the time of negotiating externalizing the work[1355]; this facility would continue to receive funding as long as the works there continued, so any delays would actually benefit CB&I. But this collateral benefit is not indicative – let alone proper evidence – that CB&I improperly or fraudulently induced Reficar to agree to fabricate pipe rack modules in the United States.

D. Materials management

1250. Part of the Excess Costs in construction were incurred in the area of materials management.

[1347] RPHB, paras. 357, 360, citing to Ankura ER, para. 428, Ex. R-1855_043, p. 86 ("Expediting deliveries from SSS to mitigate late delivery for steel to Island Park for 137-02 modules. Behind plan (11Feb11)".).
[1348] RPHB, para. 355, citing to Ex. R-0905, pp. 1-2.
[1349] RPHB, para. 355, citing to Ex. R-0905, p. 2, ESOD, para. 610.
[1350] E.g., Ex. R-0905 dated September 14, 2011.
[1351] RPHB, para. 356, citing to Ex. R-1855_051, p. 22 ("[d]elay in placing piping purchase orders for field rack pipe and Island Park piping materials"); Ex. R-905, p. 1; ESOD, paras. 603-604, 610.
[1352] Ex. R-0906, pp. 5-6 points to a change from the original US to European and Korean suppliers because the US prices were "in some cases, 2.5 times higher". This must have been agreed in 2011 because CB&I's letter points to the relevant POs originating in March 2011 and being modified throughout that year, with the last deliveries made in October 2011, August 2011 and January 2012 (this last one was still a predictable delay, however).
[1353] RPHB, paras. 358-359, citing to Ankura ER, paras. 417-420.
[1354] Ex. C-0210; Ex. C-0211.
[1355] CPHB, para. 154, citing to Ex. C-0210, a press release showing CB&I having to lay off 80 workers in 2009.

1251. Materials management is an important part of construction projects, which entails tremendous logistical endeavours: in order for the works to progress, constant availability of equipment and materials needs to be ensured in real time.

1252. The equipment and materials of the Project were stored in laydown areas, within the Project area or in designated zones in the vicinity, either in Free Trade Zones ["**FTZs**"] or non-FTZ zones.

1253. It was important to secure sufficient FTZ storage space on the Project because materials imported directly to the FTZ zones were granted an exemption for Value Added Tax, significantly lowering their costs[1356]; the FTZ benefits also enabled reductions in the processing time for importing materials and equipment[1357]. Apart from the tax exemptions, on-site laydown areas offered the advantage of allowing for swift delivery of materials to wherever they were needed[1358].

1254. Under the EPC Contract, providing sufficient and proper laydown space was Reficar's responsibility, in accordance with TC 31.1[1359]:

> "31.1 Designated Free Trade Zone laydown and storage areas for the Contractor's use to store equipment and/or materials and for other construction activities will be provided by the Owner at locations designated by the Owner for the Contractor's use. The Contractor shall confine the storage of all equipment and/or material to such storage and laydown areas and shall do so in accordance with all applicable Laws".

1255. CB&I argues that Excess Costs did not arise because of a breach of its Cost Control Commitments – at all times it employed an adequate system for materials organization and tracking and implement appropriate procedures for materials preservation and maintenance[1360] [**a.**]. According to CB&I, any Excess Cost is attributable to Reficar's own failures to provide sufficient lay-down space [**b.**], and FTZ zones [**c.**], triggering the need to transport materials to safeguard their tax-exempt status.

a. <u>Adherence to procedures</u>

1256. CB&I argues that it followed good construction practices in preserving and maintaining materials[1361] and that it fully incorporated the use of its SmartPlan Materials ["**SPM**"] tracking system[1362].

1257. CB&I's expert, Mr. Hillier, has stated that Reficar and its expert, Long International, have failed to prove any serious deficiencies in the SPM system, which worked according to the contractual and procedural requirements, in his

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[1356] See e.g. Ex. R-0972, p. 18 (p. 57 for English): "As of August [...], we have saved USD 2999,602 in tariffs and VAT. This saving represents 28.4% of the value of all entries to the Free Trade Zone".
[1357] Ex. R-0974, p. 1.
[1358] ESOD, paras. 676-677.
[1359] JX-002 and JX-004, EPC Contract, Section II, at TC 31.1
[1360] RPHB, para. 373, citing to Hillier ER, Para. E, sections E.5.1.4-.5, E8.4-5., E4.4.1-4, E8.3-5.
[1361] RPHB, paras. 373, 389-390.
[1362] RPHB, para. 373; ESOD, paras. 639-641.

opinion[1363]. CB&I's materials manager, Mr. Baker, has confirmed CB&I's compliance with its materials management obligations[1364].

1258. CB&I also cites to the March 2013 Jacobs Report, in which the consultant stated that the "[w]arehouses and lay down yards appeared to be in good order, well laid out and housekeeping issues well taken care of"[1365].

1259. Reficar, on the other hand, avers that CB&I failed to successfully implement the SPM tracking system; instead of the SPM, CB&I was inputting data manually into Microsoft Excel spreadsheets[1366]. This led to multiple errors with reverberations for procurement and construction, as materials were constantly shifting in an erratic manner.

1260. Furthermore, Reficar paid for half a million surplus supplies of pipe insulation materials and of electric cables that CB&I was forced to buy, simply because it failed to properly track the materials on site[1367], as supported by Mr. Suárez[1368]. CB&I's Mr. Baker retorts that surplus materials were ordered simply to ensure that there were sufficient amounts available for construction needs[1369]; and, when offered the right to sell these materials back to the Vendor, Reficar refused[1370].

1261. The Tribunal finds itself before conflicting evidence:

- the photographs presented by CB&I show perfect order in the storage of materials[1371] and those proffered by Reficar display laydown areas in complete disarray[1372];

- likewise, the experts for Claimant[1373] and Respondents[1374] fully support their respective (contradictory) positions.

1262. But, ultimately, the Tribunal takes Reficar's side.

1263. The Tribunal is convinced by the witness statement of Mr. Suárez, who has testified that Reficar was forced to pay for a surplus 25% amount of pipe insulation materials and a 30% surplus of electrical and instrumentation cables due to CB&I's failure to account for materials already being stored in the laydown areas[1375]. This failure could not have been caused by any interferences by Reficar and was in fact caused by CB&I's poor management – Mr. Baker acknowledges that CB&I simply wanted to ensure steady supply of cables, without regard to the extra costs[1376]. Mr. Baker

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[1363] Hillier ER, paras. 4.6.4-4.6.10.
[1364] Baker RWS, Tr. 3505:18-3617:20.
[1365] Ex. R-3274, p. 26.
[1366] CPHB, para. 311, citing to Suarez CWS, para. 75 and LI ER, paras. 699-702.
[1367] CPHB, para. 309, 311-313.
[1368] Suarez CWS, para. 190.
[1369] Baker RWS, paras. 144-152.
[1370] Baker RWS, para. 153, Hillier ER, para. 4.6.22.
[1371] Ex. R-1996_00589 and Ex. R-1996_03202; slides 373 and 374 of H-002.
[1372] Unnumbered exhibit, titled "Photograph from January 2013" at ESOC, fn. 726.
[1373] LI ER, paras. 695-704.
[1374] Hillier ER, para. 4.6, Section E.
[1375] Suarez CWS, para. 190.
[1376] Baker RWS, paras. 144-152.

also mentioned that Reficar was offered a buyback option[1377], but the Tribunal finds that Reficar made the reasonable decision rejecting to sell the excess cables back to the Vendor, as the conditions under the memorandum were highly disadvantageous to Reficar[1378].

1264. Also, although the Jacobs Report from March 2013 cited by CB&I does state that, at that time, the lay down areas appeared to be in good order[1379]; at the same time, it pointed out that the onsite logistics were very congested, with equipment partially blocked and even damaged from site congestion, and, additionally, Jacobs observed the absence of site supervision during peak times[1380].

1265. The Tribunal finds that the results of a Foster Wheeler audit report from 2011[1381] and letters from Messers. Gilchrist and Riera to Mr. Deidehban from 2011[1382] and 2013[1383], respectively, prove that the SPM system was not properly implemented.

1266. Finally, none of the other arguments presented by CB&I as to its adherence to good construction practices in the area of materials management, even if they were to be accepted, could explain the undeniable fact that there were construction delays and excess materials bought due to mismanagement of the materials.

1267. The Tribunal will now move to CB&I's case that Reficar breached its contractual obligations regarding materials management, leading to Excess Costs.

b. <u>Sufficient lay-down space</u>

1268. Under the EPC Contract, the responsibility for providing lay-down areas corresponded to Reficar, but the Contract did not require any specific amount[1384].

1269. The Parties hold opposite views as to how much lay-down area Reficar was obliged to provide:

- Reficar refers to a communication dated May 2009[1385] and a letter from February 2010[1386], where the Parties agreed to, approximately, 50 hectares ["**ha**"] – these agreements were reached prior to Contract execution;

- CB&I, however, invokes two internal documents prepared by Reficar in August and December 2010, *i.e.*, post-Contract execution, that show that 60 ha[1387] and 128.7 ha[1388], respectively, were necessary; CB&I also points to

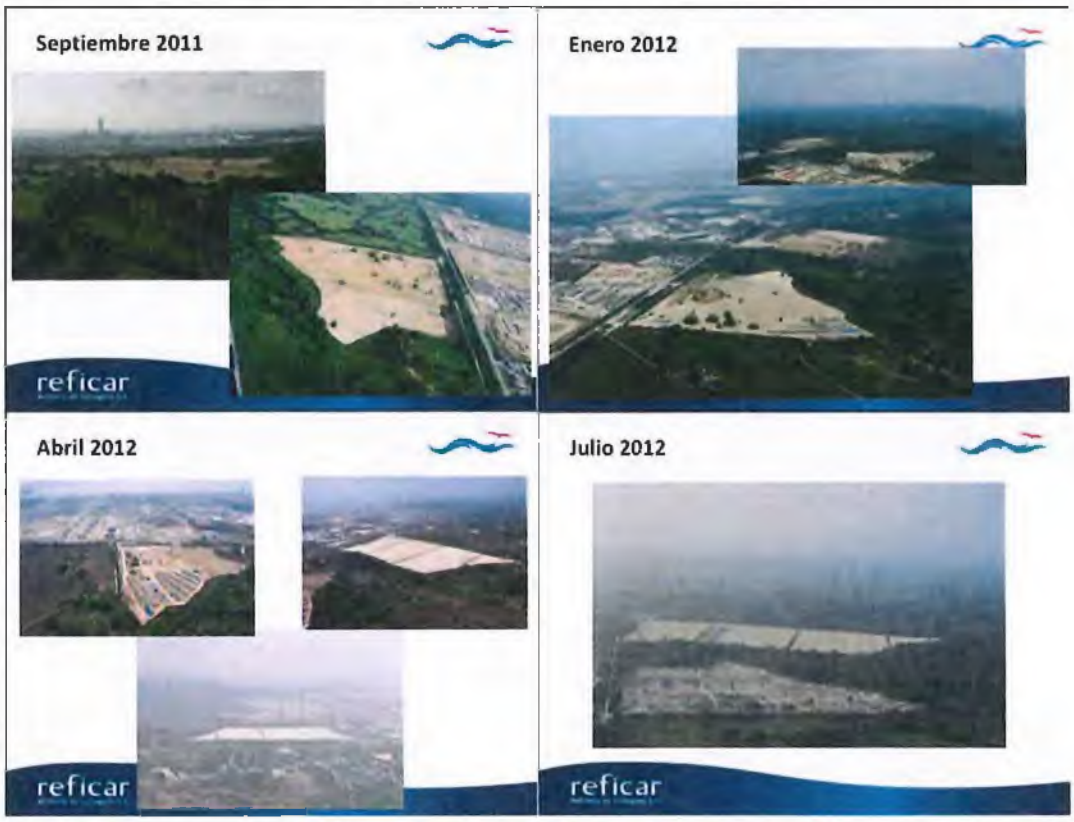
[1377] Baker RWS, para. 153, Hillier ER, para. 4.6.22.
[1378] Ex. R-2627, p. 2, listing conditions for what types of cable could be bought-back, the limit of 15% of maximum quantities of cables eligible for buy-back, Reficar's responsibility for shipping costs, charges and duties for transport to Texas, and a 4% extra consignment fee for all cable returned.
[1379] Ex. R-3274, p. 26.
[1380] Ex. R-3274, p. 25.
[1381] Ex. C-0149, pp. 1-3.
[1382] Ex. C-0147, p. 1.
[1383] Ex. C-0104, p. 13.
[1384] Reply, paras. 626-629.
[1385] Ex. C-0806 (stating that the required space was "[a]n area of approximately 50 hectares") and Ex. C-1858, p. 4 ("The lay down yard requirement is of 50 hectares approximately, but there is some flexibility").
[1386] Ex. C-1860.
[1387] Ex. R-0646, p. 3.
[1388] Ex. R-0976, p. 65.

a report prepared for Ecopetrol by Jacobs consultancy in March 2013, according to which "CB&I originally requested, contractually, 300+ acres [*i.e.*, 121 ha] for onsite lay down storage"[1389].

1270. Of the two positions, the Tribunal tends to favour Reficar's: the 50 ha. figure agreed by the Parties (or at least communicated to one another) at a time which preceded the execution of the EPC Agreement seems to better reflect the intention of the Parties when contracting.

1271. In any event, the relevant issue is whether Reficar breached any obligation acquired contractually. In a letter from early 2012 CB&I acknowledges that Reficar had in fact provided 85.24 ha of laydown space[1390]. This shows that Reficar complied with its obligation.

1272. And there is further evidence that attests to it: Reficar's General Construction Director has testified that CB&I actually never ran out of laydown space[1391], and this statement was confirmed by Reficar's expert, Long International[1392]. Furthermore, Reficar has marshalled a collection of photos, showing over the years empty or close to empty laydown areas[1393]:



[1389] Ex. R-3274, pdf p. 25.
[1390] Ex. C-1381, p. 3.
[1391] Suarez CWS, para. 168.
[1392] LI ER, para. 174.
[1393] Ex. C-1848.

1273. Weighing the available evidence, the Tribunal concludes that Reficar has not breached its contractual commitments as regards the provision to CB&I of sufficient lay down areas.

c. FTZ laydown space

1274. CB&I submits a separate argument as regards FTZ laydown space.

1275. CB&I argues that the FTZ laydown space provided by Reficar was insufficient[1394]: Reficar was required to provide at least 128 ha, or 318 acres, of laydown space in the bounds of the Project site[1395], but Reficar only provided a "fraction"[1396] of the necessary areas – in a letter from October 2014, CB&I stated that the area provided only amounted to 73 acres[1397].

1276. CB&I maintains that the use of off-site laydown areas imposed severe incumbrances on CB&I, as it needed to repeatedly move materials between non-FTZ and FTZ areas to retain their tax-exempt status[1398]; the arrangement also limited CB&I's ability to unpack certain crates and required it to re-organize the materials on an ongoing basis[1399].

1277. In 2010, *i.e.*, well before the Cut-Off Date, CB&I presented a plan of extending the FTZ status to an additional laydown area, through the construction of a footbridge valued at USD 1.4 million. Reficar rejected the relevant WNOC due to its "low priority"[1400].

1278. The Tribunal agrees with CB&I that most laydown areas were outside the Refinery site, the arrangement of non-FTZ and FTZ areas was not optimal, requiring materials to be repeatedly moved for tax reasons. But CB&I must have been aware, when it issued the Representation Forecast as of the Cut-Off Date, that the arrangement of lay down areas in Cartagena was sub-optimal, and so the additional costs caused by the situation and characteristics of the available laydown areas, must have been included in the USD 3,971 million estimate.

1279. That said, the Tribunal does have some sympathy with CB&I's defense that the lay down areas did cause additional costs due to shortcomings outside CB&I's scope of control, and there is evidence that, after the Cut-Off Date, extraordinary costs arose, of such magnitude that CB&I actually presented a Change Order:

1280. In October 2014 it submitted Change Order 285, with a value of USD 9.9 million, for equipment to properly manage the storage areas, on the basis of a WNOC submitted in early 2012[1401].

[1394] ESOD, para. 675; Ex. R-0974; Ex. R-0975.
[1395] ESOD, para. 676, citing to Ex. R-0975, p. 1.
[1396] ESOD, para. 676, citing to Ex. R-0975 and Ex. R-0646, p. 3.
[1397] Ex. R-0975, p. 1.
[1398] ESOD, paras. 680, 682-686.
[1399] ESOD, paras. 680, 682-683, citing to Ex. R-0975 and Ex. R-2787.
[1400] ESOD, paras. 677-679, citing to Ex. R-1790.
[1401] WNOC 395; Change Order 285, Ex. B-038.

1281. Claimant rejected the requests, without good reason – in fact, Reficar relies on this Change Order as proof of having granted CB&I additional funds[1402].

1282. As anticipated under Section VII.2.1.3.3.2., the Tribunal is prepared to accept the value of this Change Order as Excluded Costs, on the assumption that the underlying costs must relate to additional cost for upgrading the laydown areas, which could not have been predicted at the time of issuance of the Representation Forecast.

1283. In light of the above, the Tribunal finds that USD 9.9 million of the cost overruns related to FTZ laydown space should be considered as Excluded Costs.

E. Craft labour productivity

1284. A key component in any estimate, including the Representation Forecast, are the craft productivity factors ("PFs") used in these projections. These factors describe how efficiently craft workers are able to perform their construction tasks; selecting higher or lower PFs has a profound impact on the estimation of the time, and by extension the costs, which the construction works will require. The higher the PFs, the lower the productivity expected in Cartagena, the more conservative the prediction and the higher the resulting cost estimate.

1285. In its February 2010 Estimate CB&I reduced the greenfield PF to 1.66. The Tribunal has already found that CB&I introduced this figure at the request and with full knowledge by Reficar, that this figure was undervalued and that it represented a substantial risk factor [see Section VII.1.1.5.A.c *supra*]. The same greenfield PF of 1.66 was used in the Representation Forecast.

1286. In the end, the actual productivity on the Project was extremely poor: it ended up in the range between 3.02 and 3.25[1403], which means that craft workers on average took twice as long as planned (the PF in the Representation Forecast was 1.66) to complete the works.

1287. CB&I argues that one of the reasons for the existence of Excess Costs is that the Representation Forecast was calculated with a PF which had been instructed by Reficar and which Reficar knew undervalued the actual productivity which could be attained in Cartagena[1404]. The Excess Cost caused by using Reficar-instructed insufficient PFs should be considered Excluded Costs, for which CB&I is not to assume responsibility.

1288. The Tribunal, having already found that the low PFs had been imposed by Reficar, agrees with CB&I. In fact, even Reficar's own expert, Long International, accepts that CB&I should be credited for the imposed PFs.

[1402] See ESOC, para. 301: "In all, Reficar provided nearly US$ 10 million for equipment and labour for CB&I to locate and handle the materials and equipment stored in the laydown areas".
[1403] Tr.: 5796:15-21: "[…] As part of his discussion on this topic, [Mr. Hillier] notes that he calculated the actual multiplier on the project and found it was 3.02". Reficar's expert, LI, instead of providing a Project craft productivity multiplier says that "cumulative site productivity ended up at about 0.51, compared to the planned Project productivity of 1.0", see LI ER, para. 767. Extrapolating this number from the February 2010 Estimate's PF of 1.66 gives a PF of 3.25, which is relatively close to 3.02.
[1404] RPHB2, para. 24; RPHB, para. 195.

1289. The real discussion is how much should be credited. Long International has quantified the credit at USD 53.88 million[1405]. CB&I believes it to be too low[1406] and the Tribunal agrees: there is evidence prepared by CB&I at the time of the Cut-Off Date, *i.e.*, *in tempore insuspecto*, showing the cost impact of different PFs as a sensitivity analysis[1407] – a PF of 2.6 would imply USD 215.3 million additional costs.

1290. CB&I in fact confirmed the accurateness of this sensitivity estimation when in October 2012 it recalculated its EPC costs, this time not using the PFs imposed by Reficar, but rather its best estimate of actual PFs: forecasted EPC costs rose by the precise number of USD 215.3 million[1408]. In other words: the Representation Forecast would have been higher by USD 215.3 million, if CB&I had used its best forecast of PFs, instead of the figures imposed by the Owner.

1291. Summing up, the Tribunal finds that USD 215.3 million of Excluded Costs must be deducted from the Excess Costs, on account of craft labour productivity.

F. Labour disruptions

1292. Labour disruptions during the Project arose due to conflicts with the Petrol Industry Union, the *Unión Sindical Obrera de la Industria del Petróleo* ["**USO**"], which came to represent more than 4,500 employees on-site[1409].

1293. USO is the Colombian labour union in the oil industry[1410]. Even though it is a union in the oil (and not construction) sector, jobsite workers had the right to join it, because the construction works in the Refinery were activities characteristic of and essential to the oil industry, as recognized by both labour experts[1411].

1294. CB&I maintained a log in which it listed all the incidents with USO[1412]: the first incident was registered on March 10, 2008[1413]. Up until the Cut-Off Date, CB&I listed 44 incidents in the USO Log[1414] and filed the same amount of USO-related WNOCs, for approximately USD 1.3 million[1415].

1295. Following the Cut-Off Date, CB&I listed 128 incidents in the USO Log[1416] and filed 65 USO-related WNOCs for approximately USD 814 million[1417].

1296. Most of the Excess Costs incurred after the Cut-Off Date were due to labour disruptions that arose during mid-2013, when USO presented a formal list of 22 demands to CB&I (*Pliego de Condiciones*) ["**List of Demands**"]. The List of

[1405] LI ER, paras. 1129-1132; Table 9.4-4.
[1406] Ankura ER, paras. 536-539; quote from para. 539.
[1407] Ex. R-1914, p. 23; see also Yibirin WS, para. 89.
[1408] Ex. C-0096, p. 17, row 19 "PF Adjustments – All Disciplines".
[1409] According to José Marrugo, 4.500 CB&I employees had affiliated to USO by the end of 2013 (Marrugo CWS, para. 46).
[1410] Herrera ER, para. 47; Molina ER, p. 23.
[1411] Herrera ER, para. 57; Molina ER, p. 21.
[1412] Ex. R-1738.
[1413] Ex. R-1738.
[1414] Ex. R-1738.
[1415] Ex. C-0224.
[1416] Ex. R-1738.
[1417] Ex. C-0224.

Demands is a negotiation mechanism set forth under Colombian Law and its presentation by the union triggers the contractor's obligation to negotiate the demands with the union[1418].

1297. During these negotiations, the relationship with USO deteriorated even further, and culminated with an official labour strike, that effectively shut down the Project for an indefinite period starting on September 20, 2013[1419].

1298. CB&I reacted immediately and resumed negotiations with, presumably, a position more open to conceding in the List of Demands. Soon thereafter, on September 23, 2013, CB&I and USO executed a Collective Bargaining Agreement ["**Bargaining Agreement**"] that met USO's petitions included in the List of Demands[1420]; in exchange, USO agreed to lift the strike, thus assuaging CB&I's biggest concern[1421].

1299. CB&I says that the Excess Costs arising from labour disruptions should be considered Excluded Costs, for which it should bear no responsibility. To support this, Respondents submit a number of arguments, which are denied by Reficar:

1300. First, according to CB&I, Reficar was in control of managing labour relations with USO[1422]:

- Reficar had unilateral control over wages, including productivity bonuses, as it oversaw the "Procedure for the Implementation of the Salary Policy of Reficar S.A. Applicable to Employees of Contractors during the Construction of the Cartagena Refinery and Expansion Project" ["***Política Salarial***"][1423]; and

- Reficar instructed CB&I not to negotiate or reach any agreement with USO[1424].

1301. Reficar denies having interfered and being involved in the management of labour relations[1425]. And it further counters that it was CB&I's obligation under the EPC contract to manage labour relations with USO. Under the EPC Contract, CB&I:

- Assumed full responsibility for the acts of its own employees and those of the Lower Tier Subcontractors[1426];

- Agreed to defend, indemnify, and hold Reficar harmless from any claim related to CBI's breach of its social security payment obligations under Colombian law[1427];

[1418] CL-0313, Colombian Labour Code, Art. 433.
[1419] Ex. R-1838.
[1420] Ex. R-1038.
[1421] Ex. R-1038 (Bargaining Agreement, p. 6).
[1422] ESOD, para. 925.
[1423] ESOD, para. 926.
[1424] ESOD, para. 932.
[1425] Reply, para. 820.
[1426] JX-002, TC 44.1, p. 215.
[1427] JX-002, TC 44.3.1, p. 217.

- Committed to use all reasonable efforts to prevent any unlawful, riotous, or disorderly conduct or behaviour by or amongst its employees and those of its subcontractors[1428];

- Committed to notify the Owner of any actual or potential labour dispute which might affect the works[1429]; and

- Agreed to fully comply with the applicable laws addressing employment matters[1430].

1302. Second, CB&I puts the blame for labour disruptions on Reficar and Ecopetrol:

- Certain changes or omissions in the *Política Salarial* caused additional labour disruptions, including Reficar's decision to treat workers' attendance bonuses as non-salary compensation[1431]; and

- A large percentage of the disruption events were instigated by Ecopetrol employees in the brownfield (the old Refinery area); Ecopetrol rarely disciplined or prevented them from disrupting CB&I and its subcontractors[1432].

1303. Reficar retorts that USO complaints were not caused by base salary issues: USO's primary demands during the Bargaining Agreement negotiations were intended to push CB&I to comply with its Colombian labour law obligations[1433].

1304. Subsidiarily, CB&I denies responsibility for labour disruptions which occurred prior to 2011. According to Respondents, their obligations to manage relations with USO only arose after the first USO employee joined the union in 2011[1434]. Moreover, CB&I argues that Colombian law did not allow CB&I to formally negotiate with USO until the union filed the List of Demands[1435].

1305. Reficar retorts that, from the outset of the Project, CB&I had the constitutional, legal and contractual obligation to recognize USO as a valid partner, by receiving its representatives and processing its petitions[1436].

1306. The Tribunal finds most of the above discussion to be inapposite, because the relevant question really is whether, as of the Cut-Off Date, CB&I was fully aware that labour management issues were causing huge disruptions; the Tribunal thinks that it was [**a.**], with one exception: the Bargaining Agreement [**b.**].

[1428] JX-002, TC 44.5, p. 218.
[1429] JX-002, TC 44.6, p. 218.
[1430] JX-002, TC 14.6, p. 187; JX-002, TC 44.3.1, p. 217.
[1431] ESOD, para. 954.
[1432] RPHB, para. 439.
[1433] Reply, para. 832.
[1434] RPHB, para. 447. The Tribunal notes that CB&I has referred to two different dates for this event: throughout its written submissions, CB&I has argued that the first CB&I employee joined USO in January 2013 (RPHB, para. 447). However, under para. 434 of RPHB, CB&I indicates the first CB&I employee joined USO in January 2011. Ex. C-1324 confirms this latter date.
[1435] ESOD, para. 933; RPHB, para. 448.
[1436] Reply, paras. 781-782.

a. Foreseeability of labour disruptions

1307. Labour disruptions occurred from the outset of the Project[1437]; as of the Cut-Off Date, the Project had already suffered a schedule impact of more than 50 days due to work stoppages[1438].

1308. And the two events which caused major disturbances – and for which, allegedly, Reficar and Ecopetrol should be responsible – also happened before the Cut-Off Date:

- Reficar's decision to treat workers' attendance bonuses as non-salary compensation occurred on March 29, 2011[1439]; and

- Disruptions by Ecopetrol employees in the brownfield were already occurring as early as of February 2011[1440].

1309. Furthermore, concurrently to the Cut-Off Date, CB&I expressly acknowledged the foreseeability of labour disruptions. In a letter sent by CB&I to Reficar on December 2011, CB&I stated that[1441]:

> "USO's work stoppages and threats had prevented CB&I from performing critical pre-turnaround work inside the Refinery (…). Since November 1, 2011 CB&I has only been able to work 3 full days inside the Refinery (…). 22 days are the result of USO work stoppages and safety threats to CB&I and its subcontractors".

1310. CB&I concludes the letter stressing that "these disruptions will continue to impact our efforts in the field"[1442]. Subsequently, CB&I estimated the cost impacts of these disruptions in 12 WNOCs for an approximate amount of USD 843,300[1443].

1311. As to the question of who bears responsibility for the disruptions, the Tribunal notes that, even accepting CB&I's position, its labour obligations would still have commenced on January 25, 2011 (almost a year before the Cut-Off Date), when Respondents received a letter from USO informing CB&I that their first employees voluntarily decided to affiliate to the union[1444].

1312. Consequently, when it issued the Representation Forecast, CB&I was already aware that it was responsible for the costs associated with labour disruptions, that disruptions had already occurred prior to the Cut-Off Date and that it foresaw that this scenario would continue affecting the Project.

1313. In view of this, CB&I's arguments on labour management control can never transform Excess Costs into Excluded Costs, because the Representation Forecast must have included CB&I's Class I estimate of the labour costs which would be

[1437] Ex. R-1738.
[1438] Ex. C-0224.
[1439] Ex. R-1296.
[1440] Ex. R-0951.
[1441] Ex. C-1316.
[1442] Ex. C-1316.
[1443] Ex. C-0224.
[1444] Ex. C-1324, p. 4

incurred in the Cartagena Project, taking into consideration the labour disruptions which had become the norm given the involvement of USO.

b. The Bargaining Agreement

1314. Notwithstanding the above, there is one event that could not have been foreseen by CB&I as of the Cut-Off Date: the execution of the Bargaining Agreement. The Tribunal considers that this is an Unpredictable Event for the following reasons:

1315. First, although labour disruptions had occurred prior to the Cut-Off Date, these were never of such a magnitude as to give rise to a List of Demands – let alone an indefinite strike as a means to enforce such demands. This unexpected – and rather desperate – situation triggered the need for CB&I to negotiate and execute a Bargaining Agreement.

1316. Even Reficar acknowledged at the time that the situation was a "labour abnormality" [1445].

1317. Second, the costs associated with the execution of the Bargaining Agreement were significantly higher than those calculated by CB&I in the WNOCs filed before the Representation Forecast:

- Whilst the 44 USO WNOCs from the period before the Cut-Off Date amounted to USD 1.3 million[1446];

- As will be seen, the direct costs of the Bargaining Agreement were calculated by CB&I at USD 171 million[1447].

1318. The reason for such a costly Bargaining Agreement is because its scope covers:

- Monthly payments to workers for food services[1448] and mobilization allowance for national workers coming from outside Cartagena[1449];

- A one-time payment of COP 60,000 to USO for union allowance[1450] and of COP 500,000 to all CB&I workers as a signing bonus[1451];

- A general increase of salaries and bonuses[1452]; and

- Changes to the health and security and compliance bonuses[1453];

[1445] Ex. R-0230.
[1446] C-0224. This amount comprises all WNOCs related to labour or USO-related work disruptions, that arose before the Cut-Off Date.
[1447] Ex. B-038, Attachments to WNOC No. 000831, p. 112.
[1448] Ex. R-1038 (Art. 5, Bargaining Agreement).
[1449] Ex. R-1038 (Art. 13, Bargaining Agreement).
[1450] Ex. R-1038 (Art. 9, Bargaining Agreement).
[1451] Ex. R-1038 (Bargaining Agreement, p. 6).
[1452] Ex. R-1038 (Art. 12, Bargaining Agreement).
[1453] Ex. R-1038 (Art. 14, Bargaining Agreement).

1319. There is one additional, but compelling, argument in support of considering the costs of the Bargaining Agreement as Excluded Costs: at the time the agreement was stricken Reficar expressed its willingness to assume all related costs:

1320. The *Política Salarial*, which was under the control of Reficar, sets forth detailed and mandatory guidelines for managing labour compensation on the Project. According to TC 44.8 the EPC Contract, CB&I had to adhere to the guidelines mandated by Reficar in the *Política Salarial*:

> "Without limiting the Contractor's obligations under this TC44, the Contractor shall procure that the salary and/or wage of each of its employees and each of its Lower Tier Subcontractors' employees shall not be less than the minimum legal salary and/or wage under any applicable Laws and the guidelines for employees' salaries relative to their position established by the Owner. The Contractor shall procure that the Contractor and its Lower Tier Subcontractors only deduct such amounts from their employees as are permitted by applicable Laws". [Emphasis added]

1321. The *Política Salarial* expressly indicates that it was prepared and revised by Reficar's internal employees and that any updates should be performed by the financial department of Reficar[1454]. Furthermore, Reficar warned CB&I throughout the Project that it would suffer penalties under the EPC Contract if it failed to comply with the *Política Salarial*[1455].

1322. Given that USO's demands had a direct impact on issues regulated under the *Política Salarial*, Reficar reminded CB&I that it needed to obtain its prior approval before entering into any agreement with USO[1456]. And Reficar added that, subject to such approval, it agreed to reimburse CB&I for any increased costs associated with the Bargaining Agreement[1457]:

> "Provided that CBI can negotiate reasonably acceptable terms with USO, and provided that CBI has obtained our prior approval before executing any final binding agreement with USO, we shall reimburse CBI for increased costs associated with meeting the agreed-upon increases in labour rates. This reimbursement of costs shall be made in accordance with the EPC Contract". [Emphasis added]

1323. Reficar's BofD granted this approval by agreeing to CB&I's costs projections of the Bargaining Agreement during the BofD meetings of September 3, 2013, September 9, 2013, and September 23, 2013[1458].

1324. Therefore, the Tribunal finds that the Excess Costs directly arising out of the Bargaining Agreement should be considered Excluded Costs.

[1454] Ex. R-1012, pp. 1 and 14.
[1455] Ex. R-1255; Ex. R-1256; and Ex. R-1289.
[1456] Ex. R-0230.
[1457] Ex. R-0230.
[1458] Ex. R-1339, p. 1.

Quantification

1325. The Tribunal will turn now to the quantification of the costs related to the Bargaining Agreement.

1326. In WNOC 831, CB&I included an estimate for the Bargaining Agreement Excess Costs in the amount of USD 171 million[1459]. The figure seems quite accurate, as Reficar acknowledged in its Statement of Claim that the Bargaining Agreement "cost Reficar over USD 100 million in additional compensation"[1460].

1327. In line with the above finding, the Tribunal has already anticipated under Section 3.3.2 that WNOC 831 should be partially accepted.

1328. Since the Bargaining Agreement is the only factor for which Reficar should assume responsibility, the rest of WNOC 831 and the totality of WNOC 802 is rejected, as they cover work stoppages and disruptions that should have been foreseen by CB&I in the Representation Forecast.

1329. In light of the above, the Tribunal finds that USD 171 million of the cost overruns for labour disruptions should be considered Excluded Costs.

G. Procurement

1330. Procurement was an activity which CB&I was obliged to perform under the EPC Contract – further to engineering and construction. CB&I's role in this activity included the definition of the equipment which had to be procured, and the selection of the appropriate Vendor.

1331. There is a marked difference between engineering and construction, on one side, and procurement on the other. In engineering and construction, CB&I would carry out the required activities under its own responsibility (sometimes involving sub-contractors), while in procurement, CB&I was tasked with "procurement services"[1461], delineated in detail in the Procurement Execution Plan annexed to the EPC Contract[1462]; these services were meant to support Reficar in its management of procurement on the Project.

1332. The EPC Contract reflects this distinction. It defines "Equipment" as "equipment, machinery, apparatus, materials, articles and things of all kinds to be procured by

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[1459] B-038, Attachments to WNOC No. 831, p. 112; C-0260, USO Schedule Estimate, November 1, 2013 (Under this exhibit, CB&I estimated that the Bargaining Agreement Excess Costs would amount to USD 171 million in a high range scenario. This scenario was then applied by CB&I when filing WNOC No. 831). The Tribunal notes that, according to Long International – Reficar's Expert – CB&I later updated this amount, lifting it to in between USD 190 and 258 million (see Long International ER, para. 1206), but Reficar has taken issue with this increase, as CB&I offers no support or explanation (see Long International ER, para. 1206), and the Tribunal agrees

[1460] ESOC, para. 393.

[1461] TC 26.1 "Responsibilities", JX-002, p. 201; JX-004, p. 185.

26.1.1 In accordance with the Scope of Work, the Contractor is responsible for providing all procurement services (including the administration of any Purchase Offers after they have been entered into by the Owner) necessary for the Work" [Emphasis added].

[1462] See division of responsibilities matrix under the Procurement Execution Plan annexed to the EPC Contract; JX-002, pp. 487-490; JX-004, pp. 462-465.

the Owner from the Vendors and incorporated in the Refinery"[1463]. Unlike subcontractors (which entered into contracts with CB&I), Vendors were bound by contracts entered into directly with Reficar, and not CB&I. This is proven by the definition of Purchase Offer in TC 1:

> "'Purchase Offer' means any contract of any type between the Owner and the Vendor for the supply of Equipment by the Vendor[1464]".

1333. That Reficar was the party in charge of procurement is further confirmed by the fact that, unlike for subcontractors, Reficar was responsible for making payments to the Vendors[1465]:

> "26.1.4 The Contractor will ensure that each Purchase Offer will contain warranty requirements which are acceptable to the Owner (acting reasonably) for any materials, Equipment, machinery, spare parts, or supplies that are purchased from Vendors. The Owner will be responsible for making all payments under the Purchase Offers referred to in TC26.1.3 and will have recourse only to the relevant Vendors of such Equipment for satisfaction of any Vendor warranties. The Contractor shall assist the Owner in the enforcement of any Vendor warranties but shall not be required to institute any arbitration or litigation proceedings (although the Contractor must still provide assistance to the Owner during such proceedings)". [Emphasis added]

1334. For its role CB&I was entitled to receive a remuneration that was not calculated separately – it was simply part of the general Fixed Fee arrangement under the Contract[1466]. This means that CB&I had no opportunity of receiving any kick-back for its procurement services and had no direct incentive to underperform.

1335. The Representation Forecast estimated that procurement costs would amount to USD 1,651.6 million[1467]. Reficar eventually paid USD 1,889.5 million (as proven by the close-out cost report for the Project[1468]), resulting in Excess Costs of USD 237.9 million.

1336. CB&I argues that the Excess Costs incurred as a consequence of the procurement activity should be considered Excluded Costs: it cannot be made responsible for the performance of the supply contracts entered into directly between Reficar and the Vendors. CB&I could never have breached the Cost Control Commitments with regard to supply agreements entered into, and payments made directly, between the Vendors and Reficar[1469].

1337. The Tribunal sides with CB&I. The USD 237.9 million Excess Costs arose, not because CB&I breached any of its Cost Control Commitments, but rather because

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[1463] JX-002, p. 164; JX-004, p. 150.
[1464] JX-002, p. 169; JX-004, p. 155.
[1465] Communication C-175, p. 5, Table 1; LI ER, paras. 1227-1241.
[1466] TC 58, JX-002, p. 235; JX-004, p. 211-212; JX-003, pp. 3-4; JX-005, p. 3.
[1467] Ex. R-1851_057_00017, tab "Project Summary", Line "Onshore/Offshore Procurement", column "Forecast".
[1468] Ex. C-0056, tab Project Summary, Forecast Column. The Tribunal notes the close proximity of the Actual Costs column – although the Forecast is a more accurate metric given how not all costs had been captured in the Actual Costs column at the end of December 2015.
[1469] Ankura ER, paras. 342-343, 366,

the Vendors eventually charged Reficar more than had been anticipated. This is a unique situation unlike any seen in the previous sections: it does not deal with Excess Costs emanating from CB&I's or Reficar's performance, but of a third-party.

1338. The necessary consequence is that the Excess Costs of USD 237.9 million, incurred for the payment to third party suppliers, must be considered as Excluded Costs.

1339. There is a further argument: in this cost overrun claim, Reficar is asking for the claw back of certain payments made to CB&I, under the argument that these payments were improper. Procurement payments made cannot be clawed-back from CB&I, because these payments did not flow to CB&I, but rather to a third-party Vendor. What has not been paid cannot be clawed-back.

H. Prolongation costs

1340. Reficar brings a claim for *daño emergente* caused by the delay suffered in the Project – a claim which CB&I rejects, averring that the delay is to be imputed to Reficar's conduct. This issue will be analysed by the Tribunal under Section VII.2.3 *infra*: the Tribunal will find that of the total 522 days of delay materialized after the Cut-Off Date CB&I is responsible for 334 days, and Reficar for 188.

1341. In this section, the Tribunal has to determine a related issue: if the finding that out of the total 522 days of delay 188 days are to be imputed to Reficar implies that certain additional Excluded Costs must be credited in CB&I's favour[1470].

1342. It is a general principle of all construction activity that an extension of the expected schedule implies that the constructor has to incur certain additional expenses. This general principle is accepted by Long International, the expert designated by Reficar, who acknowledged that due to the prolongation of the schedule, CB&I's costs associated with maintaining the management team, increased by 250%[1471].

1343. When CB&I issued its Representation Forecast, costs were calculated assuming that there would be no delay for causes imputable to the Owner. In reality, Reficar's conduct then resulted in 188 days of delay. The prolongation costs caused to CB&I by such delay should be considered as Excluded Costs and as such should be deducted from Reficar's Claw Back.

1344. What is the correct calculation of the prolongation costs suffered by CB&I?

1345. Reficar's expert, Long International, estimated that CB&I billed (and Reficar paid) the costs for

- the site construction management team at a daily rate of USD 763,970 and
- scaffolding at a daily rate of USD 71,606[1472].

[1470] The Tribunal will also find that 203 days of delay had already materialized prior to the Cut-Off Date. This finding is irrelevant for the present section, as any associated costs to this specific delay should had been foreseen by CB&I under the Representation Forecast.
[1471] LI ER, paras. 1261-1262.
[1472] LI Attachment to JER 6 (Table 9.4-32 Rev. 1).

According to Long International, these were the items that resulted in the prolongation costs of the Project[1473], and they sum up to a daily rate of USD 835,576[1474]:

Site Indirect Costs - Prolonged Schedule and Excessive Indirects				
Description	Start	Finish	Duration	Total
Calendar Days				
Planned	15-Jun-10	28-Feb-13	990	
Actual	15-Jun-10	17-Nov-15	1.982	
Delayed Completion			992	
CB&I Delay Responsibility			893	
		CB&I	Vendor	Total
Site CMT & Support (Costs/CD - w/o Scaffolding)				
Planned		517.411	41.741	559.151
Actual		763.970	37.847	801.817
Variance		246.560	(3.894)	$ 242.666
Scaffolding (Costs/CD)				
Planned		15.474	2.222	17.696
Actual		71.606	10.283	81.889
Variance		56.132	8.061	$ 64.193
Prolonged Schedule Impact				
Site CMT		$ 682.225.390	$ 33.797.182	716.022.572
Scaffolding		$ 63.944.142	$ 9.183.014	73.127.156
Total		$ 746.169.532	$ 42.980.196	$ 789.149.728
Excessive Indirects				
Excessive CMT		268.503.387	$ (4.240.289)	$ 264.263.099
Excessive Scaffolding		$ 61.128.009	$ 8.778.590	$ 69.906.599
Total Excessive Indirects		$ 329.631.396	$ 4.538.301	$ 334.169.697

1346. CB&I has not called the Tribunal's attention to an alternative calculation. The Tribunal sees no reason to put this daily rate in doubt, because it was developed by Reficar's experts to support its own claim[1475].

1347. The multiplication of this rate by the 188 days of delay for which Reficar was responsible after the Cut-Off Date results in a total of USD 157.1 million.

1348. In light of the above, the Tribunal finds that prolongation costs, caused by delay for which Reficar is responsible, and established at USD 157.1 million should be considered Excluded Costs.

I. Conclusion

1349. In sum, the Excluded Costs caused by Claimant's Responsibility Events amount to the following:

- Construction: USD 12.7 million
- Materials management: USD 9.9 million
- Craft labour productivity: USD 215.3 million

[1473] LI ER, para. 1260.
[1474] LI Attachment to JER 6 (Table 9.4-32 Rev. 1). The rate derives from summing up the daily rate for (i) CB&I's Site CMT & Support costs; and (ii) CB&I scaffolding costs.
[1475] CPHB, para. 158. Reficar uses Long International's calculation to support its claim for improper prolongation costs.

- Labour disruptions: USD 171 million
- Procurement: USD 237.9 million
- Prolongation costs: USD 157.1 million

1350. In total, the Excluded Costs caused by Claimant's Responsibility Events amount to USD 803.9 million.

3.3.4. CONCLUSION AS REGARDS EXCESS COSTS WHICH REFICAR IS ENTITLED TO CLAW BACK

1351. The Tribunal has found that the Reasonable Cost Benchmark amounts to USD 3,971 million and has also determined that the *prima facie* Excess Costs amount to USD 1,937.2 million.

1352. The Excluded Costs amount to USD 1,091.8 million (*i.e.*, Unpredictable Events USD 40.4 million, plus scope changes USD 247.5 million plus Claimant's Responsibility Events USD 803.9 million). This amount should be subtracted from the *prima facie* Excess Costs to determine the total amount that Reficar is entitled to claw back.

1353. Thus, by subtracting USD 1,091.8 million (Excluded Costs) from USD 1,937.2 million (Excess Costs), the Tribunal finds that the final amount of Excess Costs is of USD 845.4 million.

1354. In light of the above, the Tribunal finds that Reficar is entitled to claw-back USD 845.4 million as a consequence of CB&I's breach of the Cost Control Commitments under the EPC Contract.

3.3.5. UNSUBSTANTIATED PAYMENTS

1355. Reficar makes an additional claim for improper costs it calls "unsubstantiated advance payments" in a total amount of USD 140 million[1476].

1356. This claim requires some background information.

1357. Towards the end of the Project, the relationship between the Parties was tense. Reficar was upset about the cost overruns. CB&I submitted invoices for cost reimbursement which were rejected by Foster Wheeler as a consequence of the invoice verification process. The impasse was so severe that CB&I threatened abandoning the site[1477]. The Parties then negotiated and accepted two agreements on the payment of invoices:

[1476] This amount should be reduced to USD 84 million should the Tribunal grant Reficar its Improper EPC Costs claim under the Top-Down methodology. See Reficar's Request for Relief no. 53, CPHB, para. 532.
[1477] Ex. C-1307; Suarez CWS, para. 350; Ex. R-1849_09749, fn 3 at p. 2: "Reficar's accusations regarding alleged "coercion" presumes [sic] that CB&I had a contractual responsibility to finance the Work. CB&I has no such responsibility"; see also RPHB, para. 571: "By the end of 2013, Reficar's non-payment of a significant backlog of invoices threatened to disrupt the timing and progress of the Project because CB&I could no longer bear the burden of financing the cost of the Work" and RPHB, para. 570: "Preventing

- past invoices were subject to the "Memorandum of Agreement" ["**MOA**"], and

- future ones to the Project Invoicing Procedure ["**PIP**"][1478].

Payment of invoices by Reficar under the MOA and PIP would be made under a reservation of rights to later question whether the invoices had been properly submitted.

1358. Reficar now wishes to claw-back the amounts paid under the MOA and/or the PIP, in those cases where it considers that CB&I failed to properly substantiate its invoices[1479].

1359. The Tribunal considers that Reficar's request for the claw-back of unsubstantiated payments is moot, as any amounts requested will already have been awarded under the Improper EPC costs claim.

1360. The Bottom-Up approach involved looking at the totality[1480] of EPC costs actually paid by Reficar, regardless of the sufficiency (or insufficiency) of the underlying invoices and ancillary documentation. This implies that the Tribunal, in its analysis of Excess Costs for which Reficar should be reimbursed, has already reviewed, as to their reasonableness and propriety, all amounts which Reficar now claims as unsubstantiated advance payments.

1361. The necessary consequence is that the Tribunal must abstain from awarding to Reficar any further compensation for unsubstantiated advance payments. And Reficar itself has accepted this conclusion, when it argues that the unsubstantiated advance payments claim is additional to its claw-back claim:

> "As discussed below, Reficar then adds approximately US $84 million to the Top-Down amount to account for non-duplicative unsubstantiated advance payments, which result in the total of US$ 1,673.16 million". [Emphasis added]

1362. As a result, the Tribunal considers that the sums requested by Reficar under the unsubstantiated advance payments category have already been encompassed in the amounts for claw-back adjudicated under the Improper EPC costs claim and that Reficar is not entitled to any additional relief for these amounts.

CB&I's mirror relief

CB&I from "walking off the project" is not a form of mitigating damages. CB&I had a right under Colombian law to stop the Work if it was not getting paid".

[1478] ESOCC, para. 96; EDOCC, paras. 85 and 95.

[1479] Reficar's Request for Relief no. 53, CPHB, para. 532.

[1480] The Tribunal considers that the MOA and PIP amounts are included in the total amount of USD 5,908.2 million paid by Reficar: these amounts are referred to as "paid but not approved" by CB&I and "unsubstantiated advance payments" by Reficar. In addition, the table compiling all the EPC costs paid by Reficar under Ex. C-1181 (tab "ACTUAL A 31 DIC 2016) contains a deduction of USD 5,339,402 for "4.5 COMPENSACIONES MOA COLOMBIANA [...]", meaning that the total number accounts for set-off amounts, and thus, by extension, also the underlying payments under the MOA (and PIP).

1363. The Tribunal notes that CB&I has brought a mirror request for relief: for the Tribunal to issue a declaration that Reficar is not entitled to reclaim any of the amounts paid under the MOA and PIP[1481].

1364. CB&I's request for relief cannot succeed, because the Tribunal, by opting for the Bottom-Up methodology, has found that certain portions of the relief for unsubstantiated advance payments submitted by Reficar will necessarily have been addressed and wrapped up in the Improper EPC Costs claim.

VII.2.2. CB&I'S COUNTERCLAIM

1365. CB&I submits a counterclaim; it says that it issued invoices for EPC costs, which Reficar:

- unduly refused to pay in part or as a whole: approximately USD 48.6 million and COP 275 billion;
- settled by improperly off-setting their amounts: approximately USD 3.6 million and COP 125 billion;
- paid, but never approved: approximately USD 75 million and COP 274 billion.

1366. CB&I seeks relief under the Contract:

- a payment order for the first two categories and
- a declaration for the third category, stating that the amounts were correctly paid, to ensure that Reficar does not request a claw-back[1482];
- a declaration that Reficar breached the EPC Contract maliciously or with bad faith[1483].

1367. Finally, CB&I also claims that Reficar should reimburse the amounts it improperly drew on a letter of credit[1484].

Unjust enrichment

1368. CB&I not only requests relief under the Contract, but it submits an additional legal reasoning: it says that by refusing to pay the invoices Reficar became unjustly enriched, because it had the benefit of the goods and services, without paying any consideration[1485]. Both Parties' experts agree that under Colombian law the doctrine of unjust enrichment can only be applied when there is no contractual relationship between the parties[1486]; this subsidiary character of the general principle of unjust enrichment has been confirmed by Colombia's Supreme Court of Justice[1487]. Since

[1481] CB&I's Request for Relief "s.", ESOD, para. 1612.
[1482] RPHB, paras. 593, 595.
[1483] CB&I's Requests for Relief relief ee. [31], ESOD, para. 1612; and g(ii.), RPHB, para. 675.
[1484] RPHB, para. 594.
[1485] Respondents' ESOD request for relief k. [no. 11].
[1486] Solarte ER, paras. 1-17; Arrubla Second ER, paras. 237-244.
[1487] RL-407, pp. 24-25.

there is indeed a contractual relationship between CB&I and Reficar, the Tribunal will not pay further attention to CB&I's additional legal reasoning.

Declaratory relief

1369. The Tribunal need not decide on the declaratory relief with regard to the third category of claims (amounts paid but not approved), as this issue has been indirectly resolved by the Tribunal in its previous findings regarding Reficar's claim for improper EPC costs: any amount paid is contained in the total of USD 5,908.2 million disbursed by Reficar and the Tribunal has already determined that out of that amount, USD 5,062.8 million[1488] were proper EPC costs and the remaining USD 845.4 million were improper, because they were incurred in breach of the Cost Control Commitments – thus, the USD 75 million and COP 274 billion over which CB&I seeks declaratory relief have already been analysed jointly with the rest of paid costs, and decided by the Tribunal with prejudice (this also means that Reficar's claim for unsubstantiated advance payments[1489] has already been addressed in the Tribunal's analysis of the Improper EPC Costs claim).

* * *

1370. The Tribunal will address the unpaid invoices first (**1.**), then the allegedly improperly off-set ones (**2.**). Subsequently, the Tribunal will address CB&I's requests for declaratory relief on: the amounts seized under the performance letter of credit (**3.**) and the past and future drawing-upon the advance payment letter of credit ["**Advance Payment LoC**"] by Reficar (**4.**).

1. UNPAID INVOICES

1371. The experts have produced a joint excel spreadsheet analysing a sample of more than 1,000 invoices which have been partly or totally unpaid[1490]. These invoices pertain to 15 cost categories, labelled **A.** through **O.**[1491]:

	Item	Category of cost	Claimed amount	
			In USD	In COP
1.1.1	A.	Tanks and Spheres	*5.385.565*	*13,616,474,851*
	B.	Nomads		*28,256,049*
	C.	Third Party Invoices: Importations	*1.276.366*	
	D.	Third Party Invoices: Modularisation	*13.219.243*	

[1488] USD 3,971 million (Reasonable Cost Benchmark) + USD 1,091.8 million (Excluded Costs) = USD 5,062.8 million
[1489] Reficar's CPHB request for relief number 53.
[1490] Parties' joint communication C-227 & R-213 with Revised Expert Table Requested by Tribunal.
[1491] The Tribunal notes that CB&I's submissions refer to figures which do not match those discussed by the experts. Faced with this discrepancy, the Tribunal has given preference to the amounts claimed by CB&I in its written submissions (see break-down of counterclaimed amounts in tables at RPHB, para. 596; Respondents' Reply on Counterclaim, para. 8 and ESOCC, para. 146).

	E.	**Third Party Invoices: Subcontracts**	*302.902*	*66,892,081,378*
1.1.2	**F.**	**Third Party Invoices: Inspections**	*175.442*	
1.1.3	**G**	**Fansaro Group**	*860.237*	
1.1.4	**H.**	**Contractor's Fixed Fee and HSE Bonus**	*5.519.947* *1.173.617*	*54,866,665,602* *5,611,813,009*
1.1.5	**I**	**Letter of Credit Fees / Bond Premium**	*13.293.246*	*13.339.681,980*
1.1.6	**J.**	**Legal Fees and Related Costs**	*1.465.765*	*8,048.362,976*
1.1.7	**K.**	**Underpaid August 2015 PIP**	*127.878*	
1.1.8	**L.**	**Labour**	*3.504.472*	*51.875.652,967*
1.1.9	**M.**	**Taxes**		*37,963,069,637*
1.1.10	**N.**	**Expenses**	*1.756.868*	*8.578.407,539*
1.1.11	**O.**	**Mixed nature invoices submitted from August 1, 2017 to July 31, 2018**	*1.437.694,22*	*14.463.060,777*
		Total (Adjustment)[1492] **Total claimed**	*49,499,242* *(870,038)* *48,629,204*	*275,283,526,765* *(1,091,705)* *275,282,435,060*

1372. CB&I's basic position is that these invoices reflect reasonable and properly incurred EPC costs and that they were submitted with all supportive documentation needed to verify the correctness of each invoice; thus, the invoices should be reimbursed by Reficar. Reficar accepts that a small number of the invoices were correctly submitted, but rejects the reasonableness and propriety of any amounts claimed.

1373. The Tribunal recalls that in the section on Improper EPC Costs, the process for ascertaining Contract-compliant costs involved a scrutiny of the formalities of each invoice (carried out by Foster Wheeler, and which is not contested), followed by the Tribunal's assessment of what amounts were reasonable and proper. The situation is different for the pool of unpaid invoices: these invoices were never paid by Reficar and are now claimed by CB&I. But a similar approach must be taken to ascertain if they should be paid: whether they fulfil the formal requirements and whether the underlying costs were reasonable and proper.

1374. The Arbitral Tribunal will first address the reasonableness and propriety arguments (**1.1**) and then deal with the document verification issue (**1.2**).

1.1. REASONABLENESS AND PROPRIETY

[1492] For Onshore:
Reficar paid invoices 58901723, 58901723 RM, and 58901899 under the EPC Payment Process and under the MOA/PIP. Reficar paid the gross amount for invoice 58901994, instead of the amount net of withholding taxes. The withholding tax calculated by Reficar on the MOA was too low, resulting in an overpayment, which is now deducted. See Wrights Updated ER, Table 1 at pdf p. 12, fn [F].
For Offshore:
The adjustment is made for the decrease in the amounts claimed by CB&I in the ESOCC (see "Subtotal" for "Unpaid" ONSHORE AMOUNTS, COP 260,820,465,988 in table at para. 146) and the Respondents' Reply on Counterclaim (see "Unpaid Invoices (through 31 July 2017)" of COP 260,819,374,283), for which the Tribunal has not found any explanation in CB&I's submissions.

1375. CB&I is claiming USD 48.6 million and COP 275 billion in EPC costs that were incurred, invoiced and never paid[1493].

1376. Were these costs reasonable and were they properly incurred?

1377. It is possible to give a preliminary answer to these questions.

1378. The Tribunal has already established that USD 3,971 million was a Reasonable Benchmark for the EPC costs and that any costs beyond that amount must be considered unreasonable and improperly incurred Excess Costs, which Reficar should not bear. The principle is applicable both to costs which Reficar has already paid, and to costs that are still pending payment.

1379. The above principle is, however, not absolute – the Tribunal has allowed for some exceptions (the so-called Excluded Costs) and accepted that, if post-Cut-Off-Date EPC costs were either:

- unforeseeable as of the Cut-Off Date,
- the consequence of changes in the scope of the works to be performed, or
- caused by Reficar's fault or lack of diligence,

Reficar was not entitled to claw-back.

1380. The same approach is applicable to CB&I's counterclaim for unpaid invoices: the Tribunal will, thus, analyse whether these additional EPC costs are related to any of the three exceptions. If not, the Tribunal will assume that the costs were known at the time of the Representation Forecast and are included in the USD 3,971 million Reasonable Benchmark.

1381. The difficulty in carrying out this task lies with the scarcity of input from the Parties. CB&I has argued that reasonableness is sufficiently proven if the costs relate to the Project[1494]; but the Tribunal has already determined that such approach is fundamentally flawed: costs will not be reasonable and proper simply because they arose during the performance of the works – reimbursement of costs still requires that CB&I complied with its Cost Control Commitments.

1382. The Tribunal has, nonetheless, analysed each of the 15 categories (**A.** through **O.**) of additional EPC costs, according to the breakdown provided by both experts in the joint spreadsheet referred to in para. 1371 *supra*, to determine the reasonableness and propriety.

[1493] Respondents' Reply on Counterclaim, Table "Amounts Claimed Under the Offshore Contract (USD) at bottom of pdf p. 5 and Table "Amounts Claimed Under the Onshore Contract (COP)" at top of pdf p. 6.
[1494] See e.g., Mr. Hackett's analysis on the reasonableness of discrete invoices under JER 10 Quantitative.

1.1.1. CATEGORIES A., B., C., D. AND E.

1383. The Tribunal has already analysed the reasonableness and propriety of certain categories of costs [Tanks and Spheres (**A.**)[1495], Nomads (**B.**), Importation (**C.**)[1496], Modularisation (**D.**), and Subcontracts (**E.**)] in the section dedicated to Excluded Costs. The Tribunal's findings were that the categories Tanks and Spheres, Nomads, and Importation costs indeed gave rise to Excluded Costs, while the categories Modularisation and Subcontracts did not[1497].

1384. CB&I is claiming the following amounts under the categories that in the Tribunal's findings constitute Excluded Costs[1498]:

- Tanks and Spheres: USD 5.38 million and COP 13.6 billion;
- Nomads: COP 28.3 million;
- Importation costs: USD 1,299,366.

1385. These amounts *prima facie*, and subject to the verification of the formal invoicing requirements, constitute reasonable and properly incurred costs, for which CB&I is entitled to reimbursement.

1.1.2. CATEGORY F.: INSPECTIONS

1386. CB&I engaged certain inspection companies, with which it had worked in the past, to perform inspections services on the Project[1499].

1387. In principle, the Contract foresees that inspection costs should be reimbursed[1500]. The question, thus, is whether by the time CB&I presented the Representation Forecast it did include (or should have included) these costs, as being foreseeable at that time.

1388. The Tribunal notes that the Representation Forecast did in fact include the cost of inspection of certain elements, such as boilers and refurbished equipment from the Big West refinery[1501]. Furthermore, the invoices seem to relate to ordinary inspections – the experts do not point to any extraordinary circumstance.

1389. If CB&I expressly included some inspection costs in the Representation Forecast, there is no reason why it should not have included the costs of all inspections. The

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[1495] See analysis of WNOC 1024 in para. 1077 *supra*.
[1496] Importation and Nomads refer to procured equipment; since the experts have not referred to any extraordinary circumstances surrounding those costs, the Tribunal will assume that the decision on Procurement applies to them.
[1497] See Section VII.2.1.3.3 *supra*.
[1498] See table in para. *supra*.
[1499] JER-10, Offshore Inspections.
[1500] Section IV, Art. 5.8, "Billable" category; JX-003, pdf p. 10; JX-005, pdf p. 8.
[1501] Ex. R-1851_057_00017, Tab "Summary Cost Slides", Row "Source Inspection Services", Tab "Engineering", Row "Inspection Services", Tab "Construction", Rows "Consulting/Inspection/Surveys", "Safety Inspection & Training", "Inspection and Maintenance of Fire Extinguisher" "Inspection (Site)" et.al.

Tribunal thus finds that these costs are not reasonable and proper and should not be paid by Reficar.

1.1.3. CATEGORY G.: FANSARO GROUP

1390. The first step in the invoice payment process was the verification carried out by Foster Wheeler. Foster Wheeler rejected a number of invoices because, allegedly, they lacked proper justification.

1391. CB&I hired the Fansaro Group, a consultancy firm, to address Foster Wheeler's rejections[1502].

1392. The Tribunal is not persuaded that CB&I was contractually entitled to recover this type of costs from Reficar. Under Section IV of the Contract[1503] there are billable and non-billable personnel costs. "Corporate accounting" and "legal for normal corporate company business matters" constitute non-billable costs[1504]. The costs incurred by a consultancy firm hired by CB&I to improve the manner in which the documents supporting invoices were submitted, falls within the category of non-billable costs.

1.1.4. CATEGORY H.: FIXED FEES AND HSE BONUS

1393. Pursuant to the remuneration scheme provided for in the Contract, CB&I was entitled, among others, to a:

- Progress fee: an aggregate of USD 44.1 million would be invoiced in monthly instalments, based on project progress achievement[1505] – all CB&I's progress fee invoices were paid, except for the last USD 7,447 and COP 23,580,251,352 invoice[1506], and

- Mechanical Completion fee: USD 5,512,500 and COP 31,286,414,250 upon Mechanical Completion of all Units[1507] – Reficar refused to pay this fee.

1394. CB&I claims payment of USD 5,519,947 and COP 54,866,665,602 for these fees.

1395. The Representation Forecast that set the Reasonable Benchmark at USD 3,971 million already included the Progress and the Mechanical Completion fees. Consequently, CB&I is not entitled to any additional compensation (see para. 1281 *supra*).

Health, Safety and Environment bonus

1396. CB&I also requests payment of the Health, Safety and Environment bonus. This bonus is to be found in Section IV, Art. 3 and TC 58.13 of the Contract[1508]: CB&I was entitled to USD 4 million per year up to the third year of Contract and to an

[1502] JER-10, Offshore Fansaro Group.
[1503] Section IV, Art. 5.8; JX-003, pp. 9-10; JX-005, pp. 8-9.
[1504] Section IV, Art. 5.8; JX-003, p. 10; JX-005, p. 9.
[1505] Section IV, Art. 2.4 of the Offshore Contract.
[1506] JER-10, Offshore and Onshore Fixed Fee.
[1507] Section IV, Art. 2.5 of the Offshore Contract
[1508] JER-10, Offshore and Onshore HSE Bonus.

additional USD 1.5 million for each subsequent year, provided that it was able to maintain a low frequency and severity of accidents[1509].

1397. The unpaid invoices claimed relate to the 2011 the Health, Safety and Environment bonus in an amount of USD 1,173,617[1510] and COP 5,611,813,009[1511].

1398. The case is similar to that of the Progress and Mechanical Completion fees. The Representation Forecast also foresaw USD 3,433,200 (Offshore Contract) plus USD 566,800 (Onshore Contract) for the "safety bonus", as the "earned" portions as of January 2012[1512]. The Representation Forecast must have already included the bonus for 2011, and consequently CB&I is not entitled to additional compensation.

1.1.5. CATEGORY I.: LETTER OF CREDIT FEES AND ONSHORE BOND PREMIUMS

1399. TC 75 of the Contract requires CB&I to procure two on-demand letters of credit and a bond for the benefit of Reficar:

- A USD 70 million performance letter of credit, securing CB&I's obligations and liabilities under the EPC Contract, in effect until 28 days after the end of the Defects Correction Period;

- A USD 25 million advance payment letter of credit, securing the money Reficar pays CB&I in advance of performing obligations, until the liquidation of the agreement; this amount was amended during the Project, eventually reaching USD 95 million;

- A performance bond with a duration until 28 days after the end of the liquidation of the agreement.

1400. The performance letter of credit was drawn down entirely on March 31, 2016. As regards the advance payment letter of credit, Reficar attempted to draw USD 95 million on March 9, 2016, but was preliminarily enjoined from doing so by Court order[1513]. The Parties then agreed that Reficar would defer the draw down until conclusion of the arbitration, and in return CB&I would maintain the letter of credit alive until that time[1514].

1401. As of June 28, 2019 (the date of the most recent expert reports for CB&I[1515]) CB&I had incurred USD 13,293,246 in fees for the two letters of credit[1516], although only

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[1509] Section IV, Arts. 3.2.2 and 3.2.3; JX-003, p. 4; JX-005, p. 4:
3.2.2 The "HSE Bonus" means an amount up to thirteen million five hundred thousand Dollars (US$13,500,000) to be paid out of the Incentive Pool.
3.2.3 The "Annual HSE Bonus" means an amount of up to four million Dollars (US$4,000,000) for each of the first three Contract Years and an amount of up to one million five hundred thousand Dollars (US$I,500,000) for any remaining period.
[1510] JER-10, Offshore HSE Bonus.
[1511] JER-10, Onshore HSE Bonus.
[1512] Ex. R-1851_057_00017, tab "Fee", Row "Safety Bonus".
[1513] Ex. R-0358, pdf p. 2.
[1514] Ex. R-0358, paras. 2 and 3 at pdf pp. 3-4.
[1515] Hackett Counterclaim ER II; Wright Updated ER.
[1516] Hackett Counterclaim ER II, Section 9.0; Wright Updated ER, Section VI.C.9 at pdf pp. 38-39.

50% of this amount has been invoiced[1517]: in late 2012/early 2013 the Parties negotiated a memorandum of understanding, in which Reficar accepted to pay 50% of the letter of credit fees in exchange for CB&I reducing another claim[1518]. Although it is undisputed that the Parties never signed the memorandum of understanding, CB&I's invoices have been reduced as if the memorandum of understanding had entered into force.

1402. CB&I also claims reimbursement of the costs arising out of the performance bond, in an amount of COP 13,339,681,980[1519].

1403. Reficar submits that CB&I is responsible for the fees associated with the letters of credit, because these costs are not recoverable under the terms of the Contract. Reficar's expert refers to Letter VP-CBI 14017-5945-16 dated August 23, 2016[1520] where it was stated that these letters of credit provide security to Reficar in the event that CB&I fails to satisfy its obligations under the Contract. As a result, it says that CB&I is responsible for all associated banking fees. The terms and intent of the Contract would be contradicted if Reficar paid these fees[1521]. And, subsidiarily, Reficar submits that only USD 12,384,092 are supported – USD 909,154[1522] are duplicative billings and/or could not be confirmed[1523].

Discussion

1404. The Tribunal has to decide, first, whether the draft memorandum of understanding is a sufficient basis to accept the propriety and reasonableness of these costs. The document was ultimately not entered into and consequently these costs must be decided applying the terms of the Contract.

1405. Section IV, Art. 5.8 includes "Bonds, Insurance and Letters of Credit" as billable expenses. The Contract thus contradicts Reficar's position that these costs were not recoverable.

1406. The remaining question is whether, by the time CB&I presented the Representation Forecast, it did include (or should have included) these costs because they were foreseeable at that time.

1407. The Tribunal is of the opinion that the fees for the letters of credit and for the performance bond should have been foreseen by CB&I in the Representation Forecast, as it knew that these guarantees implied costs which would arise and which Reficar was obliged to cover.

[1517] Wright Updated ER, pdf p. 39: "Although CB&I invoiced for 50% of the costs incurred for letter of credit fees, CB&I incurred USD $13,293,246 to maintain the letters of credit".
[1518] Ex. C-1830.
[1519] Hackett Counterclaim ER II, Section 21.
[1520] Letter VP-CBI 14017-5945-16 dated August 23, 2016; Ex. R-1849_14810, p. 2, referenced in Deloitte ER, pdf p. 85.
[1521] Ex. R-1849_14810, p. 2
[1522] The table at the end of Section 7.3 of Deloitte ER provides for the number USD 534,154 as unsupported costs but the Tribunal accepts that the correct number is reflected in the body of the text of the ER, which is USD 909,154 at Deloitte ER, pdf p. 83.
[1523] Deloitte ER, Section 7.3 at pdf p. 86.

1408. The only exception to this rule is the extended duration of the advance payment letter of credit. The Parties' agreement of March 2016 to extend the letter of credit until after the conclusion of this arbitration could not have been foreseen at the time of the Representation Forecast[1524].

1409. This means that advance payment letter of credit fees, accruing after March 2016, could not have been foreseen at the time of the Representation Forecast. Of the various invoices now submitted for payment, 58902977 covers the period of 2nd through 4th quarter of 2016 and 1st quarter of 2017 for an amount of USD 602,180.

1410. The Tribunal notes that under the category "Offshore 17-18 Invs", which compiles unpaid invoices of mixed nature, CB&I is seeking reimbursement of two further invoices[1525]:

Invoice no.	Amount in USD
58903013	394,701
58903055	207,872

1411. Upon examination of the supporting material, the Tribunal finds that the first of these invoices refers to the fees incurred in the 2nd quarter of 2016 and 2nd and 4th quarter of 2017. The amount attributable to the 2nd quarter of 2016, therefore, overlaps with invoice 58902977. The extent of the overlap is easy to determine as the record has an invoice just for 2nd quarter 2016[1526] in an amount of USD 150,211 – which Reficar correctly says should not be counted twice. The net value of invoice 58903013 is, thus, USD 244,489.

1412. As to the second invoice (58903055), the Tribunal has searched in the invoice log and the folder containing all invoices but has been unable to locate it.

1413. In sum, the Tribunal accepts that CB&I's reasonable invoiced costs related to the advance payment letter of credit amount to USD 846,669[1527].

1.1.6. CATEGORY J.: LEGAL FEES

1414. As explained by the experts[1528], during the Project CB&I engaged certain external counsel to address employment, union issues and disputes with Vendors, suppliers and subcontractors. For Offshore legal services, CB&I mainly relied on Holland & Knight LLP and Baker McKenzie[1529]; the Onshore legal costs primarily include

[1524] Ex. R-0358.
[1525] JER-10, Offshore 17-18 Invs.
[1526] Invoice no. 5802903; Ex. R-0444.
[1527] USD 602,180 + USD 244,489.
[1528] JER-10, Offshore Legal Fees; Deloitte ER, Section 8.7.
[1529] JER-10, Offshore Legal Fees.

fees from Baker McKenzie, *VT Servicios Legales* and *Alberto Jubiz & Abogados Asociados*[1530].

1415. CB&I claims reimbursement of the following amounts related to the abovementioned legal services[1531]:

- USD 1,465,765 for Onshore invoices, and
- COP 8,084,362,976 for Offshore invoices.

1416. According to CB&I, these legal costs are reimbursable under Art. 5.8 of Section IV of the Contract. The Tribunal notes that Section IV is related to employment rates[1532]:

> **5. EMPLOYEE LABOR GRADE RATES**
>
> **5.1 Not Used**
>
> **5.2 Contractor Expat Rates**

and so does Art. 5.8 itself, as it lists different billable and non-billable items related to "**Personnel** Categories"[1533]:

> 5.8 Billable/Non Billable Personnel Categories
>
> Billable
>
> - Project Management (Directors and Managers)
> - Project Engineering

1417. The billable expenses under Art. 5.8 only include costs of personnel directly engaged in providing legal services related to the Works, but it does not cover costs arising from CB&I's decision to hire external counsel. Consequently, the expenses for external counsel claimed by CB&I in this category are not billable under the provision it relied upon (and thus, not reimbursable).

1418. In any event, two of the three categories of invoices claimed by CB&I seem to reflect costs incurred in providing routine legal services regarding labour issues after the Cut-Off Date. This type of routine legal costs should have been included in the Reasonable Cost Benchmark, as decided by the Tribunal with regard to Labour costs under Section VII.2.1.3.3.3.F *supra*.

1.1.7. CATEGORY K.: UNPAID AMOUNT PIP

1419. CB&I issued invoice PIP08182015 for USD 1,315,596[1534].

[1530] Deloitte ER, Section 8.7.
[1531] ESOCC, para. 146.
[1532] Section IV, Art. 5, pdf p. 6; JX-003, pdf p. 6; JX-005, pdf p. 6.
[1533] Section IV, Art. 5.8, pdf p. 6; JX-003, pdf p. 9; JX-005, pdf p. 8. Emphasis added by the Tribunal.
[1534] See discussion at JER 10 – Qualitative, Topic 11.

1420. CB&I claims that Reficar did not pay the invoice in full, leaving USD 127,827 unsettled[1535]. The evidence of this underpayment is, according to Mr. Wright, an email from October 7, 2015 from CB&I attaching an excel document[1536]. Deloitte, however, has reviewed Reficar's SAP records and finds that the total amount of USD 1,315,596 is credited as paid[1537].

1421. The discussion is, thus, not whether the amounts claimed are reasonable, but whether they have actually been paid. The Tribunal tends to side with Reficar: if its accounting software shows that invoice PIP08182015 has been paid in full, it is sufficient evidence to accept that the debt is settled.

1.1.8. CATEGORY L.: LABOUR

1422. This category deals with Offshore labour costs, such as management. administration and engineering[1538]; and Onshore costs for the labour of craft employees[1539].

1423. Labour costs is the major costs category in the Representation Forecast, as CB&I's principal task was to perform works through its workers. So, when CB&I represented that the total costs would be USD 3,971 million, it must have included the totality of labour costs.

1424. There is no indication by the experts that the labour costs now claimed were the consequence of an extraordinary cause, which could not have been foreseeable at the time of the Representation Forecast.

1425. The Tribunal, thus, sees no reason to grant CB&I additional compensation for labour costs.

1.1.9. CATEGORY M.: ONSHORE TAXES

1426. The invoices claimed cover amounts for Colombian taxes such as *GMF*, *ICA Industrial y Comercio* and *Sobretasa Bomberil*[1540].

1427. The discussion revolves around whether taxes are reimbursable costs.

1428. The Tribunal sides with Reficar in that they are not, according to TC 72.1[1541]:

> "The Contractor represents that it is aware of the tax regulations applicable to this Agreement, including, but not limited to, withholding in respect of income and value added tax ("VAT"), and any tax, or payment, direct or indirect, of national, departmental, or municipal nature, arising out of the execution, performance, or payment under this Agreement, which shall be assumed and paid exclusively by the Contractor".

[1535] JER-10, Quantitative, Offshore PIP Tab.
[1536] JER-10, Quantitative, Offshore PIP Tab.
[1537] JER-10, Quantitative, Offshore PIP Tab.
[1538] JER-10, Quantitative, Offshore Labour Tab.
[1539] JER-10, Quantitative, Onshore Labour Tab.
[1540] JER-10, Qualitative, Onshore Taxes, Topic 24.
[1541] JX-002, p. 259; JX-004, pp. 235-236.

1429. Furthermore Section IV, Appendix II, Clause 5.8 refers to "corporate accounting, tax" being non-billable[1542].

1430. The only exception to this rule seems to be VAT (TC 72.3), but here CB&I is seeking reimbursement of taxes different from VAT.

1.1.10. CATEGORY N.: EXPENSES

1431. CB&I seeks the reimbursement of employee travel expenses and consulting services in the Offshore Contract[1543] and equipment rental, legal support, travel expenses and other miscellaneous expenses under the Onshore Contract[1544].

1432. The question here, again, is not whether CB&I was entitled to these expenses, but rather whether they were included (or should have been included) in the Representation Forecast.

1433. The Tribunal has reviewed the description of the expenses provided by the experts and finds that these costs mainly arose in the ordinary course of construction activity; these types of expenses had already been incurred before CB&I issued the Representation Forecast[1545]. There is no indication that these expenses were caused by extraordinary circumstances, unforeseeable at the time CB&I made the Representation Forecast. Consequently, no additional compensation to CB&I is warranted.

1.1.11. CATEGORY O.: MIXED NATURE

1434. This is a category of 250 invoices of mixed nature submitted between August 1, 2017 and July 31, 2018 (which appears in the experts' spreadsheet under the heading "Offshore 17-18 Invs"/"Onshore 17-18 Invs"). The invoices relate to labour, expenses, letter of credit fees, subcontracts, legal support and importations[1546] and have been dealt with in the respective previous sections.

1.2. DOCUMENT VERIFICATION

1435. According to the Tribunal's findings in the previous section, the following invoiced amounts were reasonable costs and should therefore, *prima facie*, be paid by Reficar:

- Tanks and Spheres: USD 5,385,565 and COP 13,616,474,851 (**1.2.1.**);
- Importations: USD 1,299,366 (**1.2.2.**);
- Nomads: COP 28,256,049 (**1.2.3.**); and
- Advance payment letter of credit fee: USD 846,669 (**1.2.4.**).

[1542] Section IV, Art. 5.8; JX-003, p. 10; JX-005, p. 9.
[1543] JER-10, Offshore Expenses.
[1544] JER-10, Onshore Expenses.
[1545] Ex. R-1851_057_00017, Summary Cost Slides.
[1546] JER-10, Offshore and Onshore 17-18 Invs.

1436. To make a final determination on whether the amounts are recoverable, as CB&I claims, the Tribunal must verify that the invoices were properly submitted from a formal point of view.

1437. The Contract contains no specific provisions on this issue. But during the life of the Contract, Foster Wheeler (Reficar's consultant) developed a system for the review of invoices from a formal point of view, which was acquiesced by CB&I – as it addressed any of Foster Wheeler's shortcomings and continued to submit invoices for Foster Wheeler's review.

1.2.1. TANKS AND SPHERES

1438. Based on his review of the Tanks and Spheres invoice category, CB&I's expert, Mr. Wright states that CB&I's invoices for USD 5,385,565 and COP 13,616,474,851 include appropriate supporting documentation.

1439. Deloitte says that it performed an analysis and found that the invoices submitted by CB&I did not contain adequate documentation to support the costs being claimed. Foster Wheeler had rejected these costs because of a lack of an authorized Change Order.

1440. The amount of USD 5,385,565 derives from invoice 58902081. The Tribunal has considered the documents attached to this invoice and finds that there is no support there for the figure claimed and no further documents have been cited to support that claim[1547]. Hence, Reficar was correct when it rejected the invoice for lack of proper documentation.

1441. The situation regarding the Onshore disputed invoice is similar. CB&I only claims reimbursement of one invoice 3239A, in an amount of COP 13,616,474,851[1548]. This invoice purports to relate to Change Order 491, for which no evidence has been cited to support that it or the NOCs had actually been approved by Reficar. In those circumstances, the Tribunal cannot award any sum to CB&I.

1442. Accordingly, no sums are awarded in respect of the Onshore Tanks and Spheres claim.

1.2.2. IMPORTATIONS

1443. The Tribunal has found that Importations cost in an amount of USD 1,299,366 were *prima facie* reasonable and proper.

1444. The Tribunal has reviewed the excel sheet provided by the experts[1549], which analyses the invoices relating to Importations and notes that only three Importation invoices remain actually unpaid: 58902820, 58902829 and 58902839, for USD 68,270, USD 20,496 and USD 78,495, respectively.

1445. The Tribunal has not been given reasons why CB&I is now claiming USD 1,299,366 as unpaid, which is significantly more than what both experts accept.

[1547] Ex. R-0444, Offshore, 58902081 – Tanks and Spheres.
[1548] Ex. R-0444, Onshore, 3239.
[1549] ESOCC, Table "Offshore Amounts" at pdf p. 42.

Furthermore, USD 1.3 million (and the precise figure of USD 1,276,266) are unsupported amounts. This figure appears for the first time in para. 190 of Respondents' ESOCC[1550], and just four paragraphs earlier, in para. 186, the relevant figure was USD 1,978,579[1551]. Regardless of these differences, CB&I concludes the Importations section in its ESOCC by stating that it is "entitled to reimbursement of USD 1,276,366"[1552]. This is the figure also used by CB&I to arrive to the final claimed amount for unpaid invoices[1553]. Accordingly, the Tribunal will use this figure in its analysis hereafter.

1446. Be that as it may, the experts say that only three invoices remained unpaid, and since this counterclaim deals with the reimbursement of unpaid invoices, the Tribunal will, thus, limit its analysis to the three unpaid invoices.

A. Invoice 58902820

1447. Reficar accepted that the invoice was correctly submitted, but rejected it nonetheless, pursuant to TC 26.1.6 of the Onshore Contract[1554]:

> "All contracts relating to the supply of consumables and tools for the Work within Colombia will be entered into by the Contractor in its own name, provided the value of such contracts is equal to or less than fifty million Colombian Pesos (COP50,000,000). All such contracts with a value in excess of fifty million Colombian Pesos (COP50,000,000) relating to the supply of consumables and tools for Work within Colombia will be entered into by the Owner. It is not permitted to split any such contract with a value greater than fifty million Colombian Pesos (COP50,000,000) so that the resulting contracts fall within this exception). In respect of the contracts referred to in this TC26.1.6, the Contractor will be responsible for the satisfaction of any relevant warranties".

1448. Reficar says that the amount invoiced exceeded USD 50,000 and the claim should, therefore be dismissed[1555].

1449. The Tribunal does not agree: Reficar is availing itself of an excuse provided in the Onshore Contract which is not applicable to the Offshore Contract[1556]:

> 26.1.6 Not Used.

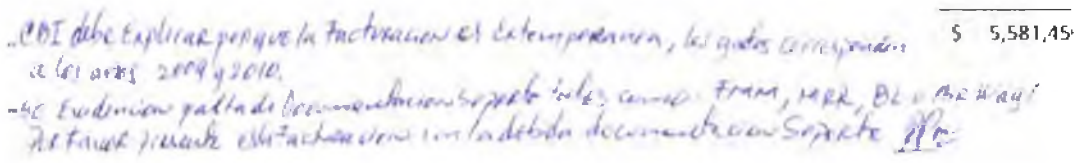
1450. The Tribunal, therefore, considers that the invoiced amount of USD 68,270 was correctly submitted.

[1550] ESOCC, para. 190; "Thus, CB&I is entitled to reimbursement of USD 1,276,366 [...]".
[1551] ESOCC, para. 186: "Of the total amounts unpaid of the invoice category "Importations" (USD 1,978,579.70) [...]".
[1552] ESOCC, para. 190.
[1553] ESOCC, para. 146.
[1554] JX-002, p. 202.
[1555] JER-10, Qualitative, Topic 16, Offshore Importations.
[1556] JX-004, p. 185.

B. Invoice 58902829

1451. The invoice is dated May 23, 2016 and refers to imported materials such as dictionaries, printers, cables and computing equipment.

1452. The reasons for Reficar's rejection are that, despite express requirements, CB&I failed to provide explanations and supporting documents[1557]:



In this handwritten note, FMM, MRR and BL have the following meaning[1558]:

- the *Formulario de Movimiento de Mercancias* ["**FMM**"] a Colombia-specific certificate confirming that the goods had entered the Free Trade Zone;

- the Material Receiving Report ["**MRR**"], a description of the goods and quantities;

- the Bill of Lading ["**BL**"], a document necessary for the processing a freight shipment.

1453. Reficar thus rejected the invoice because it is dated May 23, 2016, but refers to freight invoices in 2010 and because important supporting documents were missing.

1454. CB&I not only failed to provide explanations for the delayed submission and to produce the documents evidencing shipment, but it also acknowledged that some of the invoices which were claimed under invoice 58902829 were missing in CB&I's accounting system[1559]:

> The following invoices are not in CB&I's accounting system. At this time, we are making attempts to locate hardcopies.

1455. In view of the above, the Tribunal finds that Reficar was correct in rejecting invoice 58902829.

[1557] Ex. R-0444, Offshore, 58902829 Geodis Wilson USA, Inc, 20160525-Transmittal Inv 58902829. Translation:
- CBI must explain why the invoice is extemporaneous; the expenses relate to years 2009 and 2010.
- it becomes evident that supporting documents are missing, such as: FMM (*goods movement forms*), MRR (*material receiving report*), BL (*bill of lading*) or AirWayBill.
Please produce the invoice with adequate supporting documents

[1558] Deloitte ER, pdf p. 71; EDOCC, para. 173.

[1559] Ex. R-0444, Offshore, 58902829 Geodis Wilson USA, Inc, 20160523-Support Doc Inv 58902829_1.

C. Invoice 58902839

1456. This invoice is dated April 25, 2016 and incorporates four invoices for insulation, which presented inconsistencies and lacked supporting documentation; more specifically[1560]:

- Invoice 37248281-SF: BL and FMM were missing; also the quantities recorded in the invoice were higher than the quantities established in purchase order no. 1029674 (FPO-INS048-INS049) and there was a difference between the unit prices established in purchase order no. 1029674 (FPO-INS048-INS049) and the unit prices registered in the invoice.

- Invoice 87039682-SE: the purchase order did not include freight;

- Invoice 37249506-SF: no FMM;

- Invoice 37249667-SF: no FMM.

1457. Reficar requested further input by CB&I, but none was provided[1561]. In this situation, the Tribunal sides with Reficar in that the rejection was correct.

1.2.3. NOMADS

1458. Deloitte analysed the invoices and found that CB&I provided adequate supporting documentation for the sum claimed of COP 28,256,049 in disputed costs and that Foster Wheeler approved these costs. Deloitte therefore accepts that this sum is due[1562].

1459. Since both Parties' experts agree, the Tribunal allows COP 28,256,049 for Nomads.

1.2.4. ADVANCE PAYMENT LOC FEE

1460. The Tribunal has already found that that CB&I's reasonable invoiced costs related to the Advance Payment LoC amount to USD 846,669[1563]. This sum derives from the following invoices:

Invoice no.	Period covered	Amount in USD
58902977	2nd – 4th quarter 2016 1st quarter 2017	602,179.53

[1560] Ex. R-0444, Offshore, 58902839 Specialty Products and Insulation Company, 20160914-Obj Ltr Inv 58902839.
[1561] The Tribunal's findings are based on the information available in Ex. R-0444, containing all the invoices and underlying support and communications.
[1562] JER 10, Qualitative, Topic 22. Also, JER 10 Quantitative, Onshore Nomads Tab.
[1563] USD 602,180 + USD 244,489.

58903013	2nd quarter 2016	(-150,211.81)
	2nd and 4th quarter of 2017	394,701.38

1461. The Tribunal has looked into the documents supporting each invoice and finds them to be sufficient. There is ample material evidencing the amounts incurred by CB&I as costs for the maintenance of the advance payment letter of credit.

1462. In sum, CB&I is awarded USD 846,669[1564] for the invoiced costs of the advance payment letter of credit.

1.2.5. CONCLUSION

1463. In sum, the reasonable and proper, and properly substantiated unpaid invoices are amount to the following:

- Importations: USD 68,270[1565]
- Nomads: COP 28,256,049[1566]
- Advance Payment LoC Fee: USD 846,669[1567]

1464. In total, USD 914,939[1568] and COP 28,256,049[1569] constitute reasonable and proper costs, which have been duly invoiced with all supporting documents, and which Reficar is obliged to pay to CB&I.

1465. The detailed analysis of the invoices which actually remain unpaid, and the small amount which Reficar has been found to owe to CB&I, support the dismissal of CB&I's additional claim that, through withholding the payments for these invoices, Reficar had acted intentionally, maliciously, in an abuse of right or bad faith.

2. SET-OFF INVOICES

1466. Some background information is needed to understand why Reficar performed a set-off of certain invoiced amounts.

1467. *Pro memoria*, towards 2014 the relationship between the Parties became so strained that CB&I threatened to abandon the Works[1570]. To alleviate the tensions, the

[1564] USD 602,179.53 + 394,701.38 - 150,211.81 = USD 846,669.10.
[1565] See para. 1450 *supra*.
[1566] See para. 1459 *supra*.
[1567] See para. 1462 *supra*.
[1568] USD 68,270 (Importations) + USD 846,669 (advance letter of credit fees).
[1569] For Nomads.
[1570] Ex. C-1307: Suarez CWS, para. 350; Ex. R-1849_09749, fn 3 at p. 2: "Reficar's accusations regarding alleged "coercion" presumes [sic] that CB&I had a contractual responsibility to finance the Work. CB&I has no such responsibility"; see also RPHB, para. 571: "By the end of 2013, Reficar's non-payment of a significant backlog of invoices threatened to disrupt the timing and progress of the Project because CB&I could no longer bear the burden of financing the cost of the Work" and RPHB, para. 570: "Preventing CB&I from "walking off the project" is not a form of mitigating damages. CB&I had a right under Colombian law to stop the Work if it was not getting paid".

Parties signed two agreements on the payment of invoices: past invoices were subject to the MOA and future ones to the PIP[1571]. Payment of invoices by Reficar under these agreements would be made under a reservation of rights to later question whether the invoices were properly submitted. Additionally, Reficar reserved the right to set-off amounts for invoices provisionally paid and later contested, with those of later accepted invoices.

1468. This is exactly what happened: Reficar paid, but later challenged, invoices in an amount of USD 3.6 million and COP 125 billion, for alleged failure by CB&I to comply with the formal verification requirements, and so it set-off these amounts against properly submitted invoices.

Preliminary defenses

1469. The first issue to determine is whether this set-off was possible under the agreed terms. CB&I argues that Reficar was not entitled to make any set-offs because[1572]:

- Reficar failed to negotiate in good faith under the MOA and PIP (i.): and
- Reficar's president failed to participate in the meetings required under the PIP (ii.).

1470. (i.) Pursuant to the MOA, Reficar had an absolute right of set-off after a certain period had elapsed[1573]:

> "7. Reficar shall have the right to offset any disputed amounts from CB&I's next invoice or against any other amount which may be owed to CB&I, in the following events: [...] (ii) if six (6) months have elapsed since the date of signature of this Agreement and disputes regarding Invoices still remain for whatever reason, unless the parties agree in writing to extend this six (6) months period".
>
> [This six-month period was extended to 11 months under an amendment[1574]]

1471. Similar provisions, allowing Reficar to offset disputed amounts after the expiry of a period of time, may be found under the PIP[1575]:

> 5. "[...] REFICAR shall have the right to offset any disputed amount that remains unresolved after the expiry of the Seventy Five (75) Days, from CB&I's next invoice or against any other amount which may be owed to CB&I and pay remaining amounts".

1472. Under these agreements, the off-setting of invoices thus did not require a prior period of negotiations between the parties[1576]. And, in any event, the Tribunal has

[1571] ESOCC, para. 96; EDOCC, paras. 85 and 95.
[1572] ESOCC, paras. 97-101, 130-132
[1573] JX-009, pdf p. 3; JX-010, pdf p. 3.
[1574] JX-012, para. 3 at p. 1; JX-013, para. 3 at p. 1.
[1575] JX-014, pdf p. 2; JX-015, pdf p. 2.
[1576] These negotiations considered ongoing disputes between the Parties about a craft overhead charge, premiums for Project bonds and insurances and Island Park indirect charges, see para. 8 at JX-014, pdf p. 2; JX-015, pdf p. 2.

not seen evidence proving lack of good faith on Reficar's side when it set-off the invoices.

1473. (ii.) Under the PIP, there is a special regulation. In this agreement, Reficar's right to offset required the Parties to hold a preliminary meeting attended by duly empowered representatives, but, contrary to what CB&I now claims, the participation of Reficar's president was not mandatory[1577].

Reficar's set-off

1474. As a second step, the Tribunal must determine whether the set-off performed by Reficar was correct.

1475. CB&I says that the invoices in question (in an amount of USD 3.6 million and COP 125 billion) were improperly set-off by Reficar: these invoices were reasonable and proper and did comply with the formal verification requirements, and notwithstanding the above Reficar improperly used these invoices to set-off amounts owed under other invoices.

1476. Is there evidence in the file proving CB&I's averment?

1477. CB&I has presented four schedules regarding the set-off invoices, described as follows[1578]:

- invoices that were incorrectly offset under the Onshore Contract are identified in Schedule 7;
- invoices that were offset under the Onshore Contract are identified in Schedule 8;
- MOA invoices from which cross-contract payments were offset are identified in Schedule 9;
- Onshore PIP and Invoicing and Payment Procedure invoices from which the cross-contract offsets were taken are identified in Schedule 10.

1478. The Schedules produced by CB&I simply enumerate the invoices which allegedly were improperly offset – but there is no discussion about the reasonableness, propriety and correct verification of each of the invoices.

1479. Reficar, on the other hand, has produced evidence to the contrary: it has drawn the Tribunal's attention to a list of paid invoices[1579], which CB&I in due course failed to substantiate, entitling Reficar to use these payments to offset subsequent invoices submitted by CB&I[1580].

1480. Summing up, the evidentiary situation is the following: CB&I has produced lists of invoices which allegedly were wrongly used as set-offs; so has Reficar, which relies

[1577] PIP, para. 7, JX-014, pdf. P. 2; JX-015, pdf p. 2.
[1578] Wright Updated ER.
[1579] Rejected Invoice Spreadsheet (June 2019), Exhibit C-1762 (filter Column D by "MOA CB" option).
[1580] EDOCC, para. 105.

on its own list of paid invoices which CB&I allegedly failed to substantiate. CB&I, the claimant in this counterclaim, bears the burden of proof. It has failed to prove that the invoices under discussion (in an amount of USD 3.6 million and COP 125 billion) were reasonable and proper, did comply with the formal verification requirements and consequently could not be used to offset subsequent invoices. CB&I's counterclaim regarding set-off invoices is dismissed.

3. DRAW-DOWN ON THE PERFORMANCE LOC

1481. According to Section II, TC 75.2.1 of the Contract, CB&I delivered to Reficar a performance letter of credit ["**Performance LoC**"] in an amount of USD 70 million.

1482. In 2015 Reficar attempted to draw on the Performance LoC, but CB&I sought a temporary restraining order before the United States Federal District Court of Oregon, enjoining Reficar from drawing on it. The District Judge dismissed CB&I's petition. On March 9, 2016 Reficar drew down on this LoC, under the assumption that CB&I had failed to perform one or more of its duties under the Contract[1581].

1483. CB&I now claims that Reficar misappropriated USD 70 million under the LoC in bad faith and in violation of the Parties' agreement[1582], since it failed to specify CB&I's failure to perform its work and to provide CB&I with an opportunity to cure[1583]. CB&I relies on the DRA, which requires Reficar to identify a specific dispute, controversy or claim[1584].

1484. Reficar counters that it was not obligated to establish liability to draw on the Performance LoC; not under the Contract, not under New York (and Colombian) law, where letters of credit are governed by an independence principle – and so the bank does not have to police the underlying dispute[1585].

The Parties' claims

1485. The requests are the following:

- CB&I requests a declaration that it has no liability to Reficar under the Performance LoC[1586] (i.);
- Both Parties ask for a finding by the Tribunal on whether Reficar's draw-down was proper and on whether Reficar has an obligation to return the USD 70 million collected[1587]; CB&I submits an ancillary request, claiming the costs and expenses incurred because of Reficar's improper draw-down[1588] (ii.).

[1581] CPHB, para. 517.
[1582] ESOCC, para. 114.
[1583] ESOCC, para. 115.
[1584] Respondents' Reply on Counterclaim, para. 154.
[1585] EDOCC, para. 344.
[1586] CB&I's Requests for Relief 5. and 24. under the ESOD.
[1587] Reficar's Request for Relief 16. under the CPHB, CB&I's Requests for Relief 25 under the ESOD and 4 under the RPHB.
[1588] CB&I's Request for Relief 4. under the RPHB.

1486. (i.) The first request for relief is inapposite: Reficar has drawn-down the LoC in full, with the necessary consequence that CB&I has no further liability to Reficar under the Performance LoC.

1487. (ii.) These claims would only be relevant had the Tribunal decided that CB&I was not in breach of its contractual obligations or that the compensation owed to Reficar was less than USD 70 million. In that scenario, it would now be incumbent on the Tribunal to determine whether Reficar's draw on the LoC had or not been proper.

1488. But the Tribunal has found that CB&I indeed breached its Cost Control Commitments, and that Reficar is entitled to a compensation for such breach which exceeds USD 70 million. Consequently, there can be no discussion that Reficar's decision to draw down was proper.

1489. A different question is the relevance of the USD 70 million already cashed by Reficar. When the Tribunal establishes the settlement of accounts between the Parties, these USD 70 million will be taken into account (see Section VIII.2.3 *infra*).

4. DRAW-DOWN ON THE ADVANCE PAYMENT LOC

1490. Apart from the Performance LoC, both Parties bring a number of requests for relief with regard to another letter of credit, serving as a bond for the advance payments made to CB&I by Reficar, the Advance Payment LoC[1589].

1491. The Tribunal will briefly summarise the underlying facts (**4.1.**), the Parties' positions (**4.2.**) and enter into a discussion (**4.3.**).

4.1. FACTUAL BACKGROUND

1492. Under TC 75.3 of the Contract, the Parties agreed that CB&I would procure an unconditional and irrevocable on demand guarantee bond for amounts paid by Reficar "in advance of [CB&I] performing the obligations under [the EPC Contract]"[1590].

1493. The guaranteed amount was initially set at USD 25 million; in accordance with TC 75.3, this amount fluctuated over time, and is currently set at USD 95 million[1591].

1494. Similar to the Performance LoC, in 2016 Reficar attempted to draw upon the Advance Payment LoC[1592], but (upon CB&I's motion) Reficar was preliminarily enjoined from doing so by the United Stated District Court Southern District of New York[1593].

1495. The court then scheduled a hearing to decide on Reficar's right to draw upon the guarantee. The hearing was, however, never held, because the Parties reached an agreement: Reficar would withdraw its request for draw-down and defer further

[1589] CB&I's Requests for Relief "t.-w.", ESOD, para. 1612.
[1590] JX-002, p. 264; JX-004, p. 239.
[1591] Ex. R-0108, pdf p. 17.
[1592] Ex. C-1351.
[1593] Ex. R-0357.

attempts until the end of this arbitration[1594]; in exchange, CB&I agreed to extend the duration of the Advance Payment LoC, also until the end of the arbitration[1595].

4.2. THE PARTIES' POSITIONS

1496. The Parties now argue about Reficar's past and present entitlement to draw upon the Advance Payment LoC:

1497. CB&I claims that Reficar's prior attempt to draw upon the Advance Payment LoC was fraudulent, because Reficar requested the draw-down despite being fully aware that it was not entitled to collect those amounts[1596]. In addition, Reficar tried to draw down on the Advance Payment LoC in bad faith and in violation of Colombian law and the EPC Contract[1597]. Reficar's action also constituted an abuse of rights[1598].

1498. Reficar argues that the draw-down attempt it made in 2016 was fully compliant with the express terms of the Advance Payment LoC[1599]. In addition, this draw-down was preceded by extensive good faith negotiations with CB&I, which means that the attempt to draw upon the guarantee was not exercised in bad faith[1600]. More than USD 95 million in advance payments remain outstanding and thus Reficar says it is entitled to draw upon the Advance Payments LoC[1601].

1499. CB&I retorts that Reficar is not currently entitled to draw upon the Advance Payment LoC, as there are no longer any amounts covered by this guarantee[1602]. According to CB&I, the Advance Payment LoC only covered future Works, of which there are none currently; thus, Reficar is not in the position to draw upon the Advance Payment LoC[1603].

4.3. DISCUSSION

1500. The discussion centres around the scope of protection given to Reficar by the Advance Payment LoC: depending on the answer, the Tribunal will establish whether Reficar was, back in 2016, and currently is entitled to draw upon this guarantee.

A. Applicable law

1501. As an initial point, the Tribunal observes that the Advance Payment LoC specifies that it is[1604]

> "subject to and governed by the Laws of the State of New York and the Uniform Customs and Practice for Documentary Credits (2007 Revision)

[1594] Ex. R-0358, Section 3 at pp. 3-4.
[1595] Ex. R-0358, Section 2 at p. 3.
[1596] ESOCC, paras. 378-386; Respondents' Reply on Counterclaim, paras. 132, 148-152, 157-160.
[1597] ESOCC, paras. 382-383, 386.
[1598] ESOCC, para. 385.
[1599] EDOCC, paras. 353-356.
[1600] EDOCC, para. 358.
[1601] EDOCC, para. 352; CPHB; paras. 490-492.
[1602] ESOCC, para. 379.
[1603] ESOCC, paras. 361, 379.
[1604] Ex. R-0108, para. 10 at pdf p. 3.

> International Chamber of Commerce Publication No. 600 and in the event of any conflict, the Laws of the State of New York shall prevail",

and, as a consequence, any arguments regarding the Advance Payment LoC brought by CB&I under Colombian law are inapposite – with the exception of the obligation to deliver the guarantee under TC 75.3, which, being provided for in the Contract, is subject to Colombian law.

B. The definition of "advance payments"

1502. The Tribunal will first look to two major sources to establish the meaning intended by the Parties behind the term "advance payments", and thus, by extension, the scope of Reficar's protection. The Tribunal will consider the text of the Advance Payment LoC (**a.**) and then the EPC Agreement (**b.**).

a. In the Advance Payment LoC

1503. The Advance Payment LoC specifies that the only requirement for the beneficiary to draw upon the guarantee is the submission of the demand letter in accordance with the form attached to the text of the instrument[1605]:

> "Any Demand sent in accordance with paragraph 2 shall be effective upon receipt by the Bank and any Demand shall be conclusive evidence that the amount claimed is due to the Beneficiary under this Letter of Credit".

1504. This form needed to be followed word-for-word by Reficar, with the filling-in of the gaps; once Reficar submitted the duly completed form signed by an authorized representative, it would become entitled to the draw-down[1606]:

> "We hereby certify that:
>
> (a) we have made an advance payment of US$[ ] to the Applicants in accordance with the terms of the Contracts;
>
> (b) one of the Applicants has failed to perform one or more of its obligations under the Contracts;
>
> (c) accordingly, the amount of US$[ ] is due under the Contracts; and
>
> (d) the amount in (c) remains outstanding.
>
> Accordingly, we hereby demand payment under the Letter of Credit of an amount of US$[ ] [...]".
>
> [This form was duly filled out and signed by Reficar's Mr. Reyes Reinoso when Reficar made its draw-down attempt in 2016[1607]].

[1605] Ex. R-0108, para. 4 at pdf p. 2; this reflects the text of the form Advance Payment LoC included in the Contract, see JX-002, p. 622; JX-004, p. 596.
[1606] Ex. R-0108, pdf p. 4; this reflects the text of the form Advance Payment LoC included in the Contract, see JX-002, p. 624; JX-004, p. 598.
[1607] Ex. C-1351.

1505. Under the text of the Advance Payment LoC the only requirement for draw-down is a declaration by Reficar that it has made an advance payment in accordance with the terms of the Contracts and that CB&I has breached one or more obligations under the Contract.

b. <u>In the EPC Contract</u>

1506. The "advance payments" term is not a defined one under the EPC Agreement and it is only used in connection with the Advance Payment LoC.

1507. TC 75.3.1 enshrines CB&I's obligation to procure the Advance Payment LoC and Reficar's corresponding right to draw upon it[1608]:

> "75.3.1 The Contractor shall procure for the benefit of the Owner an approved, unconditional and irrevocable on demand Advance Payment Letter of Credit (in the form set out in Exhibit 11D) from a bank or financial institution which is rated not less than A (or its equivalent) for long-term unsecured debt by S&P or A2 (or its equivalent) for long-term unsecured debt by Moody's and which is reasonably acceptable to the Owner in an amount equal to twenty five million Dollars (US$25,000,000), <u>which secures the money the Owner has paid to the Contractor in advance of the Contractor performing the obligations under this Agreement to which such money relates</u> (the "Advance Payment Letter of Credit") [...]" [Emphasis added].

1508. Under the terms of the Contract, the Advance Payment LoC thus secures payments by Reficar

> "in advance of [CB&I] performing the obligations under [the EPC Agreement] to which such money relates".

1509. There are two categories of payments that exposed Reficar to credit risk vis-à-vis CB&I:

1510. (i) The first category appears to be undisputed by the Parties and concerns monthly advance payments for labour costs, defined as "**Anticipated/Forecast Labour Invoices**"[1609]:

> "6.1.2 As a minimum, the Contractor will have separate invoices for the following groups of reimbursable items:
>
> - <u>"Anticipated/Forecast" labour invoice</u> for the current month" [Emphasis added].

1511. Given the sensitivity of labour issues, these Anticipated/Forecast Labour Invoices were issued a month in advance to ensure that CB&I would be able to cover the workers' fees in a timely manner. In the following month these Invoices would be reconciled with actual labour costs incurred by CB&I[1610].

[1608] Ex. R-0108, pdf p. 17.
[1609] EPC Agreement, Section IV, para. 6.1.2, JX-003, p. 11; JX-005, p. 9.
[1610] EPC Agreement, Section IV, para. 6.1.2, JX-003, p. 11; JX-005, p. 10.

1512. (ii) The second category is constituted by payments made by Reficar to CB&I, which can still be clawed-back by Reficar if the invoices were submitted by CB&I in breach of its Cost Control Commitments.

C. Discussion

1513. CB&I prefers a restrictive interpretation of the term "advance payment" and says that only the monthly labour-related payments, *i.e.,* the Anticipated/Forecast Labour Invoices, were covered by the Advance Payment LoC[1611]; Reficar's view, however, is that the term should be interpreted more broadly[1612].

1514. The Tribunal tends to agree with Reficar for the following two reasons:

1515. First, Reficar's interpretation is confirmed by the form of demand attached to the Contract, which only requires Reficar to declare that it has made an "advance payment".

1516. If the Parties' intention had been that the cover of the Advance Payment LoC be limited to Anticipated/Forecast Labour Invoices, they would have used this term in the instrument – not the wider concept of advance payments in general.

1517. Second, this broader interpretation is also confirmed by the provision of the EPC Agreement which requires that the Advance Payment LoC should be maintained until after the liquidation of the Contract[1613]:

> "75.3.2 The Contractor shall maintain the Advance Payment Letter of Credit in full force and effect until the date which is 28 (twenty-eight) Days after the date of the Liquidation of the Agreement or such earlier date as is agreed between the Parties".

1518. If, as CB&I argues, the Advance Payment LoC was only valid for Anticipated/Forecast Labour Invoices, then it would not have been necessary to continue maintaining this guarantee until the liquidation of the Contract, a step which would take substantively longer than the finalization of the Works themselves.

> [The EPC Agreement provides that it would be liquidated within three months, or a longer period if agreed, following the completion of all the Works or the termination of the Contract[1614]. In fact, the Tribunal will liquidate the Contract as part of the current award, years after the Works ended.]

1519. Summing up, the Tribunal finds that the Advance Payment LoC covered not only the Anticipated/Forecast Labour Invoices paid by Reficar, but also the total USD 5,908.2 million of invoices which Reficar paid, subject to the right of claw-back if CB&I had failed to comply with its Cost Control Commitments with regard to these invoices.

[1611] ESOCC, paras. 361-372; RPHB, para. 673.
[1612] EDOCC, paras. 352, 363-372; CPHB, paras. 490-492.
[1613] JX-002, p. 264; JX-004, p. 240.
[1614] TC 78.1, see JX-002, p. 267; JX-004, p. 242.

1520. In view of the above, Reficar was entitled to draw down the Advance Payment LoC when it attempted to do so in 2016 and remains fully entitled to repeat the draw-down after the conclusion of the arbitration. But any amounts Reficar recovers through this draw-down shall be deducted from CB&I's payment obligations as established in this Award.

1521. On a final note, CB&I requests the Tribunal to declare that Reficar acted in bad faith and fraudulently when it intended to draw-down the Advance Payment LoC in 2016: there cannot have been bad faith or any fraud in Reficar's actions as the Tribunal has found that it was and still is fully entitled to do so.

5. CONCLUSIONS

1522. In summary, CB&I has brought five counterclaims:

1523. (i) CB&I requests USD 48,629,204 and COP 275,238,526,765[1615] for invoices which Reficar refused to pay, and a declaration that, through withholding the payments for these invoices, Reficar had acted intentionally, maliciously, in an abuse of right or bad faith.

1524. The Tribunal has decided that USD 914,939[1616] and COP 28,256,049[1617] constitute reasonable and proper costs, which have been duly invoiced with all supporting documents, and which Reficar is obliged to pay to CB&I; the Tribunal has also denied CB&I's request for a declaration that Reficar had acted intentionally, maliciously, in an abuse of right or bad faith.

1525. (ii) CB&I notes that Reficar settled invoices in an amount of USD 3,578,002 and COP 125,339,561,186[1618] by setting-off these amounts against previous invoices Reficar had already paid, but subsequently questioned its obligation to do so. CB&I requested payment of these off-set invoices.

1526. The Tribunal has dismissed this counterclaim.

1527. (iii) CB&I has also requested payment of USD 70 million, which Reficar drew on the Performance LoC and which, CB&I says, constituted an unlawful appropriation.

1528. The Tribunal has found this counterclaim to be moot, because, when establishing the final settlement of accounts between the Parties, the Tribunal will credit to CB&I the amount which Reficar has collected under the Performance LoC.

1529. (iv) Finally, CB&I has pleaded with the Tribunal to issue a declaration that Reficar is not entitled to draw upon the Advance Payment LoC. The Tribunal has sided with Reficar and found that Reficar is entitled to draw upon this guarantee; hence, CB&I's request for relief is dismissed.

[1615] See Table in para. 1371 *supra*.
[1616] USD 68,270 (Importations) + USD 846,669 (advance letter of credit fees).
[1617] For Nomads.
[1618] Table 1 at RPHB, para. 596.

VII.2.3. IMPROPER DELAY

1530. In addition to the Improper EPC costs claim, Reficar brings a claim for *daño emergente* caused by the delay suffered in the Project. Reficar is claiming a total of USD 896.79 million[1619] in delay-related damages.

1531. Some of these claims – EPC labour escalation and EPC prolongation – have already been addressed in the improper EPC costs claim and cannot be scrutinised again to avoid double-recovery. This leaves

- claims for Owner's delay costs ["**Improper Delay Claim**"][1620], which will be addressed in this section, and

- claims for improper PCS delay costs[1621], which will be addressed separately under Section VIII.3.

[In addition to these claims for *daño emergente*, Reficar brings a number of delay-related claims for *lucro cesante* in a total amount of USD 1,124.13 million[1622]; these will be addressed separately under the *lucro cesante* Section VIII.3.]

1532. The Improper Delay Claim, for USD 165.35 million, which the Tribunal will adjudicate in this Section, is ultimately a modest claim in comparison to the Improper EPC costs claim; however, the amount of evidence on the record for this claim is exponential. The Tribunal will deal with this item in the most expeditious manner possible: after a brief introduction (**1.**), followed by a description of the relevant facts (**2.**) the Tribunal will relate the Parties' positions (**3.**) and enter into a discussion, first analysing the Contract provisions and thereafter apportioning delay on the basis of each Party's responsibility (**4.**).

1. INTRODUCTION

1533. Under the Contract, TC 7.3 provides that[1623]

> "In consideration of payment by the Owner, the Contractor shall, subject to the provisions of this Agreement and in accordance with the Scope of Work, carry out and complete all the Work in accordance with this Agreement and shall:
>
> [...] 7.3.2 regularly and diligently proceed with the Work to achieve Mechanical Completion by the Guaranteed Completion Date [...]".

[1619] CPHB, para. 158: the total of Reficar's delay-related claims actually amounts to USD 1,189.15 million, comprising claims for EPC Labor Escalation (USD 42.68 million), EPC Prolongation (USD 688.76 million), Owner's Delay Costs (USD 165.35 million), PCS Delay Costs (USD 109.88 million), Cost of Capital on Improper Costs (USD 182.48 million)
The Tribunal, however, will consider Cost of Capital and PCS Delay Costs claims separately.
[1620] CPHB, para. 158; communication C-175.
[1621] CPHB, para. 158; communication C-175.
[1622] CPHB, para. 159. The Tribunal notes that the Cost of Capital claim for delay damages in the amount of USD 182.48 million listed under the *daño emergente* category under CPHB, para. 158, is in fact a claim for *lucro cesante* and will thus be addressed separately.
[1623] JX-002, p. 179; JX-004, pp. 164-165.

1534. Under TC 1.1, the "Guaranteed Completion Date" was defined to mean "28 February 2013, or such revised date as may be fixed pursuant to TC 62"[1624] and "Mechanical Completion" was defined as having "the meaning given to it in Section III, Appendix I Schedule 3, excluding the performance of [Unit 002][1625] Post Turnaround Work"[1626].

1535. TC 1.1 also defined "Delay Liquidated Damages" to mean "liquidated damages for delay in achieving Mechanical Completion by the Guaranteed Completion Date, as specified in TC 54.8"[1627].

1536. In sum: CB&I assumed the obligations

- to achieve Mechanical Completion by the Guaranteed Completion Date of February 28, 2013, and

- to pay Delay Liquidated Damages for each day of delay in achieving Mechanical Completion by the Guaranteed Completion Date.

2. FACTS

1537. The detailed factual incidents relevant to Reficar's delay claim will be reviewed when performing the window analysis for ascertaining responsibility. As a brief introduction, however, certain key facts must already be established.

1538. The Parties do not contest that the Project experienced a multitude of delays: Mechanical Completion was scheduled in the Contract for February 28, 2013 (the Guaranteed Mechanical Completion Date); but it is undisputed that this milestone was not achieved until 2015 – both Parties accept that there was a delay of at least two years.

1539. There are three main points of discussion:

1540. First, what was the precise date in 2015 when Mechanical Completion was reached:

- CB&I says it happened on February 23, 2015, when Reficar signed the final subsystem completion certificate for the Project[1628]; while

- Reficar maintains that this occurred on November 17, 2015, when the last major construction item for the final unit on the Project was cleared[1629].

1541. Second, the Parties have identified several causes of delay[1630]:

[1624] JX-002, p. 166; JX-004, p. 152.
[1625] Pursuant to TC 1, "'[Unit 002] Post Turnaround Work' means the activities included in the Scope of Work as being required i) to demolish the FCC unit and associated systems which form part of the Existing Refinery and ii) to leave the relevant area in the condition"; the Tribunal considers this to be inapplicable as CB&I was ultimately not required to demolish Unit 002 but instead to refurbish it.
required by the Owner.
[1626] JX-002, p. 168; JX-004, p.153.
[1627] JX-002, p. 164; JX-004, p. 149.
[1628] RPHB, paras. 178-184.
[1629] CPHB, paras. 134, citing to LI ER, para. 37; Reply, para. 854.
[1630] See LI ER, Appendix 7K; Secretariat ER, Section 4.

- Initial design changes to the Project, including the Synergy Changes;
- The purchase of an alkylation Unit from another refinery project ["**Big West**"];
- The discovery and removal of contaminated soils;
- Delays in procurement, especially structural steel fabrication;
- A shutdown of Unit 002; and
- Labour disruptions,

but have divergent opinions regarding the responsibility for these causes.

1542. Third, the Parties discuss whether Reficar had agreed to certain time extensions.

1543. The relevant evidence includes CB&I's monthly reports, which repeatedly postponed the Mechanical Completion Date:

- In the December 2011monthly report coetaneous to the Representation Letter, CB&I foresaw Mechanical Completion on September 19, 2013, *i.e.*, 203 days after the Guaranteed Mechanical Completion Date[1631];
- Two years later, the September 2013 Report provided a much later estimate for the Mechanical Completion Date: May 12, 2015[1632].

1544. Among other crucial documents invoked by the Parties are two purported Change Orders, which were never signed by both Parties:

- A Change Order discussed in late 2012, envisaging mechanical completion on November 25, 2013;
- A Change Order presented by CB&I in June 2014 seeking an extension of the deadline from February 28, 2013 to May 12, 2015.

3. THE PARTIES' POSITIONS

1545. Reficar claims that CB&I grossly failed to manage the Project Schedule, a failure which caused it to never achieve Mechanical Completion[1633]; or, alternatively, to only achieve Mechanical Completion on November 17, 2015, when the last major construction item for the final unit on the Project was cleared [1634].

[1631] Ex. C-0088, p. 4: "The late deliveries of Substations, Isometric Production, Pipe Fabrication, and Tank Farm Modifications have pushed the Mechanical Completion of the Project to 19 September 2013".
[1632] Ex. C-0109, p. 20.
[1633] ESOC, para. 467.
[1634] CPHB, paras. 134-135, citing to LI ER, para. 37.

1546. Out of the 992 days of alleged delay[1635], Reficar concedes that there were 231 days of delay for which there was either Reficar's[1636] or joint responsibility[1637], with the result that CB&I was solely responsible for causing 662 days of delay.

1547. But even for the delay for which CB&I was not solely responsible, CB&I cannot benefit from any purported extension to the Mechanical Completion date stipulated in the EPC Contract (February 28, 2013), because CB&I recklessly disregarded the strict procedure for extending the Guaranteed Completion Date under the EPC Contract[1638].

CB&I's position

1548. CB&I says, as a first argument, that there was no delay at all in the Project Schedule as:

- Reficar tacitly accepted an extended Guaranteed Mechanical Completion Date of May 12, 2015, communicated in the monthly report for September 2013[1639] and in CB&I's September 2013 Schedule update[1640], and

- Mechanical Completion was achieved on February 23, 2015, three months ahead of this extended Guaranteed Mechanical Completion Date[1641].

1549. Subsidiarily, in its view, Mechanical Completion was achieved on February 23, 2015, the day when Reficar signed the subsystem completion certificate for Unit 002, the last unit on the Project[1642]. The delay of the Project would, thus, be set at 725 days[1643]. CB&I further denies responsibility for any of these 725 days of delay.

4. DISCUSSION

1550. The Tribunal will first analyse CB&I's obligations to control the Project Schedule (**4.1**) and the Contract provisions regarding the completion of the Project (**4.2**); the Tribunal will later attribute responsibility for delays to the critical path on the basis of a window analysis using both Parties' expert reports (**4.3**) and reach a conclusion on the number of days of delay that CB&I was responsible for and the resulting harm to Reficar (**4.4**).

4.1. SCHEDULE CONTROL COMMITMENTS

[1635] CPHB, para. 153.
[1636] Reficar says it was solely responsible for 99 days of delay and that both Parties were responsible for 132 days of delay, see CPHB, para. 151.
[1637] CPHB, paras. 135, 151.
[1638] CPHB, paras. 136-141.
[1639] Ex. R-1855_102, p. 21.
[1640] RPHB, para. 211, citing to Ex.C-0513, pdf p. 11 (actual citation to p. 20 appears to be a mistake both source page and pdf page-wise); ESOD, para. 1063, citing to Ex. R-1395 at p. 43 and para. 1215, citing to R-0264.
[1641] RPHB, paras. 172, 176.
[1642] RPHB, paras. 178-184; ESOD, para. 1028.
[1643] Secretariat ER, paras. 4.3.63 at pdf p. 204 and 4.6.2 at pdf p. 265.

1551. The Tribunal has previously established that the EPC Contract contains Cost Control Commitments, which obligated CB&I:

- To act with heightened diligence when incurring costs;
- To only incur costs that were proper and reasonable and in accordance with the Contract; and
- Though the Contract was of cost-reimbursable nature, to treat the costs as if the Contract were signed on a lump sum remuneration basis.

1552. The EPC Contract also contains provisions with regard to CB&I's control of the Project Schedule [previously defined as the "**Schedule Control Commitments**"]; these provisions impose a heightened duty on CB&I:

- First, CB&I undertakes to achieve a specific result: Mechanical Completion of the Project by the Guaranteed Mechanical Completion Date (i);
- Additionally, CB&I also assumes an obligation of diligence: to use its best efforts in controlling the Schedule, as if the Project were CB&I's own (ii).

1553. There is a marked difference between the agreed contractual regime for the control of costs and the control of schedule: while the Cost Control Commitments create a duty of diligence, the Schedule Control Commitments imply an obligation of result: CB&I undertook to achieve Mechanical Completion by an agreed date.

1554. (i) CB&I assumed an obligation of result to achieve Mechanical Completion of all Units[1644] by the Guaranteed Mechanical Completion Date (both terms analysed in the subsequent subsections) – otherwise, it would incur Delay Liquidated Damages for each day of delay in accordance with TC 54.8[1645]:

> "[i]f the Contractor fails to achieve Mechanical Completion of all of the Units by the Guaranteed Completion Date, the Contractor shall be liable to pay Delay Liquidated Damages for each Day from the Day immediately following the Guaranteed Completion Date up to and including the date Mechanical Completion of all of the Units is achieved […]".

1555. (ii) Additionally, TC 7.3 of the Contract provides that CB&I should proceed with the Works regularly and diligently[1646]

> "[…] the Contractor shall, subject to the provisions of this Agreement and in accordance with the Scope of Work, carry out and complete all the Work in accordance with this Agreement and shall:
>
> 7.3.2 regularly and diligently proceed with the Work to achieve Mechanical Completion by the Guaranteed Completion Date […]".

[1644] With the exception of Unit 002, which could be delivered 104 days afterwards pursuant to TC 54.8.1A, JX-002, p. 226; JX-004, p. 203.
[1645] JX-002, p. 226; JX-004, p. 203.
[1646] JX-002, p. 179; JX-004, pp. 164-165.

1556. TC 51.1 contains a similar provision obligating CB&I to perform Works in accordance with the Project Schedule[1647]:

> "51.1 The Contractor shall undertake all Work in accordance with the Schedule. The Contractor shall be responsible for promptness of execution of the various parts of the Work and shall employ at all times a sufficient number of personnel skilled and experienced in their lines of work and a sufficient organization and equipment so that completion of the Work shall not be delayed and the Work shall be completed in accordance with the Schedule [...]".

1557. This general obligation is reflected in the Project Execution Plan, in the same provision which formalizes the Heightened Diligence Obligation, and which specifically applies not only to cost but also to schedule control[1648]:

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own" [Emphasis added].

4.2. MECHANICAL COMPLETION

1558. The Parties agreed under the EPC Contract that the Guaranteed Mechanical Completion Date was February 28, 2013[1649]. Mechanical Completion is defined as the state of a part of the Refinery when it is ready for PCS Works.

1559. The Parties have quantified the delay as the difference between the Guaranteed Mechanical Completion Date and the actual Mechanical Completion, and arrived at different results, because:

- First, CB&I is of the view that Reficar agreed to a postponement of the Guaranteed Mechanical Completion Date (**4.2.1.**);
- Second, the Parties have divergent opinions on when Mechanical Completion was achieved (**4.2.2.**)

4.2.1. POSTPONEMENT OF THE GUARANTEED MECHANICAL COMPLETION DATE

1560. The Tribunal must first ascertain whether the original Guaranteed Mechanical Completion Date February 28, 2013 is still applicable, or if, as pleaded by CB&I, such date was properly extended by the Parties.

1561. The salient provision for extending the Guaranteed Mechanical Completion Date is TC 54 on hindrances and delays, which specifies the causes of delay which entitle the Contractor to seek an extension (such as interferences by the Owner, orders to suspend the Work or effects of force majeure)[1650]:

[1647] JX-002, p. 222; JX-004, p. 199.
[1648] JX-002, p. 654; JX-004, p. 628.
[1649] TC 1 Definitions; JX-002, p. 166; JX-004, p. 152.
[1650] TC 54.4.1, JX-002, pp. 224-225; JX-004, pp. 201-202.

> "54.4.1 Subject to the other provisions of this TC54, the Contractor shall only be entitled to request an extension of time to the Guaranteed Completion Date where any of the following events impact the critical path of the Work as shown in the then current Schedule and as a result the achievement of Mechanical Completion of all of the Units is delayed:
>
> (i) any act of prevention, interference, default or breach by any Owner Group member;
>
> (ii) Not used;
>
> (iii) an order to suspend the Work pursuant to TC66, except to the extent that such order is caused due to the Contractor's failure to duly perform its obligations under this Agreement;
>
> (iv) the effect of an Event of Force Majeure;
>
> (v) a cause of delay expressly entitling the Contractor to give a "Written Notice to the Owner in accordance with TC54.2 requesting an extension of time to the Guaranteed Completion Date" under any other TC of this Agreement;
>
> (vi) not used;
>
> (vii) suspension by the Contractor under TC65.13 due to the Owner's failure to pay undisputed invoiced amounts;
>
> (viii) not used; and
>
> (ix) any error, discrepancy or change in any Rely Upon Information".

1562. In order for an extension to be effective, CB&I had to comply with certain formalistic requirements:

1563. (i) CB&I had to adhere to rigid timelines, with an initial notification made within 14 days of becoming aware, or when reasonably expected to have become aware, of a delay event[1651] and a further, more detailed notification, to be filed within the following 14 days[1652].

1564. For delay events of continuing effect, CB&I was entitled to a modified procedure: first submitting within the same deadline of 14 days a notice, and after a further 14 days, instead of a detailed statement, to notify Reficar, with further interim notices given every 28 days – until it could provide a final notice with sufficient detail and fulfilling the substantive requirements[1653].

1565. (ii) The notice had to meet a formal requirement: it needed to specify the TC which CB&I was invoking[1654].

[1651] TC 54.2.1, JX-002, p. 224; JX-004, p. 201.
[1652] TC 54.2.2, JX-002, p. 224, JX-004, p. 201.
[1653] TC 54.3, JX-002, p. 224; JX-004, p. 201.
[1654] TC 54.2.2, JX-002, p. 224; JX-004, p. 201.

1566. The Tribunal notes that the Parties have, throughout the Project, frequently acted without adhering to the formal requirements under the EPC Agreement, displaying their intention to only place limited importance on such requirements[1655]. In view of this practice, Reficar cannot rely on the lack of formality of the notification to claim that it was not properly informed of the delayed date of Mechanical Completion; especially given Reficar's participation in schedule reforecast exercises and in monthly meetings with CB&I in which the date of Mechanical Completion was routinely discussed[1656].

1567. (iii) The notice also had to meet certain substantive requirements: information on the material circumstances of the delay event, the nature and extent of the delay, the corrective actions undertaken, the effect on the critical path and the requested extension to the Guaranteed Mechanical Completion Date[1657].

1568. TC 54.7 is clear as to the effects of a failure by CB&I to follow the above steps:

- First, a failure to follow the notice requirements results in the lack of extension to the Guaranteed Mechanical Completion Date, and

- Second, such failure, if not remedied within seven days of the time periods for notification, would automatically constitute prejudice to Reficar.

1569. CB&I claims that it is entitled to time extension, by way of any of the following three mechanisms: the Delay Change Order (**A.**), the Monthly Schedule Updates (**B.**) or the Owner's Change Order (**C.**).

A. Delay Change Order

1570. On June 10, 2014, over a year after the Guaranteed Completion Date in the Contract, CB&I requested an extension to the Guaranteed Completion Date from February 28, 2013 to May 12, 2015, *i.e.*, a single deferral of 803 days [the "**Delay Change Order**"][1658]. The Parties make extensive arguments about this Change Order[1659].

1571. The reasons for the extension requested in the Delay Change Order are threefold[1660]:

- Expanded development scope of Unit 002, with a specific reference to the decision made by Reficar in March 2010,

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[1655] For example, the Tribunal has analysed the WNOCs rejected by Reficar and granted some of the underlying amounts as Excluded Costs regardless of whether said WNOCs fulfilled the formal requirements, see Section VII.2.1.3.3.2.B.b *supra*. The Tribunal will also find that the formal step of issuing a Certificate at Unit level was not necessary for Mechanical Completion, see para. 1614 *infra*.
[1656] See e.g., Ex. R-0068; Ex. R-1813.
[1657] TC 54.2.2, JX-002, p. 224; JX-004, p. 201.
[1658] Change Order 222; Ex. C-0354, pp. 3-4.
[1659] The Tribunal is aware of other Change Orders which determined an impact to the Project Schedule, such as Change Order 425, see JX-425; however, Reficar rejected the time impacts for those Change Orders because CB&I failed to comply with the requirements of TC 54, see JX-426, referencing Ex. R-1849_13203.
The Tribunal also accepts the testimony given under oath by Mr. Warhoe, who said that CB&I never submitted a timely Change Order based on the notice requirements of TC 54, see Tr. 4572:12-4573:22.
[1660] Ex. C-0354, p. 4.

- Deletion of MECOR's scope of work, with a specific reference to CB&I's notification of the change in January 2012, and

- Purchase of recycled alkylation Unit, around 2010, as found by the Tribunal in its analysis of scope changes to the Project under Section VII.2.1.3.3.2.A.c.

1572. CB&I relies on the Delay Change Order to maintain that the Guaranteed Completion Date was pushed forward to May 12, 2015.

1573. Reficar denies this; it never accepted the Delay Change Order[1661], nor could it, as the Delay Change Order did not comply with the contractual requirements for a valid time extension:

- The Delay Change Order was not submitted in a timely manner, in fact, it was submitted not two weeks but two years after the last of the referenced delay events; furthermore, there is no information that the Delay Change Order was submitted under the modified procedure for extended delay events;

- The Delay Change Order does not comply with the substantive requirements, as it does not contain sufficient detail; in fact, the argumentation is limited to a single page, and it does not determine the impacts on the critical path of the Project[1662].

1574. The Tribunal sides with Reficar: without Reficar's acceptance, the Delay Change Order cannot be invoked by CB&I as support for the allegation that an extension of the Guaranteed Mechanical Completion Date had been agreed.

B. Monthly Schedule Updates and Schedule Reforecasts

1575. CB&I argues that Reficar continuously agreed to extensions to the Mechanical Completion Date by tacitly accepting CB&I's Monthly Schedule Updates and Schedule Reforecasts throughout the Project[1663].

1576. CB&I's argument does not hold ground when confronted with the text of TC 54.7, which unambiguously states that CB&I could only be entitled to any extension of the Guaranteed Completion Date if it followed the requirements of TC 54[1664]:

> "54.7 Failure to Comply
>
> In the event that the Contractor fails to submit any of the notices required under this TC54 within the time periods required and such failure prejudices the Owner, the Contractor shall have no entitlement to any extension of time unless the Owner in its absolute discretion agrees otherwise. In the event that the Contractor fails to submit any of the notices required under this TC54

[1661] Ex. C-0354, p. 4.
[1662] The document states at Ex. C-0354, p. 3 that "[t]his change order affects the critical path of the Project" but this broad statement is insufficient to fulfil the requirement of determining the impacts on the critical path.
[1663] RPHB, paras. 172, 176; ESOD, paras. 1260, 1262.
[1664] JX-002, pp. 225-226; JX-004, p. 202.

> within seven (7) Days of the time periods required, such failure shall automatically constitute prejudice to the Owner".

1577. The only exception to this general rule was if Reficar "in its absolute discretion agree[d] otherwise" – something which the fact record proves Reficar never did.

C. Owner's Change Order

1578. CB&I avers that Reficar acknowledged that a six-month extension to the Guaranteed Mechanical Completion Date was appropriate when in early 2013[1665] it issued an Owner's Change Order granting such extension based on Reficar's discretionary power to do so[1666].

1579. The facts prove otherwise.

1580. In the Owner's Change Order referenced by CB&I, Reficar only offered to extend the Guaranteed Mechanical Completion Date within negotiations between the Parties undertaken in 2012 and early 2013. The negotiations ended without any agreement, CB&I rejected the Owner's Change Order[1667] and, thus, the extension to the Guaranteed Mechanical Completion Date offered by Reficar in the course of negotiations never came into effect.

* * *

1581. The Tribunal, thus, finds that the Guaranteed Completion Date is the original Contract date of February 28, 2013.

4.2.2. Actual Mechanical Completion

1582. Having established the Guaranteed Mechanical Completion Date, the Tribunal needs to consider the separate issue of when Mechanical Completion took place.

1583. Reficar's expert, Long International, says that the ultimate Mechanical Completion date was November 17, 2015; thus, there was a delay of 992 days from February 28, 2013.[1668] CB&I's expert, Secretariat, maintains that Mechanical Completion was achieved when the final Subsystem Mechanical Completion Certificate was signed by Reficar on February 23, 2015[1669]. This gives 725 days of delay[1670].

1584. The decision on the date of Mechanical Completion is of crucial importance, because the difference in the experts' opinions amounts to 267 days of delay – almost nine months.

1585. In determining the date of Mechanical Completion, the Tribunal will look to two major sources: the EPC Contract (**A.**) and the Certifications and Completions

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[1665] Ex. R-1849_13173, pp. 2-3.
[1666] ESOD, para.1252, citing to Ex. R-1849_13173 and ESOC, para. 486.
[1667] See Ex. C-0102, p. 1: "While we appreciate Reficar's decision to extend the Guaranteed Completion Date, the time extension and additional costs provided by RCSA/001 does not sufficiently reflect the agreements reached during our recent schedule and cost alignment discussions".
[1668] Table 7.8-1, LI ER.
[1669] Secretariat ER, para 2.5.13, and Ex. R-2576 referring to Unit 002.
[1670] Secretariat ER, para. 2.6.36.

Procedure (**B.**) and on its basis make a decision (**C.**), finalizing with Reficar's counterarguments (**D.**)

A. Contract definition

1586. As previously referenced, under TC 1.1, the "Mechanical Completion" is defined as having

> "the meaning given to it in Section III, Appendix I Schedule 3, excluding the performance of the FCC Post Turnaround Work".

1587. The definition in Section III, Appendix I Schedule 3 at Section 3.1.1 says as follows[1671]:

> "MECHANICAL COMPLETION
>
> 3.1.1 Mechanical Completion is defined as meaning [except for minor items of work that would not affect the pre-commissioning/commissioning of the Plant]. (i) all materials and equipment for the Plant have been installed substantially in accordance with the plans, specifications, and checked for alignment and rotation, [hydrostatic or pneumatic pressure integrity]; (ii) all systems required to be installed and tested by Contractor have been installed and tested; (iii) the facility or the remainder of the Plant, as applicable, has been checked to permit commissioning; (iv) the equipment and systems have been installed in a manner that does not void any equipment or system warranties (vendor's, licensor's, and third parties; (v) the facility or the remainder of the Plant, as applicable, is ready to commence pre-commissioning/commissioning, testing, and operations; and (vi) a punch list of the uncompleted items is established and mutually agreed upon by RCSA and Contractor. Mechanical Completion can be accomplished in incremental steps, the sum total of which shall constitute Mechanical Completion of the Plant. For the avoidance of doubt, further definition of Mechanical Completion is provided in the attached Division of Responsibilities Matrices for each discipline" [Insertions in brackets in original].

1588. In sum, Mechanical Completion requires:

- First, that all systems in a certain facility have been installed and tested by CB&I and the facility has been cleared for PCS work to begin; in this context, the term facility used in the Contract includes both Subsystems and Units;
- Second, all materials and equipment have been installed "substantially" in accordance with the plans and specifications;
- Third, Mechanical Completion could be accomplished in steps, facility by facility, and once all facilities had reached that status, Mechanical Completion of the Refinery would have been achieved;
- Fourth, Mechanical Completion only requires that the work in the facility is "substantially" complete; any remaining uncompleted minor works or

[1671] JX-006, p. 573.

deviations would be recorded in a punchlist[1672], agreed by the Parties, and CB&I would finalize these items in due course.

The Punchlists

1589. The Contract defines a "**Punchlist**" as:[1673]

> "the list of minor items or incomplete work that is agreed between the Parties to be completed after Mechanical Completion, none of which will impact the ability of the Owner to own, utilize and operate the relevant Work in a safe manner in accordance with all guidelines from Lower Tier Subcontractors, Vendors and the Contractor". [Emphasis added]

1590. A Punchlist is, thus, a list of works still not finished in a facility which is handed over as mechanically complete; these remaining works can only be of a minor nature and cannot affect the safe operation of the facility. A facility can achieve Mechanical Completion even if it is not fully complete, as long as it is safe and ready for PCS works to begin.

Final Completion

1591. There is a term in the Contract that *prima facie* looks similar to Mechanical Completion, but which has a different meaning. "**Final Completion**" designates another milestone in the Project, subsequent to Mechanical Completion; the Contract uses the term for the date when[1674]

- the entire Work has attained Mechanical Completion,
- all work has been completed (including the performance of all items identified in the Punchlists), and
- the requisite documentation has been delivered by CB&I to Reficar.

1592. Final Completion is not the relevant date for calculating delay; it is only relevant for other matters, including payment of the final tranche of the Contractor's Fixed Fee[1675].

1593. The definition is helpful, however, for reinforcing that even after the entire Refinery achieved Mechanical Completion, there would still be pending works; thus, again, "substantial" (but not final) completion and readiness for PCS Works are sufficient for achieving Mechanical Completion.

B. Certifications and Completions Procedure

1594. The language in the Contract specifies that CB&I was to develop and issue for Reficar's approval a "systems turnover procedure one year before the Mechanical

[1672] The Tribunal notes that the record contains variations of the term: "Punch List", "Punchlist", "punch list", "punchlist" but that all of these terms have the same meaning.
[1673] TC 1 Definitions, JX-002, p. 169; JX-004, p. 155.
[1674] TC 1 Definitions, JX-002, p. 165, JX-004, p. 150.
[1675] TC 54.8.8, JX-002, p. 227; JX-004, p. 204.

Completion date"[1676], which CB&I first did in July 2011; the document was later revised multiple times [the "**Certifications and Completions Procedure**" or "**CCProcedure**"][1677].

1595. The Tribunal will first address the provisions on completions (**a.**), and later the ones on certifications (**b.**).

a. Procedure for establishing Mechanical Completion

1596. The CCProcedure builds upon the Contract definition of Mechanical Completion, specifying three steps required for each Unit or Subsystem to be considered mechanically complete[1678]:

1597. (i) An **"A" Check Sheet** was used to establish that equipment, piping, and instrumentation had been properly constructed, installed, inspected, tested and documented. The signing by Reficar of the "A" Check Sheet meant that 100% of the major items on a Unit or Subsystem were complete[1679].

1598. (ii) A Punchlist of outstanding items had to be agreed. The CCProcedure provides four different categories of Punchlist items, with the most relevant being **Category "A" Punchlist** items, which affect the safety of a system and necessarily must be completed before PCS Works could start[1680]. Thus, Mechanical Completion of a Unit or Subsystem could not be achieved with any outstanding Category "A" Punchlist item.

1599. (iii) CB&I had to issue a notice ["**Walkdown Notice**"], and thereafter the Parties, together with Foster Wheeler, had to perform a walkdown inspection of the Unit or Subsystem [the "**Walkdown**"].

1600. In sum, for Mechanical Completion of a Unit or Subsystem to be achieved, three conditions, enumerated at para. 13.3 of the CCProcedure, had been complied with[1681]:

- All "A" Check Sheet items completed;
- No outstanding Category "A" Punchlist items, and
- Walkdown had been completed.

Deviation Rules

1601. By late 2013, and in view of the accumulated delay, Reficar decided to accelerate the final stages of the Project, by permitting overlap between the EPC Contract,

[1676] Section III, Appendix I Schedule 3 at Section 3.2.3; JX-006, p. 576.
[1677] Ex. C-0350, p. 1.
[1678] Ex. C-0350, para. 10.1 at pdf p. 22; also see Figure 10b – Sub-System Construction Completion Flow at p. 24.
[1679] Ex. C-0350, para. 10.4 at p. 22, para. 12.5.3 at p. 29 and para. 13.3 at p. 33.
[1680] Ex. C-0350, para. 9.6 at p. 19.
[1681] Ex. C-350, para. 13.3 at p. 33.

which was being performed by CB&I, and the subsequent PCS Works – which was to be carried out by other contractors designated by Reficar.

1602. The procedure originally delineated under the CCProcedure was modified by the Parties through a set of guidelines of very high level [the "**Deviation Rules**"][1682], agreed at a meeting between Reficar and CB&I[1683].

1603. The main difference introduced by the Deviation Rules was that, for Mechanical Completion to be achieved, certain deviations from the three major prerequisites were allowed.

1604. Thus, for the Walkdown Notice to be issued[1684]:

- Certain check sheets were no longer required[1685], others only needed to be 75% complete[1686], and others still only needed be 50% complete[1687], and

- Category "A" Punchlist items no longer needed to be complete; instead, a deadline for completion by CB&I after Mechanical Completion was sufficient[1688].

1605. As a result of these modifications, Mechanical Completion could be achieved much quicker than originally intended, PCS Works could also start earlier and commercial production by the Refinery would be accelerated.

b. Procedure for the certification of Subsystems and Units

1606. The CCProcedure provides for two main levels of Mechanical Completion[1689]:

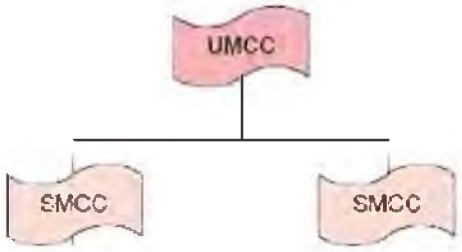
- Subsystem Mechanical Completion, which would be achieved once a Subsystem had reached Mechanical Completion and Reficar had signed the corresponding Certificate[1690];

- Unit Mechanical Completion, which would be achieved once all Subsystems of a Unit had achieved Mechanical Completion and Reficar had signed the Certificate for that Unit

[1682] Ex. C-0127.
[1683] The closest document to an agreement by the Parties on this issue is the minutes of a meeting of September 4, 2014, during which CB&I and Reficar employees discussed the procedure for walk-downs that would precede the release of SMCCs by CB&I and their signing by Reficar's representatives whenever a sub-system was ready for pre-commissioning, the first step of PCS; see Ex. R-2638. This was confirmed at the Hearing by Mr. Benavides, see Tr. 2252:13-2253:23.
[1684] Ex. C-0127, p. 1.
[1685] Ex. C-0127, p. 1: "Painting (X) and Insulation (Q) check sheets are not required".
[1686] Ex. C-0127, p. 1: "Piping (P) and Mechanical (M) discipline check sheets must each be 75% complete or greater for that sub-system".
[1687] Ex. C-0127, p. 1: "Electrical (E), Instrument (I), and Telecom (T) discipline check sheets must each be 50% complete or greater for that sub-system".
[1688] Ex. C-0127, p. 2.
[1689] Ex. C-0350, p. 33.
[1690] The Tribunal notes that there was also the possibility to achieve Mechanical Completion at the discipline level, but this level of Mechanical Completion is not relevant for the discussion.

1607. The following diagram shows the relationship between the two levels of Mechanical Completion[1691]:

Unit Mechanical Completion Hierarchy



1608. As soon as all Certificates at the Subsystem level of a certain Unit had been signed, Reficar was obliged to sign the Certificate for that Unit, as confirmed by the CCProcedure[1692]:

> "This Certificate is issued for a unit upon receipt of all SMCCs for each subsystem within the unit".

1609. In other words: once Reficar had signed all the Subsystem Certificates for a given Unit, it could not, on a discretionary basis, refuse to sign the Certificate for the entire Unit.

Transfer of care, custody and control

1610. The CCProcedure says that the signing of the

> "[C]ertificate transfers ownership of the sub-system/unit from the construction team to the commissioning team".

1611. Ownership in this context may be understood as care, custody and control; thus, as soon as Reficar signed the Certificate at Unit or Subsystem level, it took over that part to start PCS Works; this is in line with TC 35.2, which states that [1693]:

> "35.2 Whenever any portion or system of the Work achieves Mechanical Completion the Owner or its designee may, by Written Notice to the Contractor, take custody and care of and operate in a commercial fashion such Work as a "Turnover System" prior to Final Completion [...]".

1612. That the signing of a Certificate by Reficar meant the transfer of custody (and, impliedly, also care and control) is also confirmed by the minutes of a meeting of November 2013[1694]:

Item	Description of Discussion	Action By	Complete By

[1691] Ex. C-0350, p. 34. The DMCC in the diagram stands for Discipline Mechanical Completion Certificate, a level below the SMCC, which is not relevant to the discussion.
[1692] Ex. C-350, p. 33.
[1693] JX-002, p. 210; JX-004, p. 189.
[1694] Ex. R-2639, p. 2

2.14	Care Custody Control – Once the Walk-Down has been done and the DMCC/SMCC has been signed, the client takes custody of it. All subsequent work to be carried out on that sub-system will be carried out under the Reficar Commissioning Permit to Work system.	INFO	

1613. The transfer of custody, care and control reinforces the Tribunal's finding that the signing of a Certificate (at Unit or Subsystem level) by Reficar constituted the moment of Mechanical Completion of the corresponding Unit or Subsystem.

C. Decision

1614. It is crucial to accurately establish when Mechanical Completion actually occurred:

- Reficar says that the Project Mechanical Completion Date was November 17, 2015, when the last "A" Check Sheet was signed; thus, there was a delay of 992 days from February 28, 2013[1695], and

- CB&I says that Mechanical Completion was achieved when the final Certificate at the Subsystem level was signed by Reficar on February 23, 2015[1696]: this gave 725 days of delay.

1615. Both positions are dictated by differing interpretations of the EPC Contract, the CCProcedure and the Deviation Rules by the Parties, rather than calculations performed by the Parties' delay experts – who only looked at the responsibility for delays in different periods rather than the total length of delay.

Discussion

1616. The Tribunal sides with CB&I.

1617. Reficar's argument is not grounded on the Parties' agreements – neither the Contract nor the CCProcedure nor the Deviation Rules establish Reficar's signature of the final "A" Check Sheet as the moment of Mechanical Completion – this requirement only was relevant under the Parties' initial agreement, but it was superseded by the Deviation Rules.

1618. Under the CCProcedure, Mechanical Completion could not be achieved if there were any outstanding:

- "A" Check Sheet items (construction elements crucial for completion), or

- Category "A" Punchlist items (major identified defects).

1619. The Deviation Rules, however, lowered the requirements:

- certain check sheet items were no longer required, with completion at only 50% or 75% being accepted for certain disciplines, with no exception for "A" Check Sheets;

[1695] CPHB, paras. 134-135, citing to LI ER, para. 37.
[1696] RPHB, paras. 178-184; ESOD, para. 1028.

- Category "A" Punchlist items were specifically allowed to remain uncleared for Mechanical Completion; those items would later be completed within a deadline set for CB&I.

1620. Once CB&I had achieved sufficient completion, what was left was the certification process (which remained unchanged by the Deviation Rules): after the issuance of a Walkdown Notice, both Parties would together inspect the works, culminating in Reficar signing the appropriate Certificate, whenever it was satisfied that the Unit or Subsystem inspected fulfilled the completion requirements under the Deviation Rules.

1621. It is a proven fact that, by February 23, 2015, Reficar had signed the Certificates of all Subsystems which constitute the Project[1697]. At that time, Reficar had, however, failed to sign certain Certificates at Unit level (Reficar postponed signing of the last Certificate at Unit level until 2016).

1622. Was Reficar's failure to sign certain Certificates at Unit level, although the totality of Certificates at Subsystem level had been signed, sufficient to impede Mechanical Completion of the Project?

1623. As previously found by the Tribunal, the issuance of a Certificate at Unit level was a mere formality, once the Certificates pertaining to the totality of Subsystems constituting that Unit had been signed. The necessary consequence is that Mechanical Completion of the Project was achieved on February 23, 2015.

* * *

1624. Thus, CB&I achieved Mechanical Completion of the Project in its totality when the final Certificate at Subsystem level was signed by Reficar, on February 23, 2015.

D. Reficar's counterarguments

1625. Reficar makes five counterarguments that, in its opinion, prove that Mechanical Completion occurred only on November 17, 2015, all of which will be dismissed by the Tribunal.

First counterargument

1626. Reficar argues that in the Deviation Rules the Parties agreed that CB&I would first achieve "partial mechanical completion" and then "final mechanical completion"[1698]. According to Reficar, PCS works by Reficar's contractors could commence as soon as "partial mechanical completion" was achieved; the date of Mechanical Completion relevant for calculating delay would only be the "final mechanical completion"[1699].

1627. Reficar also tries to introduce the concept of Partial Unit Mechanical Completion Certificates[1700] – proof, according to Reficar, that only final mechanical completion

[1697] Ex. R-0118; Ex. R-1442, p. 4.
[1698] CPHB, para. 395; ESOC, para. 138, citing to the Deviation Rules.
[1699] LI ER, Appendix 7N, para. 10.
[1700] CPHB, para. 395; ESOC, para. 138.

could constitute Mechanical Completion under the EPC Contract. According to Reficar, the introduction of these Certificates was agreed in the Deviation Rules[1701].

1628. The Tribunal disagrees.

1629. First, Reficar cannot blow hot and cold at the same time: on the one hand, it wanted to accelerate the signing of Certificates, to allow its PCS contractors to immediately begin PCS Works, but on the other hand it now says that the signing of the Certificates only constituted "partial" Mechanical Completion, because some works were still pending.

1630. Second, the Tribunal has studied the Deviation Rules and has not found a single reference to "partial" completion.

1631. The term "partial mechanical completion" is used almost exclusively in Reficar's communications to CB&I[1702]. It is true that certain monthly reports prepared by CB&I also use the terms "Partial Completion" and "Final MC"[1703], but these reports only reflected CB&I's views, and did not constitute a mutually agreed source of obligations between the Parties, that could have modified the EPC Contract and the CCProcedure.

1632. Third, the document referenced by Reficar as a Partial Unit Mechanical Completion Certificate is likewise an ordinary Certificate of completion at the Unit level, with no mention of the word "partial"[1704]:

CBI	Refineria De Cartagena	166000	reficar
UMCC	**UNIT MECHANICAL COMPLETION CERTIFICATE**		
Certificate No:	UMCC-1-044		
Unit No:	044		
Unit Description:	HF Alkylation Complex		
Date UMCC Raised:	9-Feb-2015		

1633. On a final note, the Tribunal agrees with Reficar that Mechanical Completion did not mean the end of CB&I's Works on the Project; this is confirmed by the deadlines set for the completion of outstanding "A" Check Sheet and Category "A" Punchlist items. These obligations have no bearing on Mechanical Completion, however, and will be addressed separately under the Section VII.2.3 *infra* on Reficar's Work Completion claims.

[1701] ESOC, para. 471.
[1702] See *e.g.*, Ex. C-0357, p. 1,
[1703] ESOC, para. 139, citing to Ex. C-0128, p. 26.
[1704] Ex. C-0357, pdf p. 3.

Second counterargument

1634. Reficar argues that under the EPC Agreement, the CCProcedure, industry standards and common sense, a Unit could not achieve Mechanical Completion with "A" Punchlist items open because of safety reasons[1705].

1635. Reficar cites to the testimony of Mr. Benavides, who testified at the Hearing that "Reficar's intention was never to take custody and control of subsystems", because the issuance of permits and safety reasons allegedly required custody and control to be taken over on a Unit rather than a Subsystem level[1706].

1636. The Tribunal is unconvinced.

1637. First, as regards Reficar's safety-related arguments, industry standards must give way to Reficar's conscious decision to accept as mechanically complete Subsystems which still had pending items that impacted safety.

1638. Second, Mr. Benavides's testimony that Mechanical Completion could only be achieved on a Unit-by-Unit basis, is contradicted by the CCProcedure, which specifically allows for Mechanical Completion to be achieved at the Subsystem level.

Third counterargument

1639. Reficar also argues that Certificates at the Subsystem level were not sufficient to transfer care, custody and control[1707].

1640. This argument is a *non-sequitur*: under the Contract the transfer of care, custody and control of Subsystems is not a requirement, but rather a consequence of Mechanical Completion.

1641. In any event, Reficar's argument is contradicted by the wording of the CCProcedure, which refers to "Certificate", including both Certificates at the Subsystem and the Unit level:

> "This certificate transfers ownership of the sub-system/unit from the construction team to the commissioning team".

1642. That the signing of a Certificate by Reficar meant the transfer of custody (and, impliedly, also care and control) is also confirmed by the minutes of a meeting of November 2013[1708]:

2.14	Care Custody Control – Once the Walk-Down has been done and the DMCC/SMCC has been signed, the client takes custody of it. All subsequent work to be carried out on that sub-system will be carried out under the Reficar Commissioning Permit to Work system.	INFO	

1643. Reficar also cites to contemporaneous communications to prove that even after the signing of the Certificates, CB&I retained control of certain Units, *e.g.* through

[1705] Reply, para. 856.
[1706] Tr. 2256:13-2257:17.
[1707] CPHB2, responding to RPHB, paras. 172, 181-182; pdf p. 12.
[1708] Ex. R-2639, p. 2

controlling access to them[1709]. But the issue of controlling access to certain Units is not relevant to the discussion on when Mechanical Completion occurred. Correction of Punchlist items after Mechanical Completion would in any case require that CB&I had access to the Unit in question.

Fourth counterargument

1644. Reficar also avers that the minutes of a meeting between CB&I and Reficar from September 4, 2014, prove that signing of the Certificates by Reficar only meant that the Subsystems were ready for "pre-commissioning" but not for the other parts of PCS – commissioning and start-up[1710].

1645. Reficar's argument is another *non-sequitur*.

1646. Pre-commissioning is the first activity under "PCS"; the fact that the meeting minutes do not explicitly mention commissioning or start-up is irrelevant, since these activities are done sequentially; when Reficar accepted a Subsystem for the first activity, it accepted it for all subsequent PCS Work[1711].

Fifth counterargument

1647. Reficar finally argues that for Mechanical Completion to be achieved, CB&I needed to submit certain documents in a bundle called the "Mechanical Completion Package"; CB&I allegedly failed to do so prior to February 23, 2015[1712].

1648. The Tribunal notes that the submission of the documentation package was only required for the achievement of Final Completion, rather than for Mechanical Completion – two distinct concepts under the EPC Contract[1713].

1649. In any case, when Reficar signed the Certificate for each Subsystem, it specifically confirmed that "the supporting documentation [was] accepted"[1714]:

The above Sub-System has been completed along with all necessary tests and inspections, and a full joint punch has been undertaken. The applicable Punch Lists are attached.

The submitted Sub-System has been subjected to audit by Pre-Commissioning and the supporting documentation and Certification accepted.

The undersigned are approved representatives of the specified companies and departments per the completions authorized signature matrix (166000-000-GE-CP02-0002).

	CB&I CONSTRUCTION	CB&I QA/QC	REFICAR CONSTRUCTION	REFICAR PRE-COMMISSIONING
SIGNATURE				Mech Complet
PRINT NAME			A. GARCIA	R. Benavides
DATE	23 Dicembre	23/12/14	29-12-2014	30-Dic-14

* * *

[1709] R-1851_071_00033.
[1710] CPHB2, responding to RPHB, paras. 172, 181-182; pdf p. 12, citing to Ex. R-2638.
[1711] Ex. R-2638 refers to Punchlist items as "PLs".
[1712] ESOC, paras. 463-464.
[1713] See paras. 1591-1592 *supra*.
[1714] See by way of example Ex. R-1851_146_01654.

1650. As a result, the Tribunal upholds its finding that the Mechanical Completion of the Project was achieved on February 23, 2015.

4.3. ANALYSIS OF PARTY RESPONSIBILITY FOR DELAY

1651. The Tribunal will now make an analysis of the Project Schedule (**4.3.2.-4.3.5.**) applying a methodology derived from the reports prepared by both Parties' experts (**4.3.1.**).

4.3.1. METHODOLOGY

1652. There are two preliminary questions regarding the delay for which CB&I is responsible:

- first, whether CB&I should be held liable for the entirety of the Project delays (**A.**) and
- second, if the answer to the first question is in the negative, how to establish each Party's responsibility (**B.**).

A. Is CB&I responsible for the totality of delay?

1653. To establish overall delay in the Project Schedule, the Tribunal must calculate the difference in days between

- the Guaranteed Mechanical Completion Date (found to be February 28, 2013 under subsection **4.1.2.** *supra*), and
- the date of Mechanical Completion (found to be February 23, 2015 under subsection **4.1.3.** *supra*),

arriving at a total delay of 725 days[1715].

1654. The Tribunal has found in Section **4.2.1.** *supra* that CB&I was bound by an obligation of result to achieve Mechanical Completion by the Guaranteed Mechanical Completion Date.

1655. The Tribunal has previously[1716] also found that in cases of breach of contractual obligations, Art. 1604 of the CCC[1717] creates a presumption of negligence against the defaulting party; thus, the finding of 725 days of delay is sufficient to establish that CB&I *prima facie* breached its obligation of result.

[1715] This number will be subject to minor fluctuations on the basis of the analysis of detailed delay events in the subsequent subsections.
[1716] See paras. 807-815 *supra*.
[1717] CL-709; English translation:
"ARTICLE 1604. DEBTOR'S LIABILITY.
[…] The burden of proof of diligence or care lies with the party who should have used it; proving an Act of God is the burden of the party who alleges it.
All of which, however, is without prejudice to the special provisions of the laws, and to the express provisions of the parties.".

1656. The question now arises: should CB&I be held liable for the entirety of the delay?

1657. Strictly applying the first leg of CB&I's Schedule Control Commitments, the Tribunal could forego an analysis of attributing the responsibility for each of the specific delays on the Project and simply award to Reficar damages for all 725 days of delay. Such a solution would be reinforced by the Tribunal's finding in subsection **4.1.2** *supra* that CB&I never complied with the formal requirements under the EPC Contract to obtain an extension to the Guaranteed Mechanical Completion Date.

1658. The Tribunal, having considered this alternative in detail, finds that a strict attribution of all delay to CB&I, regardless of its cause, would be contrary to the Parties' intentions, as formalized in the Contract.

1659. First, TC 54.4 entitles CB&I to request an extension to the Guaranteed Mechanical Completion Date for "any act of prevention, interference, default or breach by any Owner Group member"[1718]. The Contract foresees the possibility of delay caused by the conduct of the Owner, and sanctions such conduct by extending the Guaranteed Mechanical Completion Date to the benefit of the Contractor.

1660. Second, the fact that CB&I was bound not only by an obligation of result, but simultaneously by one of best efforts, proves that the Parties did not intend to penalise CB&I for those delays for which Reficar was solely responsible; otherwise, the strict obligation of result would have sufficed; the additional obligations must be read in accordance with the *effet utile* principle, allowing CB&I some margin for those days of delay when, despite its best efforts, it bore no responsibility.

1661. This is consistent with the approach of both Parties' experts, both of whom assign responsibility to each Party for each of the delays, rather than simply attributing the sum of days solely to one or the other Party.

1662. On a final note, the Tribunal has only established CB&I's *prima facie* negligence in managing the Schedule; thus, CB&I must be granted the opportunity to disprove this preliminary finding.

1663. Summing up, when calculating the delay CB&I is responsible for, the Tribunal will take into account Reficar's responsibility for certain days of delay, and not consider the totality of delay as having arisen due to CB&I's negligence.

B. How to establish each Party's responsibility for the delay?

1664. Having established that CB&I will not be held accountable for delays caused by Reficar, the Tribunal must now establish a method for attributing delay to either Party.

The Experts' approach

1665. Long International ["**LI**"] and Secretariat adopt a different approach.

[1718] TC 54.4 (i), JX-002, p. 225, JX-004, pp. 201-202.

1666. LI used a "windows" or time slice approach to assess delays and improvements to the Project schedule in incremental periods of time, assuming that the critical path is dynamic and may change as delays occur during the execution of a project. LI took a discrete slice of time on the project and identified and evaluated delays and improvements that occurred during that period[1719]. It used schedules produced during the Project, but made adjustments under a schedule validation protocol[1720].

1667. LI's conclusions are set out in their March 2019 report as follows:

Table 7.8-1
Summary Table of EPC Project Windows and Delays

Window No.	Window Dates	Length of Window (CD)	Reliance Time on Longest Path	Forecast Project SAC Date	Total Delay Days (CD)	Compensable Days Reflect Recovery[1] (CD)	Compensable Days CD&E Recovery[2]	Concurrent Delay	CD&E : HOT Entitlement[3] (CD)	CD&E : HOT Entitlement[4] (CD)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	26 Apr 2010 through 22 Oct 2010	182	000	28-Feb-13	0	0	0	0	0	0
2	23 Oct 2010 through 19 Nov 2010	28	000 and 000 146	28-Feb-13	0	0	0	0	0	0
3.1	20 Nov 2010 through 25 Feb 2011	98	000 146	4-Sep-13	188	0	94	104	188	188
3.2	26 Feb 2011 through 20 May 2011	84	000 146	31-Aug-13	-4	-4	0	0	0	0
4	21 May 2011 through 17 June 2011	28	044	13-Nov-13	74	74	0	0	0	0
5	18 June 2011 through 29 July 2011	42	020	16-Oct-13	28	28	0	0	0	0
6.1	30 July 2011 through 21 Oct 2011	84	146	24-Sep-13	-22	-22	0	0	0	0
6.2	22 Oct 2011 through 29 Jan. 2012	98	146	13-Sep-13	-5	-5	0	0	0	0
6.3	28 Jan. 2012 through 24 Feb 2012	28	146	18-Sep-13	0	0	0	0	0	0
-	25 Feb 2012 through 20 Apr 2012	56	044	11-Oct-13	22	22	0	0	0	0
8	21 Apr 2012 through 18 May 2012	28	002	30-Dec-13	80	80	0	0	0	0
9	19 May 2012 through 27 July 2012	70	140 150 143	11-Dec-13	-16	-16	0	0	0	0
10	28 July 2012 through 24 Aug 2012	28	044	21-Dec-13	10	10	0	0	0	0
11	25 Aug. 2012 through 21 Sep 2012	28	143	30-Dec-13	9	9	0	0	0	0
12	22 Sep 2012 through 19 Oct 2012	28	137 134	15-Aug-14	228	161	55	21	15	*
13.1	20 Oct 2012 through 25 Jan. 2013	98	044	22-Aug-14	7	7	0	0	0	0
13.2	26 Jan. 2013 through 29 Apr. 2013	84	044	22-Aug-14	0	0	0	0	0	0
13.3	30 Apr 2013 through 28 June 2013	70	044	23-Aug-14	0	0	0	0	0	0
14.1	29 June 2013 through 27 Sep. 2013	91	002	4-Jan-15	286	252	31	3	31	34
14.2a	28 Sep 2013 through 24 Jan. 2014	119	002	31-Jan-15	39	0	39	0	39	39
14.2b	28 Sep 2013 through 24 Jan. 2014	119	002	31-Jan-15	-153	-93	-80	0	-80	-80
14.3	25 Jan. 2014 through 25 Apr. 2014	91	002	31-Dec-14	-31	-31	0	0	0	0
14.4	26 Apr. 2014 through 24 July 2014	90	002	24-Jan-15	24	24	0	0	0	0
15.1	25 July 2014 through 23 Oct. 2014	91	044	28-May-15	125	125	0	0	0	31
15.2	24 Oct. 2014 through 25 Jan. 2015	93	044	28-May-15	0	0	0	0	0	0
15.3	23 Jan. 2015 through 23 Apr. 2015	91	044	8-Oct-15	132	132	0	0	0	0
15.4	24 Apr. 2015 through 23 July 2015	91	110	15-Sep-15	-23	-23	0	0	0	0
16	24 July 2015 through 17 November 201	116	107, 130	17-Nov-15	63	63	0	0	0	0
				Total	992	781	99	133	283	198
	If CD AGE was executed			Change	[illegible]				0	
				Revised Total	661				283	

1 - Days for which LI did not request time
2 - Days for which Reficar is responsible
3 - Days of LI EAI entitlement by concession owner per CD&E/HOT analysis
4 - Days of LI EAI entitlement by concession owner per CD&E analysis

Secretariat

1668. Secretariat uses an "as planned versus as built windows" methodology, where the contemporaneous or actual critical path in each window is determined by "a common-sense and practical analysis of the available facts". The incidence and extent of critical delay in each window is then determined by comparing key dates along the contemporaneous or actual path against corresponding planned dates in the baseline programme. The Project records are then analysed to determine what delay events might have caused the identified critical delay[1721].

1669. Secretariat analysed six key units at the Project units on the Project from the time of the EPC Contract signature until the final SMCC was executed by Reficar. These units were:

[1719] LI ER, para. 873.
[1720] LI ER, para. 860.
[1721] Secretariat ER, para. 2.6.3.

a. Unit 002 – the Fluid Catalytic Cracking (FCC) Revamp Unit;

b. Unit 044 – the Hydrofluoric (HF) Alkylation Unit;

c. Unit 100 – the Integrated Crude and Vacuum Unit;

d. Unit 110 – the Hydrocracker Unit;

e. Unit 111 – the Delayed Coking Unit; and,

f. Unit 146 – the Tank Farm

1670. All of these units were late and these six units were the last to be completed, with Units 002 and 044 being the very last units to be finalized.

1671. A summary of Secretariat's conclusions for the last Unit, Unit 002, is as follows:

Windows	Critical Work in Window	Unit 002 Summary of Delay Table Causes of Delay	Delay in Window (days)	Cumulative Delay (days)
Window 1: 15 June 2010 to 18 April 2012	Delayed Pre-TAR work, namely construction of the pipe racks	• **Removal of Contaminated Soils:** Unidentified contaminated soils impacted the pre-TAR civil works and contractually required Reficar's removal. • **USO Led Labor Disruptions:** Throughout nearly the entire Project, employee labor disruptions (mainly from Colombia's oil industry union – USO, which consisted of many Ecopetrol employees) impacted CB&I's schedule work in the form of labor disputes, pulled work permits, delays in signing permits, harassment of non-union workforce and vandalism. • **ASER Steelwork Fabrication Delays:** ASER (a Reficar preferred steel fabricator) proved incapable of fabricating the necessary structural steel and meeting the delivery dates required for the pre-TAR pipe rack erection activities. • **Excessive Rainfall and Flooding:** Throughout 2010 and 2011 Cartagena received unexpected and excessive rainfall, leading to refinery-wide flooding and work stoppages that Reficar later considered a force majeure event.	89	89
	A longer than planned TAR period	• **Removal of Contaminated Soils:** Unidentified contaminated soils impacted the TAR civil works and contractually required Reficar's removal. • **USO Led Labor Disruptions:** Continued labor unrest (mainly from Colombia's oil industry union – USO, which consisted of many Ecopetrol employees) impacted CB&I's schedule work in the form of labor disputes, pulled work permits, delays in signing permits, harassment of non-union workforce, and vandalism. **Changes to the Scope and Timing of the TAR:** Due to several overlapping causes of delay leading to and during the TAR, the scope of the pre-TAR work was reduced, and the start of the TAR was delayed from March 2011 until January 2012. This resulted in disruptions, delays, increased costs, and additional risk in the execution of CB&I's work. • **Ecopetrol Crane Accident:** An Ecopetrol crane accident occurred on 20 February 2012 restricting work for 8 days during the Turnaround period.	23	112

Windows	Critical Work in Window	Unit 002 Summary of Delay Table Causes of Delay	Delay in Window (days)	Cumulative Delay (days)
Window 2: 18 April 2012 to 15 May 2013	Delayed Civil works in the Reactor / Regenerator area	• **Removal of Contaminated Soils:** Unidentified contaminated soils which impacted the start of civil works in the RX/RG areas and contractually required Reficar's removal • **Late Issuance / Approval of Information for TC-36000 Crane:** Limited and late information provided to CB&I impacted the mobilization of the Deep South TC-36000 crane, which was the largest crane utilized on the Project and had a limited availability window to perform critical heavy lifts	62	174
	Delayed Civil works in the Flue Gas / Turboexpander area	• **Slow Progress of the Piling Works:** Slow progress of the piling works relative to the planned progress rate formed by Reficar's imposed productivity assumptions and the adverse environment of the Project during this period (i.e. labor unrest, unidentified contaminated soils, increased piling quantities, etc) • **Increased Quantities:** Increased piling quantities stemming from an unfinalized FEED and related scope and design changes.	68	242
Window 3: 15 May 2013 to 1 February 2014	Delayed Steel work installation in the FG/TEX area	• **USO Labor Strikes & Related Disruptions:** Continued labor unrest (mainly from Colombia's oil industry union – USO, which consisted of many Ecopetrol employees) impacted CB&I's schedule work in the form of labor disputes, pulled work permits, delays in signing permits, harassment of non-union workforce, and vandalism. • **Explosions in the FCC Unit:** Starting in late August 2013, no work was performed until late October 2013 (or approximately 6 weeks) as a result of multiple explosions in the FCC unit. • **Increased Quantities:** Increased structural steelwork quantities stemming from an unfinalized FEED and related scope and design changes.	171	413

Window	Critical Work in Window	Unit 002 Summary of Delay Table Causes of Delay	Delay in Window (days)	Cumulative Delay (days)
Window 4: 1 February 2014 To 23 February 2015	Slow Progress of Piping in the RX/RG and FG/TEX area	• **Decline in Productivity:** Decline in piping productivity relative to the planned progress rate due to the adverse environment of the Project during this period (i.e. labor unrest, lack of skilled laborers, contract expirations, etc). • **USO Labor Strikes & Related Disruptions:** Continued labor unrest (mainly from Colombia's oil industry union – USO, which consisted of many Ecopetrol employees) impacted CB&I's schedule work in the form of labor disputes, pulled work permits, delays in signing permits, harassment of non-union workforce, and vandalism. • **Lack of Skilled Labor:** CB&I faced a lack of skilled labor on the Project due to the limited supply in the local market and Colombia. CB&I attempted to supplement the craft labor with laborers from nearby countries (or OCNs), however Reficar often limited or rejected CB&I's hiring efforts as it preferred to exhaust the local labor pools and train them to perform the highly specialized skillsets such as welding and pipefitting. • **Expiration of Labor Contracts (including 4th Term):** Despite CB&I's request for Reficar to renew fixed-term employment contracts, including fourth term contracts which would require a minimum one year extension; Reficar preferred CB&I proceed with terminations and recruit new laborers. Additionally, CB&I was instructed to prioritize contracts for Colombian workers over foreign nationals (or OCNs), who often lacked the necessary specialized skillset needed to perform works towards the end of the Project. • **Increased Quantities:** Increased piping quantities stemming from an unfinalized FEED and related scope and design changes.	228	641
	Slow Progress of E&I work in the RX/RG and FG/TEX area	• **Decline in Productivity:** Decline in E&I productivity relative to the planned progress rate due to the adverse environment of the Project during this period (i.e. labor unrest, lack of skilled laborers, contract expirations, etc). • **USO Labor Strikes & Related Disruptions:** Continued labor unrest (mainly from Colombia's oil industry union – USO, which consisted of many Ecopetrol employees) impacted CB&I's schedule work in the form of labor disputes, pulled work permits, delays in signing permits, harassment of non-union workforce, and vandalism. • **Lack of Skilled Labor:** CB&I continued to face a lack of skilled labor on the Project due to the limited supply in the local market and Colombia. CB&I attempted to supplement the craft labor with laborers from nearby countries (or OCNs), however Reficar often limited or rejected CB&I's hiring efforts as it preferred to exhaust the local labor pools and train them to perform the highly specialized skillsets such as welding and pipefitting. • **Expiration of Labor Contracts (including 4th Term):** Despite CB&I's request for Reficar to renew fixed-term employment contracts, including fourth term contracts which would require a minimum one year extension; Reficar preferred CB&I proceed with terminations and recruit new laborers. Additionally, CB&I was instructed to prioritize contracts for Colombian workers over foreign nationals (or OCNs), who often lacked the necessary specialized skillset needed to perform works towards the end of the Project. • **Increased Quantities:** Increased E&I quantities stemming from an unfinalized FEED and related scope and design changes.	84	725

Criticism by the Parties

1672. Reficar argues that the analysis of delay by CB&I's expert is untrustworthy, as it is based on the "as-planned versus as-built" methodology, which is not appropriate for long and complex projects such as the Refinery modernisation and expansion[1722]. Reficar adds that the results of the analysis are unreliable because CB&I's expert[1723]:

- failed to establish the critical path for each of the analysed windows, and
- rejected CB&I's monthly schedule updates as the basis for the calculations.

1673. CB&I, on the other hand, argues that the delay analysis performed by Reficar's expert is unreliable, because it attributes all delay for which it cannot establish the cause solely to CB&I[1724]; additionally, the expert's analysis is flawed due to Reficar's biased instructions, such as to attribute all labour-relations-related delays fully to CB&I[1725], and finally because the expert's analysis is limited to[1726]

- As-planned information in CB&I's schedule forecasts rather than an analysis of actual delays, and

[1722] CPHB, para. 146.
[1723] CPHB, paras. 146-150.
[1724] RPHB, para. 221.
[1725] RPHB, para. 210.
[1726] RPHB, paras. 189, 196-201.

- The single activity on the longest path in the schedule at the end of a delay window rather than all activities.

Discussion

1674. As a starting point, not all delays are equal: delays affecting the "critical path" are especially relevant. While there is no Contract definition, the term still plays a major role in the Parties' schedule obligations: under TCs 26.1.3[1727] and 54.4[1728], only events impacting the critical path could lead to an extension of the Guaranteed Mechanical Completion Date.

1675. The AACE, recognised by both Parties as an authority in the engineering and construction disciplines, defines the critical path as[1729]

> "[…] the longest logical path through the [critical path method] network [which] consists of those activities that determine the shortest time for project completion. Activities within this or [sic] list form a series (or sequence) of logically connected activities that is called the critical path. A delay to the start or completion of any activity in this critical path results in a delay to project completion, assuming that this path consists of a continuous sequence of activities without an overriding date constraint or multiple calendars" [Emphasis added].

1676. As a result, the Tribunal's analysis of delays will be limited to those activities which impacted the critical path, or the longest path that affected completion of the Project and thus caused a postponement of the Mechanical Completion Date.

1677. The Parties' delay experts have used different methodologies to assess the responsibilities for delay to be imputed to Reficar and CB&I – and arrive at markedly different conclusions.

1678. Whilst there are criticisms which can be made of the use of one method of analysis rather than another, the Tribunal will consider the results of the analyses by LI and Secretariat to see whether it is necessary to amend the methodology:

- The analysis by LI looks, in any window, at the predicted delay to Mechanical Completion based on CB&I's schedules at that date; there is an issue as to whether those schedules were accurate or suppressed details at the request of Reficar;

[1727] JX-002, p. 202, JX-004, p. 185:
"[…] If there is any delay in the entry, by the Owner, into a Purchase Offer of the kind referred to in this TC26.1.3, and such delay is not attributable to the Owner or does not affect the critical path of the Work there shall be no change to the Guaranteed Completion Date. If there is any delay in the entry, by the Owner, into a Purchase Offer of the kind referred to in this TC26.1.3, and such delay is attributable to the Owner and does affect the critical path of the Work, the Contractor shall be entitled give a Written Notice to the Owner in accordance with TC54.2 requesting an extension of time to the Guaranteed Completion Date."
[1728] JX-002, p. 224, JX-004, p. 201:
"Subject to the other provisions of this TC54, the Contractor shall only be entitled to request an extension of time to the Guaranteed Completion Date where any of the following events impact the critical path of the Work as shown in the then current Schedule and as a result the achievement of Mechanical Completion of all of the Units is delayed: […]"
[1729] LI ER, Pub. Art. Exh. LI-014, pdf p. 3.

- Secretariat's analysis starts with the October 2010 Schedule and calculates actual delay by reference to that programme rather than an updated programme.

1679. Secretariat's analysis focuses on actual contemporaneous delay, while LI's analysis relies on projections, and consequently the Tribunal will in general first follow the more convincing approach by Secretariat, and adjust it using LI's analysis, whenever appropriate[1730].

1680. The Tribunal will focus its analysis on those activities which constituted the critical path. And for these activities it is indeed possible to make a direct comparison of delay using the two methods which the delay experts have used:

- In LI's analysis, the critical path for Window 4 (May 21, 2011) through Window 15.3 (April 23, 2015) passes through Units 146, 044 or 002[1731];

- Secretariat's analysis agrees that Units 146, 044, and 002 lie on the critical path[1732].

1681. The Window calculation is not a strict science. The Tribunal has broken down the actual duration of the Works into four periods that best reflect major milestones on the Project:

- Period 1 from June 15, 2010 to February 24, 2012 – the signing of the Contract until the Cut-Off Date[1733] **(4.3.2)**;

- Period 2 from February 25, 2012 to May 15, 2013 – the Cut-Off Date until May 15, 2013 **(4.3.3)**;

- Period 3 from May 15, 2013 to February 1, 2014 **(4.3.4)**; and

- Period 4 from February 1, 2014 to February 23, 2015 **(4.3.5)**.

1682. It is thus possible to make a direct comparison of delay, taking into account the two methodologies proposed by the experts, notwithstanding the fact that the Tribunal's division of Periods does not exactly correspond to the Windows used by either of the experts – some Periods will overlap with a certain Window, some will fall short; these discrepancies are, in any event, minor.

4.3.2. PERIOD 1

1683. The critical path delays experienced during this period affected Unit 146 (**A.**) and Unit 044 (**B.**).

[1730] The Tribunal notes that LI's approach sometimes leads to counterintuitive conclusions, such as total delays being negative; see *e.g.*, Windows 3.2, 5 and 6.1 under LI ER, Table 7.8-1.
[1731] Except for incidental Windows 5, 9, 11 and 12.
[1732] In the windows when these units do not lie on the critical path, they are still near critical.
[1733] The Tribunal is aware that the precise Cut-Off Date was December 31, 2011; however, to accommodate for the experts' calculations, the Tribunal for the purposes of the current section assumes that February 24, 2012 constitutes an appropriate reflection of the delays as of the Cut-Off Date.

A. Unit 146 (June 15, 2010 to February 11, 2011)

1684. The delay in Unit 146 was caused by the Tanks and Spheres scope of work – an area which has already been analysed by the Tribunal as one of the Excluded Costs. The tanks modification works were completed later than anticipated by CB&I, due to the following facts:

- Reficar took the decision to carry out an inspection of the tanks late – an activity necessary to obtain data for the modification works; by the time the inspection was conducted, the modification works should have already finalised; in fact, the revised outage plan for the tank modification works was scheduled according to the inspection report after the planned completion date[1734].

- The late issuance of the report impacted the schedule of the tender process for the selection of the subcontractor; the subcontractor package was rescheduled by four months[1735].

1685. Both experts accept that the above facts impacted the Works on Unit 146 and Reficar's expert concedes that 188 days should be credited to CB&I as excusable delay[1736].

B. Unit 044 (June 15, 2010 to July 1, 2012)

1686. The following causes for delay have been advanced:

- Unit 044 experienced late design changes, such as the inclusion of several required processes, the alteration of the size of the neutralization basin, the addition of a new water curtain system; all these modifications directly impacted the works schedule[1737];

- Furthermore, as already seen in the analysis of Excluded Costs, Reficar decided to purchase recycled pumps from the Big West refinery, instead of new ones, resulting in the need to acquire additional equipment to make up for the poorer technology[1738];

- There was a change in sequence between the pipe rack steel erection and setting of equipment, likely due, at least in part, to the effects of a congested plot plan and the changing of the pumps; the fact is that the start of steel deliveries was delayed by about two months[1739];

- Finally, a decline in steel productivity relative to the planned progress is also noted[1740].

[1734] LI ER, Appendix 7K, paras. 48, 51; Secretariat ER, Appendix G, para. 1.2.6.
[1735] LI ER, Appendix 7K, paras. 52, 53; Secretariat ER, Appendix G, para. 1.2.6.
[1736] LI ER, Appendix 7K, paras. 47, 50; Secretariat ER, Appendix G, para. 1.2.6.
[1737] Secretariat ER, Appendix C, para. 1.3.5.
[1738] Secretariat ER, Appendix C, para. 1.1.18.
[1739] Secretariat ER, Appendix C, para. 1.3.8.
[1740] Secretariat ER, Appendix C, table p. 20.

1687. LI only accepts 74 days as compensable delay, but for a different reason: the late delivery of a substation[1741]; however, ultimately, both experts seem to agree that such late delivery never caused a real delay, as it did not impact on the critical path[1742].

1688. According to Secretariat, the delay adds to 155 days[1743]. The Tribunal is, however, only prepared to grant 20 additional days of excusable delay because:

- The Tribunal has already accepted 188 days of excusable delay for events occurring until February 11, 2011: it is difficult to assess to what extent the 155 days of delay in Unit 044 for events extending over until July 1, 2012 are already encompassed in those 188 days; the Tribunal notes that, if delays were caused homogeneously over time, 32%[1744] would have already arisen during the first tranche;

- Certain delays analysed in the Windows chosen by the Parties would also go beyond Period 1, which ends on February 24, 2012 and, thus, will likely be encompassed in the delay caused in Period 2 to be analysed in the next chapter;

- Although a variety of events causing delay did lie outside CB&I's scope of responsibility, the decline in the steel productivity seems to be another concurrent factor, which is not completely excusable.

* * *

1689. Thus, in the relevant period there were two delays which affected the critical path to the project and for which Reficar was responsible:

- 188 days of delay to Unit 146 and

- 20 days to Unit 044.

The Tribunal therefore concludes that the critical path delay up to the end of this period was likely to be a combination of the delays to these two units, as LI indicates; thus, overall, the Tribunal considers that the delay is in line with that which CB&I assessed in its Representation Forecast[1745], which was 203 days.

4.3.3. PERIOD 2

1690. The Tribunal has established that for Period 2, the relevant dates are February 25, 2012 to May 15, 2013.

[1741] LI ER, Appendix 7K, para. 131.
[1742] LI ER, Appendix 7K, para. 144; Secretariat ER, Appendix C, para. 1.2.8.
[1743] Secretariat ER, Appendix C, para. 1.2.10.
[1744] June 15, 2010 to July 1, 2012 is 747 days. 15 June, 2010 to February 11, 2011 is 241 days. 241 days /747 days is 32%.
[1745] Ex. C-0088, p. 4.

1691. There was an overall delay of 236 days[1746] to Unit 044, the only unit on the critical path in Period 3, which can be broken down in two portions:

A. Slow process of steel erection

1692. First, there was a 133 day delay because of the slow progress of steel erection[1747].

1693. This slowness could be attributable to the fact that the amount of pipe rack steel installed almost tripled to 874 tons, and more than tripled (to 690 ton) for the other major structures[1748]. The exact causes for this significant increase are unknown. The Tribunal accepts, however, that very little pipe rack structural steel from the Big West purchase could be used and that replacement steel was required. While there is some discussion whether CB&I could have anticipated the need for replacement steel, the contemporaneous correspondence between the Parties shows that the issue was settled, with Reficar accepting responsibility for the late issuance of the purchase order for additional Unit 044 structural steel.

1694. In general, the Big West purchase, resulting in changes to the plot plan and requiring field adaptations, must have impacted CB&I's sequencing and logistics: the replacement steel was delivered late and, furthermore, the new equipment required refurbishment. The Tribunal, however, notes that the disruptions created by the Big West purchase were already prevalent in prior Windows and, therefore, some of the delay now claimed as excusable has already been captured in the analysis of such Windows.

1695. All in all, the Tribunal finds that it is fair that 52 days out of the 133 days of delay should be considered excusable. CB&I is thus responsible for 81 days[1749] of delay.

B. Postponement in start to piping

1696. Second, there was a 103 days delay because of postponement in the start to piping[1750].

1697. CB&I's expert says that the principal cause for this delay was the lack of skilled labour, due to a variety of factors, including[1751]

- that Reficar preferred to exhaust the local labour pools and train local workers to perform highly specialized skillsets, such as welding and pipefitting,

- that Reficar preferred that employment contracts be terminated and new laborers recruited, rather than extending employment terms, and generally,

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[1746] The Tribunal notes that Secretariat has calculated the delays to Unit 044 in Window 2 at 139 and 107 days for the causes analysed by the Tribunal under A and B. Due to the difference in Period 2 and Window 2 analysed by Secretariat, the Tribunal has slightly modified the duration of the delays to harmonise them with the Periods it has established.
[1747] Secretariat calculates this delay at 139 days, see Secretariat ER, Appendix C, paras. 1.4.2-1.4.4.
[1748] Secretariat ER, Appendix C, para. 1.4.12.
[1749] 139-54=85
[1750] Secretariat calculates this delay at 107 days, see Secretariat ER, Appendix C, paras. 1.4.5-1.4.11.
[1751] Secretariat ER, Appendix C, para. 1.4.10.

- that labour disruptions continued.

1698. These reasons seem rather unconvincing: the Tribunal has already determined, when analysing the Excluded Costs, that the hiring of local work force was a contractual obligation and that CB&I's inefficiencies led to the hiring of an unmanageable workforce, and that only a small fraction of disruptions which occurred after the Cut-Off Date were attributable to Reficar (see Section VII.2.1.3.3.3.F *supra*).

1699. In view of these, the Tribunal opines than an appropriate allocation of delay is 32 days as excusable delay, attributable to the Owner, and that 71 days correspond to CB&I's responsibility.

Critical path

1700. The experts discuss whether it was Unit 137 (Process & Utilities Interconnecting Piping), rather than Unit 044, which was on the critical path.

1701. LI used the October 2012 schedule update to promote Unit 137 to the critical path[1752]. Secretariat disagrees[1753]: Unit 137 appears on LI's critical path only once, and for a period of less than a month; considering its nature, it is Secretariat's opinion that it was not a practical assessment for Unit 137 to be critical.

1702. The Tribunal, on this issue, sides with Secretariat: pursuant to LI, Unit 044 was the next most critical unit in this Window, and it was critical in the preceding and following Windows, a factor which reinforces that it was this Unit which, in fact, represented the critical path.

* * *

1703. In sum, the Tribunal has found that for Period 2, 84 days[1754] are excusable, with CB&I being responsible for the remainder of 152 days[1755].

4.3.4. PERIOD 3

1704. The Tribunal has established that for Period 3, the relevant dates are May 15, 2013 to February 1, 2014.

1705. There was a total delay of 171 days within this period affecting Unit 002, the only one on the critical path.

1706. The experts confirm that the main causes for the delay were:

- Labour disruptions and a strike[1756], and

[1752] See LI ER, Appendix 7K, paras. 410 *et seq.*
[1753] Ex. R-0026, Secretariat ER, para. 3.3.19.
[1754] 52+32=84
[1755] 81+71=152
[1756] LI ER, Appendix 7K, paras. 539 et seq.; Secretariat ER, Appendix B paras. 1.5.8 *et seq.*

- Shutdown following an incident involving an explosion while Ecopetrol employees were doing maintenance, which put the work on halt through the month of September and into early October[1757].

1707. There is one additional, secondary cause, advanced by each expert:

- LI says that, in relation to piping, electrical and instrumentation, progress was delayed due to subcontractor issues, quantity growth, and availability of materials – all areas for which CB&I was responsible[1758];

- Secretariat notes that the steelwork quantities increased due to an unfinalized FEED and related scope and design changes in Unit 002, which fall under Reficar's responsibility[1759].

1708. The Tribunal has already found that the labour disruptions and the strike that were ultimately resolved with the signing of the Bargaining Agreement [see Section on Improper Costs] were predictable for CB&I, and thus, did not give rise to Excluded Costs, except for a very small portion – similarly, they cannot now be the source for Reficar's responsibility.

1709. The shutdown after the explosion, however, seems to be within Reficar's scope of responsibility, as it was caused during the performance of Ecopetrol's employees. As to the other two ancillary causes, the first seems to be attributable to CB&I, the second to Reficar.

* * *

1710. Taking all the above into account, the Tribunal finds that, out of the 171 days of delay:

- 85 days are attributable to Reficar's responsibility and

- 86 days to CB&I's responsibility.

4.3.5. PERIOD 4

1711. For Period 4, the relevant dates are February 2, 2014 to February 23, 2015, which is the Mechanical Completion Date; thus, the delay amounts to 115 days.

1712. Only Unit 002 lay on the critical path in Period 4, as it was the last Unit to obtain the SMCC.

1713. The main factors advanced by Secretariat have already been rejected by the Tribunal as giving rise to excusable delay:

- Slow progress of piping due to labour disruptions and strikes[1760];

[1757] LI ER, Appendix 7K, paras. 564 et seq.; Secretariat ER, Appendix B, paras. 1.5.21 *et seq.*
[1758] LI ER, Appendix 7K, paras. 552 *et seq.*
[1759] Secretariat ER, Appendix B, paras. 1.5.31 *et seq.*
[1760] Secretariat ER, Appendix B, paras. 1.6.16 *et seq.*

- Lack of skilled labours[1761].

1714. There is an ancillary cause, which the Tribunal has accepted, which is the increased piping quantities stemming from an unfinalized FEED and related scope and design changes[1762]. However, part of the delay caused by this factor will already be encompassed in prior excusable delays.

1715. LI, on the other hand, points to an additional cause for the continued erosion in the productivity factor: CB&I's decision in August 2014 to increase the activity "Complete Piping" for a major pipe rack by 200 days. The expert says that they found no documentation explaining why CB&I did so, while simultaneously reducing the overall manhours[1763].

1716. The Tribunal notes that, all in all, the experts agree that there was little progress during this period, which arose from poor productivity.

* * *

1717. Having considered the evidence marshalled, the opinion of the experts, and its own previous findings, the Tribunal resolves that, of the 115 days suffered by Unit 002:

- 19 days are Reficar's responsibility and

- 96 days are CB&I's responsibility.

4.4. CONCLUSION ON DELAY CAUSED BY CB&I

1718. Based on the above analysis, the Tribunal finds the following allocation of delay during the period up to Mechanical Completion on February 23, 2015:

Period	Overall Delay	CB&I Responsibility	Reficar Responsibility
1: June 15, 2010 to February 25, 2012	203 days	0 days	203 days
2: February 25, 2012 to May 15, 2013	236 days	152 days	84 days
3: May 15, 2013 to February 1, 2014	171 days	86 days	85 days
4: February 1, 2014 to February 23, 2015	115 days	96 days	19 days
Total	725 days	334 days	391 days

[1761] Secretariat ER, Appendix B, paras. 1.6.29 *et seq.*
[1762] Secretariat ER, Appendix B, paras. 1.6.51 *et seq.*
[1763] LI ER, Appendix 7K, paras. 769 *et seq.*

Total – Post-Cut-Off Date	522 days	334 days	188 days

1719. Thus, the *prima facie* finding of CB&I's breach of its Schedule Control Commitments is confirmed: a detailed analysis shows that, post-Cut-Off Date, CB&I is responsible for 334 days of delay – while 188 days of delay were caused by events under Reficar's responsibility.

Legal consequences

1720. What are the legal consequences of these findings?

1721. The Tribunal has already established the consequences of the delay caused by Reficar: CB&I has been granted USD 157.1 million[1764] of prolongation costs for the 188 days of delay caused by Reficar after the Cut-Off Date[1765], which are part of the Excluded Costs.

1722. What remains to be decided are the legal consequences of the 334 days of delay imputable to CB&I. The Tribunal has already explained that under the EPC Contract, the penalty for CB&I's failure to meet its obligation of result to achieve Mechanical Completion by the Guaranteed Mechanical Completion Date is the accrual of Delay Liquidated Damages, to be calculated on each day of tardiness.

1723. The tariff for calculating Delay Liquidated Damages is provided under TC 54.8[1766]:

> "54.8.1 Subject to TC54.8.1A, if the Contractor fails to achieve Mechanical Completion of all of the Units by the Guaranteed Completion Date, the Contractor shall be liable to pay Delay Liquidated Damages for each Day from the Day immediately following the Guaranteed Completion Date up to and including the date Mechanical Completion of all of the Units is achieved, at the following rates per Day:
>
> (i) at the rate of two hundred and sixty two thousand five hundred Dollars (US$262,500) per Day for the first 60 (sixty) Days of such delay; and then
>
> (ii) at the rate of five hundred thousand Dollars (US$500,000) per Day for each Day of such delay thereafter […]".

1724. Pursuant to this rate, the total delay caused by CB&I of 334 days needs to be broken down into two parts:

- The initial 60 days, where the applicable tariff is USD 262,500 per day, amounting to a total of USD 15.75 million, and
- The remainder of 274 days[1767], with a tariff of USD 0.5 million per day, amounting to a total of USD 137 million.

[1764] 771,283*193=148.86 million
[1765] See para. 1348 *supra*.
[1766] JX-002, p. 226; JX-004, p. 203.
[1767] 334-60=274.

1725. Thus, the totality of Liquidated Delay Damages amounts to USD 152.75 million.

[The Tribunal flags at this point that TC 54.8.1 (ii) contains a limitation of liability[1768] and that the application of such Liability Cap will be addressed in the Quantum Section of this Award.]

VII.2.4. WORK COMPLETION COSTS

1726. There is another claim by Reficar[1769], whose underlying facts are intertwined with those of the Improper Delay Claim, namely the costs of completing the EPC Works that CB&I should have performed under the EPC Contract, but which were finalized by Reficar's PCS contractors ["**Work Completion Claim**"].

1727. Under this section, the Tribunal will analyse Reficar's request for damages related to moneys paid to third party contractors, who either completed or corrected CB&I's Work under the EPC Contract. Although this claim has a rework component, it is different to that one of rework that the Tribunal considered as one of the potential Excluded Costs as argued by CB&I[1770]: that claim related to amounts actually paid to CB&I for performing rework; whilst the Work Completion Claim does not involve a claw back, the moneys now claimed were never paid to CB&I but to the contractors that actually carried out the work completion.

1728. Reficar quantifies its Work Completion Claim as follows[1771]:

- USD 1.61 million[1772] for the PCS contractors completing incomplete EPC work,
- USD 8.69 million[1773] for the PCS contractors correcting defects in CB&I's EPC work, and
- USD 10.32 million for "additional impacts to PCS contractors due to CB&I failing to complete construction and deliver systems and units on committed dates", which includes discrete numbers for either completion or correction works.

1. THE PARTIES' POSITIONS

1729. Reficar argues that CB&I failed to provide the Works in a complete state and free of defects[1774]. According to Reficar, since CB&I failed to meet its Wok Completion

[1768] JX-002, p. 226; JX-004, p. 203.
[1769] The Tribunal notes that these claims are referred to as claims for "Improper PCS costs" by Reficar, see e.g., but in fact the claim is for the completion of EPC Works rather than PCS Works; the only connection is that it was Reficar's PCS contractors that completed the EPC Works CB&I refused to finalize.
[1770] See Section VII.2.1.3.3.3.B.h *supra*.
[1771] CPHB, para. 404.
[1772] The Tribunal notes that Claim Category 19 "PCS Completion of Outstanding and Incomplete Work" amounts to USD 1.61 million according to CPHB, para. 404; this amount was updated during the JER exercise from the initial amount of USD 1.5 million.
[1773] The Tribunal notes that Claim Category 20 "Cost for PCS Contractors to Correct Defects in CB&I's Work" amounts to USD 8.69 million according to CPHB, para. 404; this amount was updated during the JER exercise from the initial amount of USD 5.2 million.
[1774] CPHB, paras. 397, 401-402, Reply, para. 852, ESOC, paras. 467, 474, 640-641.

obligations, Reficar needed to ask its PCS contractors to perform the completion and correction of the Works.

1730. First, Claimant argues that CB&I should first pay to Reficar the additional costs that Reficar paid to its PCS contractors to finalize CB&I's EPC Work (calculated as the difference between the man-hour rate charged by CB&I and those PCS contractors)[1775].

1731. Second, Reficar says that when it started PCS activities, it discovered that some of the Works delivered by CB&I were defective[1776]. When asked to cure these defects, CB&I refused. Thus, Reficar argues that CB&I should compensate Reficar for the entirety of cost incurred by the PCS contractors in performing corrective works that cured the deficiencies in the Works performed by CB&I[1777].

1732. CB&I says it delivered complete Works which were free of defects[1778].

1733. First, CB&I says that it was Reficar's conscious decision to pass on certain final work after Mechanical Completion from CB&I to the PCS contractors; there is no reason for CB&I to bear the costs of that decision[1779].

1734. Second, CB&I says its make-good obligations under the EPC Contract were limited by detailed notice requirements under strict time limits to be complied with by Reficar and which Reficar failed to meet[1780]. CB&I also argues that Reficar accepted care, custody and control of Project subsystems and is thus now barred from bringing claims as to any defects in CB&I's Works[1781]. According to CB&I, the defects identified by Reficar arose from the damage and preservation failures caused by Reficar or its PCS contractors[1782].

2. DISCUSSION

1735. The Tribunal will now address Reficar's allegations that CB&I breached two major obligations under the EPC Contract, namely to deliver the Works:

- First, in a state of completion (**2.1**), and
- Second, free of defects (**2.2**).

2.1. DELIVERY OF COMPLETE WORKS

1736. Reficar argues that CB&I was obligated to finalise the Works under the EPC Contract but never did so[1783]; Reficar goes so far as to argue that CB&I never achieved full Mechanical Completion, because it demobilized from the site leaving

[1775] LI ER, paras. 1340-1370.
[1776] Reply, para. 861, ESOC, paras. 474-476.
[1777] LI ER, paras. 1340-1348,1371-1381.
[1778] RPHB, paras. 452-454, 456, 462.
[1779] ESOD, para.1085.
[1780] RPHB, paras. 456-458.
[1781] RPHB, para. 462.
[1782] RPHB, para. 462, ESOD, paras. 1084-1085.
[1783] CPHB, paras. 396, 400.

Reficar's PCS contractors to complete the Works[1784]. As a result, Reficar claims the difference in the amounts between[1785]

- the amounts it would have paid to CB&I for the completion works, and
- the amounts it actually paid to its PCS contractors for doing so instead of CB&I.

1737. CB&I argues that the Works it delivered were complete, as attested by Reficar through the signing of each completion Certificate at the Subsystem level[1786]. When Reficar accepted the Subsystems as mechanically complete, it assumed the risk of any pending completion works; CB&I should not bear the burden of Reficar's decision to grant completion work to PCS contractors[1787].

1738. The Tribunal will side with CB&I.

1739. In arriving at this decision (**B.**), the Tribunal will first interpret the Contract provisions (**A.**).

A. Contract provisions

1740. The Tribunal has previously analysed the Contract provisions on Final Completion (as opposed to Mechanical Completion); *pro memoria*, Final Completion meant that Works were not only mechanically complete, but also that all the remaining construction activities were finalised, and the required documentation delivered to Reficar[1788].

1741. The Contract also provides for different sanctions for CB&I's failure to comply with Mechanical Completion (i.) and Final Completion (ii.).

1742. (i.) The delay penalties under the Contract concerned Mechanical, rather than Final Completion; under the Liquidated Delay Damages clause CB&I would pay a daily rate for each day between the Guaranteed Mechanical Completion Date and the date of Mechanical Completion of the Project, as discussed in the preceding Section.

1743. (ii.) By contrast, not achieving Final Completion would not result in damages, but would instead bar CB&I from obtaining a part of the final tranche of the Contractor's Fixed Fee, pursuant to TC 54.8.8[1789]:

> "54.8.8 Upon the attainment of Mechanical Completion of all of the Units, the Parties shall agree the cost of rectifying all of the outstanding items on the Punchlist (the "Punchlist Value"). Following the agreement of the Punchlist Value, the Owner shall, in accordance with TC58, pay the Contractor the final portion of the Contractor's Fixed Fee less the Punchlist Value. Upon Final

[1784] ESOC, para. 467.
[1785] CPHB, para. 404, citing to LI ER, paras. 1349-1370.
[1786] RPHB, paras. 452-454, 459-462.
[1787] ESOD, para. 1085.
[1788] See Tribunal's analysis at para. 1591 *supra* on the basis of TC 1 "Final Completion" at JX-002, p. 165; JX-004, p. 150.
[1789] JX-002, p. 227; JX-004, p. 204.

> Completion, the Owner shall, in accordance with TC58, pay the Contractor the Punchlist Value" [Emphasis added].

1744. Such an interpretation is buttressed by TC 7.3, which stipulates that CB&I would perform Works in consideration of payment by Reficar[1790]:

> "In consideration of payment by the Owner the Contractor shall, subject to the provisions of this Agreement and in accordance with the Scope of Work, carry out and complete all the Work in accordance with this Agreement and shall regularly and diligently proceed with the Work to achieve Mechanical Completion by the Guaranteed Completion Date" [Emphasis added].

1745. The Contract definition of "Works" suggests that CB&I was obligated to rectify all Punchlist items and defects, after Mechanical Completion[1791]:

> "'Work' means all obligations, goods, services, tools, equipment, and other items to be performed or furnished by the Contractor, as more fully set out in the Scope of Work, including rectification of all items on the Punchlist and all Defects and performance of any FCC Post Turnaround Work" [Emphasis added].

B. Decision

1746. Unlike for the correction of defects, there is no Contract provision stating that any outstanding works, after Mechanical Completion, would necessarily have to be performed by CB&I. Thus, while CB&I was, in general, obligated to rectify Punchlist items and other defects after Mechanical Completion, the Contract was flexible and allowed Reficar to adjudicate other pending work within CB&I's scope of performance to a different contractor if it so wished.

1747. The contemporaneous evidence shows that Reficar exercised this choice, and that CB&I respected it:

1748. First, a presentation attached to Reficar's BofD Meeting from August 2015 states that certain completion works would be assumed by Reficar to maintain the Schedule[1792]:

> "A plan of execution was established with CBI identifying which actions will be finalized by CBI and which will be assumed by Reficar to maintain the start-up schedule".

1749. Second, further evidence is provided in a Jacobs report from 2015, in which the consultancy observed that Reficar's PCS contractors were taking over CB&I's completion work at a higher cost to Reficar[1793]:

[1790] JX-002, p. 179; JX-004, p. 164.
[1791] JX-002, p. 171; JX-004, p. 157.
[1792] Ex. R-1432, p. 5: "*Se estableció plan de ejecución con CBI identificando que acciones serán finalizadas por CBI y cuáles serán asumidas por Reficar para mantener cronograma de arranque*"; English at p. 24.
[1793] Ex. R-0014, pdf p. 79; for Spanish, pdf pp. 29-30:

> "For some of the [sub]systems which were not completed, the commissioning contractor undertook the responsibility of completing them, which transferred the work from the construction budget to the commissioning budget (an additional owner cost)".

1750. Third, there is also direct evidence showing that Reficar instructed CB&I not to perform certain completion works because its PCS contractors would do so:

- an email from Reficar to CB&I from March 2015 in which Reficar requested CB&I not to install sprinklers in the tank farm: Reficar's PCS contractor was taking care of cleaning the piping, and offered to perform the installation of the sprinklers and Reficar agreed to this change in strategy[1794];
- a letter from CB&I dated February 2015 requesting confirmation that certain completion works, including the installation of a perimeter fence and CCTV cameras, were removed from CB&I's scope of work[1795];
- a letter from Reficar dated April 2015 confirming the de-scoping of CB&I's completion work[1796].

1751. The evidence points to Reficar choosing to expedite its PCS activities through accepting as mechanically complete Subsystems with outstanding major construction items and later instructing its PCS contractors to finalize CB&I's work – although the PCS contractors were more expensive than CB&I.

1752. Reficar now claims that CB&I was obligated to finalize the Works under the EPC Contract in order to achieve "Full Mechanical Completion"[1797] and that it is entitled to claim from CB&I compensation for the additional costs incurred when it engaged the PCS contractors to do the completion works.

1753. Reficar is, however, wrong: CB&I is not to be held liable for any damages stemming from the completion works as it was not responsible for works arising after Mechanical Completion. Reficar accepts this, but creates an artificial distinction between "full" and "partial" Mechanical Completion, arguing that these completion works would be carried out after partial Mechanical Completion, but before full Mechanical Completion was accomplished.

1754. The Tribunal has already rejected this purported interpretation: Reficar accepted as mechanically complete Subsystems with outstanding "A" Check Sheet and Category "A" Punchlist items, *i.e.*, Subsystems that still required certain key

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"*Para algunos de los subsistemas que no estaban completos, el contratista de puesta en marcha asumió la responsabilidad de completar los subsistemas que transfirieron el trabajo del presupuesto de construcción al presupuesto de puesta en marcha (un costo más para el dueño)*".

[1794] Ex. R-2641, p. 10:
"The sprayers of the deluge system of the spheres and pumps should not be installed and should be delivered. We will install them with [PCS Contractor] after the piping has been cleaned".
See p. 4 in original:
"*Los aspersores del Sistema de diluvio de las esferas y las bombas no sean instaladas y sean entregadas. Nosotros las instalaremos con [PCS Contractor] después de la limpieza de la Tubería*".

[1795] Ex. R-1849_09732.

[1796] Ex. R-1849_14538.

[1797] CPHB, paras. 395-396.

construction elements to be completed; the "partial" Mechanical Completion put forward by Reficar was not acknowledged in the completion Certificates themselves or anywhere in the Contract; and, on the basis of the available evidence, the Tribunal has determined that Reficar's signing of the completion Certificate at either the Unit or Subsystem level is sufficient to find that "full" Mechanical Completion of that Unit or Subsystem had occurred.

1755. The Tribunal has also established that, once Mechanical Completion was achieved for each subsystem, care, custody and control of that Subsystem would pass on to Reficar, as confirmed by para. 3.2.1 of Section III, Appendix I, Schedule 3 of the EPC Agreement[1798]:

> "3.2.1 During Construction activities on the project CONTRACTOR is responsible for the care, custody, and control of the project materials and equipment. When the Project has reached Mechanical Completion these responsibilities are transferred to [Reficar] […]".

1756. As soon as CB&I achieved Mechanical Completion on the Project, *i.e.*, as of February 23, 2015, Reficar took over the last Unit on the Project and CB&I was no longer under the obligation to complete any pending Works, and likewise it would not be entitled to the full Contractor's Fixed Fee as its scope of work was reduced in favour of other contractors performing the completion works.

1757. Reficar was thus in the position to select who would finalize the Works after a Unit or Subsystem was mechanically complete: this could have been CB&I, but if Reficar preferred its PCS contractors, it was free to do so, since after Mechanical Completion was achieved, it had care, custody and control over all subsystems on the Project.

2.2. THAT DELIVERY OF WORKS FREE OF DEFECTS

1758. The second limb of Reficar's Work Completion Costs claim concerns the costs incurred by Reficar in curing defects in CB&I's EPC Works, also performed by Reficar's PCS contractors.

1759. On this issue, the Tribunal will side with Claimant.

1760. The Tribunal will first analyse the relevant Contract provisions (**A.**) and later the underlying facts (**B.**).

A. Contract provisions

1761. The EPC Contract contains an array of provisions obligating CB&I to deliver the Refinery free of defects.

1762. In general, under TC 48.5, CB&I was to provide the Works "in accordance with Good Engineering and Construction Practices" (which implies a lack of defects)[1799]:

[1798] JX-006, p. 576.
[1799] JX-002, p. 222; JX-004, p. 198.

> "The Work will be executed in accordance with Good Engineering and Construction Practices in accordance with this Agreement, including all drawings, and specifications, or subsequent modifications thereof, set forth in the Agreement Documents".

1763. This obligation is reiterated under TC 71.1, which states that all Works[1800]

> "[…] shall be performed or constructed in a good workmanlike manner, shall comply with this Agreement and shall be provided in accordance with Good Engineering and Construction Practices".

1764. Accordingly, a defect, pursuant to its contractual definition, is either:

- A failure of the Work to comply with the EPC Contract (including the Project Specifications); or
- A damage in or to the Work which is a result of a failure to use Good Engineering and Construction Practices

1765. TC 49.1 then provides for CB&I's obligation to correct, replace or repair defects[1801]:

> "49.1 Subject to TC8.1.1 and TC71, if any Work is determined by the Owner to be Defective or otherwise not in conformance with this Agreement, the Owner shall issue a Written Notice to the Contractor. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be satisfactorily replaced with repaired or proper new materials in accordance with TC71 and the Contractor shall promptly segregate and remove rejected material from the Jobsite […]" [Emphasis added].

1766. This obligation is repeated in the definition of "Make Good Obligations"[1802]

> "[…] an obligation on the Contractor to repair, replace or make good a Defect, and includes the cost of any removal or reinstallation, the cost of any equipment or materials procured as part of such repair, replacement or making good, and the cost of services provided by the Contractor, Lower Tier Subcontractors and Third Parties".

1767. Services on the other hand were only qualified as deficient if they[1803]

> "[…] failed to meet the standard of performance (including appropriate levels of skill and care) normally exercised by properly qualified and competent EPC contractors performing services of a similar nature".

1768. TC 71.10.5 unifies the Make Good Obligation and the definition of Defect, stating that the obligation only arises with respect of Defects which do not meet the Project specifications and Good Engineering and Construction Practices.

[1800] JX-002, p. 255; JX-004, p. 232.
[1801] JX-002, pp. 221-222; JX-004, p. 198.
[1802] TC 1 "Definitions", JX-002, p. 167; JX-004, p. 153.
[1803] TC 71.10.03, JX-002, p. 257; JX-004, p. 234.

1769. CB&I interprets that this provision could only be triggered if the specifications were not met *and* there was a failure to meet Good Engineering and Construction Practices[1804]. The Tribunal, however, finds that TC 71.10.5 should read "and/or": the Defect can arise either because the works fail to comply with the Contract or because Good Engineering and Construction Practices have been breached. It would make little sense for a Defect to escape the duty to repair, simply because it was not caused by a double breach of Project Specification and Good Engineering and Construction Practices.

1770. As regards who corrects the defects, the Contract specifically stipulates that only CB&I can[1805]:

> "71.18 The Owner acknowledges that, in relation to deficient services, its sole remedy is the obligation on the Contractor in this TC71 to reperform the services and make good any Defects".

1771. The Tribunal notes that, although the EPC Contract seems to differentiate between deficient services and defects (of work), the duty to correct under TC 71.18 applies to both.

1772. In any event, the defects discovered by Reficar mainly correspond to damages in equipment, failure to adhere to agreed specifications and to missing items – the Tribunal is persuaded that these shortcomings *prima facie* are a breach of the Project Specifications as well as of the Good Engineering and Construction Practices.

Notice obligations

1773. TC 49.1 puts an obligation on the Owner to issue a Written Notice to the Contractor on the Defect [1806]:

> "49.1 Subject to TC8.1.1 and TC71, if any Work is determined by the Owner to be Defective or otherwise not in conformance with this Agreement, the Owner shall issue a Written Notice to the Contractor. […]".

1774. Pursuant to TC 71.3, this Written Notice had to "stat[e] with reasonable specificity the nature of the Defect together with all available evidence"[1807].

Cost of repair

1775. The burden of repairing defects was counter-balanced by the provisions in the Contract on who would bear the costs of corrective works, which in turn gave CB&I highly beneficial conditions.

1776. For deficient services, under TC 71.10.1 and 71.10.2:

[1804] ESOD, para. 1096.
[1805] TC 71.18; JX-002, p. 258; JX-004, p. 235.
[1806] JX-002, pp. 221-222; JX-004, p. 198.
[1807] JX-002, p. 256; JX-004, p. 233.

- Those with a value below USD 50,000 would be covered by Reficar under the cost-reimbursable structure (but without any profit for CB&I), and

- Those with a value over USD 50,000 would be paid by CB&I from its own pockets.

1777. For defects covered by the Make Good Obligation, under TC 71.10.4[1808]:

- Those with a value below USD 50,000 would be covered in full by Reficar, and

- Those with a value over USD 50,000 would be covered both by Reficar and CB&I, at a 50/50 ratio.

1778. Thus, even for defects which arose due to CB&I's negligence (but not gross negligence)[1809], Reficar would cover their entire correction costs if their value was below the threshold of USD 50,000 and cover 50% of the costs if their value exceeded that threshold. This would apply as long as CB&I stuck to its end of the bargain, which meant promptly correcting the defects after receiving a Written Notice from Reficar.

Limitations to the duty to repair

1779. CB&I's obligation to correct defects is not an absolute one:

1780. First, the EPC Contract establishes a period of time, during which defects had to be detected.

1781. For defects discovered prior to Mechanical Completion, CB&I is responsible for their correction, pursuant to TC 71.2[1810]:

> "If, at any time prior to Mechanical Completion, it appears that a problem in the work performed or provided by the Contractor or any other Contractor Group member could delay Mechanical Completion, the Contractor shall, upon instruction from the Owner, immediately remedy or fix the problem regardless of the cause. Further to any remedial action performed to fix the problem, the Contractor will perform an investigation to determine the actual origin of the problem and the Party or Parties who may be liable for the cost of the remedial action".

1782. If defects were discovered afterwards, CB&I was only liable for correction during the so called Defects Correction Period, according to TC 71.4[1811]:

> "Subject to TC71.5 and TC71.6, if requested by the Owner, the Contractor shall promptly repair, replace or otherwise make good any Defect which may

[1808] TC 71.10.4 (i) and (ii), JX-002, p. 257; JX-004, p. 234.
[1809] A specific exception for defects caused by gross negligence or willful misconduct is found under TC 71.19; for those, CB&I would have to cover the entirety of the costs.
[1810] JX-002, pp. 255-256; JX-004, p. 233.
[1811] JX-002, p. 256; JX-004, p. 233.

appear or occur during the Defects Correction Period at such times as the Owner reasonably requires".

1783. The Defects Correction Period is defined as ending on the earlier of:

- 18 months after Mechanical Completion of all of the Units and rectification of all items on the Punchlist;
- 12 months after the commissioning[1812] of any portion of Work; and
- 18 months after Reficar's issuance of a Written Notice to take care and custody of a mechanically complete portion or system of Work under TC 35.2.

1784. The final relevant provisions under the EPC Contract concern dispute resolution, which is the same for any scenario in which there was a dispute, including about corrective works. Section 3[1813] of the DRA provides for an initial Informal Dispute Resolution, which, if unsuccessful, allowed the Parties to escalate the dispute to ICC arbitration under Section 4[1814].

1785. The initiation of a dispute would not, however, impede the Parties' near-absolute obligations under the EPC Contract: in theory, both Parties were only able to initiate the dispute after CB&I had complied with its duty to perform corrective works.

1786. The Tribunal is not aware of either Party initiating Informal Dispute Resolution under the DRA regarding CB&I's duties to perform corrective works.

1787. Second, TC 71.6 provided for a list of exceptions for which CB&I cannot be held responsible, if it is able to "establish [that the defects] arise out of":[1815]

- improper operation or maintenance by Reficar,
- operation outside the specifications in the Contract,
- normal wear and tear, or

[1812] The Contract uses the term "First Feed", which in accordance with TC 1 "Definitions", means "the date on which process fluids or power is first introduced to the relevant portion or system of Work following its commissioning to enable the normal operation of such Work", see JX-002, p. 165; JX-004, p. 151.
[1813] JX-007, pp. 7-8.
[1814] JX-007, pp. 8-13.
[1815] JX-002, p. 256; JX-004, p. 233.
"71.6 The Contractor shall not be responsible for the repair, replacement or making good of any Defect or of any damage to the Refinery which the Contractor establishes arises out of or results from any of the following causes:
71.6.1 improper operation or maintenance of the Refinery by the Owner, except where such operation or maintenance was in accordance with any operations and maintenance manual supplied by or on behalf of the Contractor;
71.6.2 operation of the Refinery outside the specifications provided in this Agreement, except where such operation was in accordance with any operations and maintenance manual supplied by or on behalf of the Contractor;
71.6.3 normal wear and tear; and
71.6.4 Rely Upon Information […]".

- Rely Upon Information (information provided by Reficar that CB&I could legitimately "rely upon")[1816].

1788. These four exceptions describe situations for which Reficar is responsible, or which arise from normal wear and tear, for which CB&I cannot be blamed.

1789. The Tribunal finds that the term "establish" in TC 71.6 was used by the Parties to ensure that CB&I provide certain allegation and evidence, proving that the defects fell into one of the four categories of exceptions.

* * *

1790. In sum, if after Mechanical Completion Reficar discovered failures to meet the Project Specifications or Good Engineering and/or Construction Practices, Reficar had to issue a reasonably detailed Written Notice to CB&I requesting corrective works.

1791. CB&I was under the obligation to "promptly repair, replace or otherwise make good any Defect which may appear or occur", as long as the defect appeared or occurred during the Defects Correction Period and the defect did not arise out of any of the four areas outside CB&I's scope of responsibility.

1792. These corrections would, in turn, be covered under financial terms beneficial to CB&I.

B. Analysis of underlying facts

1793. Having established the Parties' obligations with respect to the correction of defective works, the Tribunal will now analyse whether the Parties (**a.** and **b.**) adhered to their respective duties under the Contract. And then it will look at the take-over by the PCS contractors (**c.**).

a. Did Reficar comply with the Contract requirements?

1794. Under TC 71.3 whenever Reficar identified that CB&I needed to perform corrective works, it was required to issue a Written Notice "stating with reasonable specificity the nature of the Defect together with all available evidence"[1817].

1795. When specifying the nature of the Defect, pursuant to TC 71.10.5[1818], Reficar would need to show that the Defects did not meet the Project specifications and/or Good Engineering and Construction Practices.

1796. Reficar has provided ample proof of having notified CB&I of the defects:

[1816] The term "Rely Upon Information" is defined under TC 1 of the EPC Contract to mean:
"design criteria, process design basis and data, Third Party licensor process design packages, the basic engineering design undertaken under the Basic FEED Contract, site details including subsurface conditions, soils reports, Existing Refinery data and historical meteorological data provided to the Contractor by the Owner, which the Contractor may deem to be correct"; see JX-002, p. 170; JX-004, p. 155.
[1817] JX-002, p. 256; JX-004, p. 233.
[1818] "71.10.5 These Make Good Obligations apply in respect of Defects which do not meet the Project specifications and Good Engineering and Construction Practices", JX-002, p. 257; JX-004, p. 234.

1797. First, on June 10, 2015, Reficar's Mr. Suárez sent a letter to CB&I's Mr. Deidehban containing lists of clearly identified defects for CB&I to remedy which span dozens of pages, listing the Unit number, detailed tag and type of issue, e.g., "damage in the area of the seal" or "metallurgy deviating from plan"[1819]:

UNI	TAG	DESVIACIÓN (RESUMIDA)
100	100-CDU-D-003	Daño en el área de sello
100	100-CDU-D-005	Boquilla no relacionada en los planos
100	100-CDU-D-005	Metalurgía diferente al plano
100	100-CDU-D-006	Metalurgía diferente al plano
100	100-CDU-D-006	Daño en fireproofing
100	100-CDU-D-007	Daño en fireproofing
100	100-CDU-D-008	Las silletas del tambor se encontraron descentradas
100	100-CDU-D-008	Metalurgía diferente al plano
100	100-CDU-D-008	Daño en el área de sello
100	100-CDU-D-008	Falta de Apriete
100	100-CDU-D-009	Metalurgía diferente al plano
100	100-CDU-D-009	Material diferente al especificado en los empaques
100	100-CDU-D-009	Pendiente instalación puesta a tierra
100	100-CDU-D-012	Material diferente al especificado en los empaques
100	100-CDU-D-014	Pendiente instalación puesta a tierra

and a list of pending items arising from an inspection of the Works, dating back to April 2015[1820].

1798. The attachment to the letter also contained a detailed enumeration of construction deviations by Unit, with a reference to the communication notifying CB&I thereof, as well as separate lists for "I&C", "*Rotativo*", and "*Eléctrico*"[1821].

1799. Second, Mr. Suárez sent another letter to Mr. Deidehban on April 30, 2015, this time specifically titled "Written Notice of Defect" informing CB&I of the defects

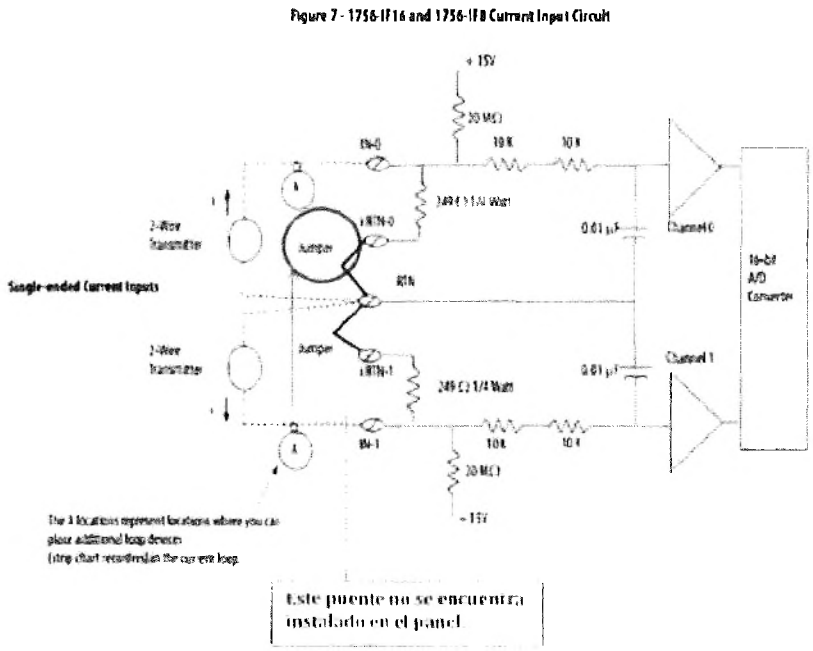
[1819] Ex. C-1150, starting at pdf p. 2.
[1820] Ex. C-1150, p. 113.
[1821] Ex. R-1849_15029_A, tab names.

in the cabling of transmitters, explicitly requesting that CB&I expeditiously undertake corrective works[1822].

1800. Third, on the same date, Mr. Suárez sent yet another letter to Mr. Deidehban, requesting that CB&I expeditiously resolve the construction deviations listed in an attachment; this attachment is not included in the record, but the Tribunal is convinced that the original attached these details as the contents of this attachment are addressed by CB&I in its response[1823].

1801. Fourth, on May 12, 2015, Reficar sent another Written Notice of Defects, this document contains an attachment of 38 pages with pictures detailing all defects identified by Reficar and its PCS contractor[1824]. Reficar requested that CB&I solve a list of deviations "as expeditiously as possible"[1825]. This letter attached not only a list of findings of construction deviations, but also detailed diagrams with explanations[1826]:

3. Al revisar la documentación del fabricante, el diagrama de conexionado de los módulos 1756-IF16 de Rockwell indica que el conexionado debe estar de la siguiente manera, pero el puente indicado en la siguiente grafica no se encontró:



as well as pictures identifying the deviations accompanied by recommended solutions[1827]:

[1822] Ex. C-0363.
[1823] Ex. C-0360; the response from CB&I in Ex. R-1849_09971 addresses the substance of the alleged Defects and so the attachment to Ex. C-0360 must have been present in the original.
[1824] Ex. R-1849_14557.
[1825] Ex. C-1149, p.1, in original "Notificación Escrita de Defecto - Desvíos de Construcción".
[1826] Ex. C-1149, pdf p. 7; the document contains other similar diagrams for other construction deviations.
[1827] Ex. C-1149, pdf p. 20.

HALLAZGOS

Durante el Precomisionamiento del transformador 141-XFR-01, 480 / 208-120 V, se identifica que por el lado de baja tensión (208 – 120 V) NO existe cableado desde el punto neutro del X0 (Neutro) del transformador hasta el tablero de distribución 141 LP-001.
El punto neutro no está conectado físicamente a tierra.

RECOMENDACIONES

- Cablear desde el punto neutro X0 hasta el tablero de distribución.
- Aterrizar el neutro físicamente con cable a la barra o punto de tierra.

1802. Reficar additionally sent further Written Notices of defects, *e.g.*, on December 24, 2015[1828].

1803. On the basis of the evidence analysed *supra*, the Tribunal is convinced that Reficar complied with its obligations under TC 71.3 and provided CB&I with Written Notices of defects which stated with reasonable specificity the nature of the defects, together with underlying evidence[1829].

b. <u>Did CB&I comply with the Contract requirements?</u>

1804. The mirror obligation for CB&I, after receiving a reasonably specific Written Notice from Reficar, was to "promptly repair, replace or otherwise make good any Defect which may appear or occur"[1830].

1805. This obligation was not without limits, as the Tribunal has established earlier: Defects had to be discovered within the Defects Correction Period (i.) and there were certain exceptions to CB&I's duty to repair (ii.).

1806. (i.) The Tribunal confirms that in its responsive e-mails in which CB&I refused to perform the corrective works, CB&I never averred that the Defects Correction Period had expired.

[1828] Ex. R-1849_15030 and a follow up message of March 18, 2016 under Ex. C-0361.
[1829] The Tribunal is not in the position to fully establish whether Reficar submitted "all available evidence" as required by TC 71.3 but finds that the evidence it did provide was sufficient for the purpose of effectuating a Written Notice under said provision.
[1830] TC 71.4, JX-002, p. 256; JX-004, p. 233.

1807. (ii.) CB&I generally avers that it was under no obligation to correct any defective works as, after a "preliminary review of the alleged deficiencies", CB&I considers that they fall under the list of exceptions. The Tribunal has already found that such a general statement is insufficient: CB&I's cursory responses did not address in detail any of the numerous defects invoked by Reficar and thus failed to "establish" that any of the exceptions under TC 71.6 applied; hence, CB&I was obligated to perform the corrective works.

CB&I's counterarguments

1808. CB&I brings three arguments purporting to prove that it was not obligated to perform any corrective works, all of which will be dismissed.

1809. (i) CB&I argues that, since the defects arose after custody, care and control of the affected Units had already been transferred to Reficar, CB&I should not be held responsible for their correction.

1810. The Tribunal does not concur.

1811. Any such transfer did not relieve CB&I from its obligation to correct defects, as defects were discovered during the Defects Correction Period, pursuant to TC 71.4. And the Tribunal finds that this stipulation is reasonable: latent defects of any machinery will only become apparent once the Refinery is running; it is impossible for initial tests to fully discover all defects that predate the delivery of custody, care and control.

1812. (ii) CB&I further submits that it was not responsible for:

- The construction deviations that arose from the provision of faulty materials or equipment by Vendors (*pro memoria*, third-party suppliers for the Project who were not CB&I's subcontractors);

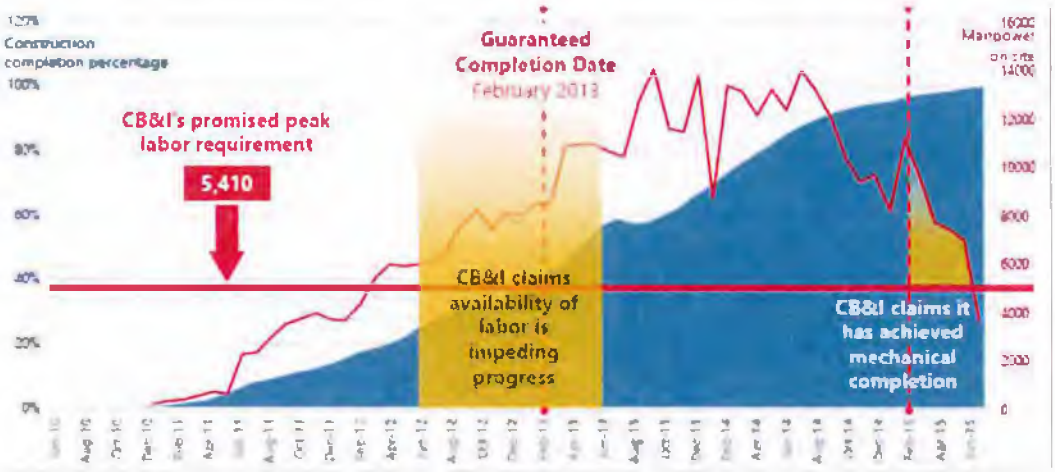
- Defects caused by accidents and/or vandalism in 2015, "at a time when CB&I had mostly demobilized its personnel"[1831]; CB&I uses the Jacobs Consultancy report from October 2015 as evidence[1832].

1813. The Tribunal has already determined that the Contract established limited exceptions to CB&I's obligation to repair – these limited exceptions are provided for in TC 71.6 and none of the two examples given by CB&I fall into them. So, even if defects were caused by Vendors or by accidents and/or vandalism, CB&I still agreed to deliver the Project free from defects and to make good any existing defects. It would, however, not assume all of the repair costs: Reficar would take up for repairs below USD 50,000 and, above that threshold, costs would be shared equally.

1814. In any event, the Tribunal has reviewed the Jacobs Consultancy report and finds CB&I's statement to be incorrect: the report only mentions that the accidents and acts of vandalism occurred in 2015, but not that CB&I had mostly demobilized by that time. In fact, CB&I still had prominent presence on the Project, even after

[1831] ESOD, para. 1108.
[1832] ESOD, para. 1108, citing to Ex. R-0014, p. 25.

Mechanical Completion was achieved in February 2015, as proven by the following diagram based on CB&I's monthly reports[1833]:



1815. (iii) CB&I finally argues that there is ample evidence by Reficar's personnel who have testified to the quality of the design and construction of the Refinery[1834].

1816. This is a *non-sequitur*: just because the final Refinery is lauded as excellent does not mean that there were no defects that Reficar's PCS contractors corrected after Mechanical Completion – in fact, CB&I has never denied that the defects existed.

c. <u>Take-over by PCS contractors</u>

1817. On the basis of the evidence marshalled, the Tribunal has found that

- Reficar complied with its Contract obligations and notified CB&I in Written Notices the need for the latter to correct defective works, and
- By refusing to repair the defects, CB&I breached its Contract obligation to promptly remedy.

1818. Reficar's response to the four letters from CB&I, refusing to repair the defects, was sent on July 23, 2015[1835]. It contains a clear statement that Reficar would assign the corrective works to other contractors, and that it reserved its right to seek recovery of the costs from CB&I[1836]:

> "As a result of CB&I's blanket refusal to correct any Defects, Reficar has been left with no choice but to take remedial action to fix Defects and fully reserves its right to seek recovery of the costs from CB&I".

1819. Reficar's behaviour was correct.

[1833] Unnumbered graph at the end of para. 326 of CPHB; Column AE from Ex. H-013.
[1834] ESOD, para. 1094, citing to testimony by Mr. Arenas, Reficar's Engineering Director, before the Procuradoria, at Ex. R-2642, p. 9 and Mr. Pittaluga, Reficar's Management, Support and Control Director, also before the Procuradoria at Ex. R-2643, p. 29.
[1835] The document itself is not dated; however, the date has been provided in the Parties' Agreed Chronological Index of Exhibits; see pdf p. 1150.
[1836] Ex. C-1153, p. 4.

1820. Under the Contract, Reficar could only request CB&I to perform corrective works[1837]:

> "71.18 The Owner acknowledges that, in relation to deficient services, its sole remedy is the obligation on the Contractor in this TC71 to reperform the services and make good any Defects" [Emphasis added].

1821. Reficar did give CB&I the opportunity to perform the corrective works, but CB&I refused to do so, in breach of its contractual obligations.

1822. In accordance with TC 8.3, in a situation such as this, in which one of the Parties fails to comply with any express remedy under the Contract, the other Party is entitled to enforce its rights under the Contract under applicable Laws[1838]:

> "8.3 Sole Remedy
>
> Where, in relation to any matter, this Agreement provides for an express remedy, such remedy shall, without prejudice to the rights of either Party to suspend or terminate this Agreement in accordance with the Terms and Conditions of this Agreement, be the sole remedy of a Party against the other. In the event that a Party fails to comply with any express remedy under this Agreement, the other Party shall, subject to TC8.1 and TC8.4, be entitled to enforce any rights it has under this Agreement under applicable Laws".

1823. Because CB&I breached the Contract by refusing to correct the defects, under Art. 1613 of the CCC, as the aggrieved party, Reficar is entitled to seek full compensation[1839]

> "*Artículo 1613. <INDEMNIZACIÓN DE PERJUICIOS>. La indemnización de perjuicios comprende el daño emergente y lucro cesante, ya provenga de no haberse cumplido la obligación, o de haberse cumplido imperfectamente, o de haberse retardado el cumplimiento".*

CB&I's counterarguments

1824. CB&I maintains that, under the EPC Contract, the only solution available to Reficar if CB&I failed to perform corrective works was to terminate the Contract in accordance with TC 49.1[1840]:

> "[…] If the Contractor fails promptly to replace rejected material or correct Defective workmanship after receiving a Written Notice from the Owner, the Owner may terminate the Agreement for default in accordance with TC65.1, after the expiry of any applicable cure period as provided in TC65.1".

[1837] TC 71.18; JX-002, p. 258; JX-004, p. 235.
[1838] TC 8.3; JX-002, p. 182; JX-004, p. 167.
[1839] CL-0018, English translation:
"Article 1613. <COMPENSATION FOR DAMAGES>. Compensation for damages includes consequential damage and loss of profit, whether derived from failure to comply with the obligation or from imperfect compliance or from delayed compliance".
[1840] JX-002, p. 221; JX-004, p. 198.

1825. CB&I's interpretation is misguided.

1826. TC 49 gave Reficar the right to terminate the Contract if CB&I failed to promptly perform corrective Works. This was an option that went beyond ordinary consequences and was likely inserted in the Contract as a special safeguard for Reficar in case CB&I's works were of insufficient quality, despite corrective works. This provision does not mean, however, that Reficar was only given this singular remedy.

1827. In addition, if Reficar had invoked TC 49.1, then the Contract would have been terminated and the defective works completed by other contractors – for which Reficar would claim damages in the arbitration; thus, the situation would be the same as the current one.

* * *

1828. In sum, CB&I was obligated under the EPC Contract to deliver

- complete Works
- free of defects.

1829. Reficar waived its right to hold CB&I accountable for the completion of works subsequent to Mechanical Completion and thus its claim has been dismissed. But, as regards the correction of defects, Reficar's claim is successful because CB&I failed to meet its contractual obligations to promptly correct defects upon receiving a reasonably specific Written Notice from Reficar.

3. CALCULATION OF DAMAGES

1830. Reficar's expert, LI, calculates the damages for CB&I's failure to correct post-Mechanical Completion defects by multiplying the number of man-hours expended by two main PCS contractors on corrective activities by their corresponding man-hour rates, and adding individual line items of a third contractor[1841]. LI's analysis then continues with a separate type of claims, for

> "additional impacts to PCS contractors due to CB&I failing to complete construction and deliver systems and units on committed dates".

1831. The question is whether the three categories of costs now claimed only relate to reparation of defects:

- In the absence of evidence to the contrary, the Tribunal accepts that the hours expended by the two main PCS contractors were spent on corrective works;
- As to the individualised line items of a third contractor, the Tribunal finds that a number of the line items, by their very names, do not correspond to corrective works; and

[1841] See LI ER, para. 1371 *et seq.* and JER 6 on Claimed Costs & Quantum, Attachment 1, tabs "Attachment 9-05 Rev. 1" and "Table 9.5-3 Rev. 1".

- The line item names prove that many of the additional impacts also do not reflect corrective works.

1832. For this reason, the Tribunal will

- accept LI's calculations on the basis of the man-hours expended by the two major PCS contractors, and

- only add the line items for the remainder of the contractors[1842] that correspond to corrective activities[1843].

1833. The calculations then are as follows:

- USD 1.36 million for the first major PCS contractor[1844] ,

- USD 5.79 million for the second one[1845], and

- USD 3.11 million[1846] for the line items for correcting works of the remaining contractors[1847].

[1842] The Tribunal notes that certain line items claimed by Reficar arise from costs it paid to its Vendors rather than contractors for corrective works; this distinction is immaterial here; if CB&I refused to correct defects, it was immaterial who ultimately corrected them; Reficar is equally entitled to the damages.
[1843] The Tribunal notes that three categories of costs concern repairs of refractories and furnaces; these will be taken into account as they are separate from the category of repair costs for the refractories and furnaces under the "Rework" category, rejected as an Excluded Cost at para. *supra*. Those costs were paid directly to CB&I and concerned repairs in Units 100, 110 and 111, see ESOC, para. 295; the refractory and furnace repair items considered Completion Costs concerned repairs in Units 115 and 116, see LI ER, para. 1399 and tables 9.5-13 and 9.5-14 of the LI ER.
[1844] Massy Energy, see LI ER, Table 9.5-10 at pdf p. 418, as updated by JER 6 on Claimed Costs & Quantum, Attachment 1, tab "Tables 9.5-10 thru 9.5-12 Rev1".
[1845] KGM Consortium ["**KGM**"], see LI ER, Table 9.5-11 at pdf p. 419; see also JER 6 on Claimed Costs & Quantum, Attachment 1, tab "Tables 9.5-10 thru 9.5-12 Rev1".
[1846] USD (k) 998+207+20+16+416+241+69+51+166+72+305+127+91+80+15+93+21+28+93=3109 k = 3.109 million or USD 3.11 million
[1847] This corresponds to:
USD 998 k for "Management of completion of construction punches in Units 002, 044, 110 & 111" by CDI S.A. [for all CDI S.A. items, see LI ER, Table 9.5-12 at pdf pp. 420-421);
USD 207 k for "Repair of leak in Cooling Water system and repair of leak in internal baffle of drum 044-D-19 in Unit 044" by CDI S.A.;
USD 20 k for "Resources invested in repair of poorly maintained instruments in Units 002, 044, 110 & 111" by CDI S.A.;
USD 16 k for "Resources invested in replacement of fireproof cable due to engineering error in Unit 044" by CDI S.A.;
USD 416 k for "Excavate for repair of underground pipeline in Unit 044" by Conequipos [for all Conequipos items, see LI ER, Table 9.5-13 at pdf p. 423];
USD 241 k for "Direct labor to replace HDPE with carbon steel pipeline in Unit 120 due to defects" by Conequipos;
USD 69 k for "Direct labor to repair underground pipeline in Unit 044" by Conequipos;
USD 51 k for "Direct labor to repair refractories in Furnaces 115/116-F-001" by Conequipos;
USD 166 k for "Direct labor to repair Exchangers 110-HCU-E-007A/B in Unit 110" by Conequipos;
USD 72 k for "Purchase of materials to repair exchangers 110-HCU-E-007A/B of Unit 110" by Conequipos;
USD 305 k for "Provide support of direct and subcontract personnel to repair underground pipeline in Unit 044" by MASA S.A.S.[for MASA S.A.S. items, see LI ER, Table 9.5-14 at pdf p. 425];

1834. The total is thus USD 10.3 million[1848].

Criticisms by CB&I's expert

1835. CB&I's expert on the quantum of Reficar's claims, Ankura, provides three major criticisms of LI's damages calculations for corrective works, all of which will be dismissed by the Tribunal.

1836. First, Ankura says that LI's calculations are flawed because they disregard the provisions of the EPC Contract, namely through:

- The inclusion of defects valued at less that USD 50,000[1849], and
- Not discounting the 50% component of costs for alleged defects that required greater than USD 50,000 to remedy[1850].

1837. The Tribunal would concur with Ankura if CB&I had complied with the Contract and carried out the defect reparation itself. In that, case, defects under USD 50,000 would have been borne by Reficar and those above the threshold, would have been split.

1838. But this is not what happened here. CB&I breached the Contract by refusing to correct the defects. And, in cases of contractual breach, Art. 1613 of the CCC entitles the aggrieved party to seek full compensation[1851].

1839. For this reason, the Tribunal need no longer look at the contractual arrangements of the distribution of costs or any underlying thresholds. Those arrangements were highly beneficial to CB&I and CB&I could have availed itself of them, had it

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USD 127 k for "Provide labor and hydroextractors to repair exchangers in Units 108 and 109 by MASA S.A.S;
USD 91 k for "Costs related to repair of Furnace 116-F-001" by MASA S.A.S.;
USD 80k for "Scaffolding used to repair refractories in Furnaces 115/116-F-001" by Tubos Vouga [for all Tubos Vouga items, see LI ER, Table 9.5-16 at pdf p. 426];
USD 15 k for "Scaffolding used to repair refractories in Furnace 116-F-001" by Tubos Vouga;
USD 93 k for "Direct man-hours spent to repair construction defects" by Daily Thermetics Instrument Corp., see LI ER, Table 9.5-16 at pdf p. 427; and
USD 21 k for "Study required due to design defects in cathodic protection system and the corrosion of underground pipelines" by INSERCOR, see LI ER, Table 9.5-19 at pdf p. 431;
USD 28 k for "Correction of construction defects" by Tapco Enpro International Inc., see LI ER, Table 9.5-23 at pdf p. 436;
USD 93 k for "Study required to design Defects in Cathodic Protection System" by TECNA I.C.E. S.A., see LI ER, Table 9.5-24 at pdf p. 437 and LI ER, para. 1430 proving that these were "design" defects discovered in July and September 2015, *i.e.*, after Mechanical Completion.

[1848] USD (million) 7.15+3.11= USD 10.26 million or USD 1.3 million when rounding.

[1849] Ankura ER, paras. 766, 780-782, 788-790.

[1850] JER 6 on Claimed Costs & Quantum, Respondent's Expert columns for: Issue 189 at pdf p. 261, Issue 196.B at pdf pp. 271-272; Issue 196.C at pdf pp. 275-276.

[1851] CL-0018, English translation:
"Article 1613. <COMPENSATION FOR DAMAGES>. Compensation for damages includes consequential damage and loss of profit, whether derived from failure to comply with the obligation or from imperfect compliance or from delayed compliance.
Cases where the law expressly limits compensation to consequential damage are excepted".

complied with its obligation to correct defective works. Since it did not, it assumed the risk of the totality of the associated cost.

1840. Second, Ankura says that LI has failed to prove that the amounts claimed actually arose from defects for which CB&I was responsible under the EPC Contract – instead, LI allegedly only performed a subjective analysis of a list of work activities by Reficar's PCS contractors[1852].

1841. The Tribunal disagrees with Ankura's criticism. The only analysis submitted to the Tribunal which quantifies the value of defects for which CB&I is responsible was prepared and submitted by LI[1853]; Ankura has not provided an alternative calculation. Upon scrutiny, the Tribunal considers LI's analysis to be plausible. The calculations performed by LI were amended as a result of the Joint Expert Report exercise, in which LI agreed with CB&I's experts that its initial calculations required some modifications. The Tribunal is not aware of any further criticisms to these updated calculations by CB&I's experts.

1842. Third, Ankura argues that the exchange rate used by LI for the two main PCS contractor man-hour rates (1 USD = COP 2,202.23) is inflated because, at the relevant time, the exchange rate was 1 USD = COP 2,751.26[1854].

1843. Ankura fails to mention that CB&I advocates for the exchange rate used by LI as the correct one when calculating other amounts, including for setting off any amounts awarded by the Tribunal[1855]:

> "In converting amounts from COP to USD, the Tribunal should apply an exchange rate of USD 1 to COP 2,202.23. The Parties used this exchange rate during the Project, including in cost reporting done by Reficar and FW. This rate, therefore, reflects the Parties' expectations and provides a reasonable and appropriate mechanism for converting amounts from COP to USD" [Citations omitted, emphasis added].

1844. It is improper for CB&I to choose a different exchange rate whenever the one used on the Project as a reasonable and appropriate mechanism is not beneficial to its position; hence, Ankura's argument is dismissed.

* * *

1845. For the reasons above, the Tribunal finds that Reficar is entitled to USD 10.3 million for CB&I's breach of its obligations to correct defective Works.

[1852] Ankura ER, paras. 769-772, 791-792.
[1853] The Tribunal notes that the Expert Report of Mr. Hillier contains in Section I, para. I8, a list of criticisms towards LI's calculations; however, the analysis does not propose any alternative calculation.
[1854] Ankura ER, para. 765, referencing paras. 758-763 and Table ACG IX-2 at pdf p. 357.
[1855] RPHB, para. 642 and fn. 1241 at pdf p. 241.

VII.2.5. PROCUREMENT COSTS

1846. Apart from the reimbursement claim for breach of the Cost Control Commitments with regard to procurement costs, Reficar brings an alternative claim for breach of CB&I's procurement obligations under the EPC Agreement[1856].

1847. To avoid awarding double- recovery, the Tribunal will not analyse Reficar's claims to the extent that they have already been addressed in the Improper EPC Costs Section. Thus, in the current Section the Tribunal will address the remaining claims for EPC Costs, which fall under the category of procurement, namely improper Vendor costs (**1.**) and Back-Charges (defined in Sub-section 2 *infra*) (**2.**).

1. IMPROPER VENDOR COSTS

1848. Reficar argues that CB&I breached its duties under the EPC Contract to properly pre-qualify and manage Vendors, which led to damages of USD 141.92 million[1857]. CB&I avers that its role in procurement was very limited and its management of Vendors appropriate, and that it cannot be held liable for Reficar's actions which caused cost overruns[1858].

1849. Reficar's procurement-related claims are similar to the reimbursement claim discussed in the Section devoted to Improper EPC Costs: in essence, Reficar claims that CB&I is responsible for any procurement-related unreasonable or improper costs incurred in breach of the Contract. Despite the similar arguments by Reficar, the Tribunal cannot apply the same methodology as it did for the reimbursement claim, because the monies for procurement did not flow through CB&I and thus the Cost Control Commitments did not apply to CB&I's procurement activities; as a result, in the Tribunal's previous decision, all procurement-related Excess Costs were excluded from Reficar's reimbursement claim (see Section VII.2.1.3.3.3.G *supra*).

1850. Reficar says that the Tribunal must analyse the alleged Vendor-related cost overruns "based on [...] CB&I's Contractual *Dolo*"[1859].

1851. The Tribunal will thus focus on whether CB&I breached its Vendor-related obligations under the EPC Contract. In doing so, it will first look at the Parties' arguments (**1.1.**) and later enter into a discussion (**1.2.**).

1.1. THE PARTIES' POSITIONS

1852. Reficar argues that under the EPC Agreement, CB&I was responsible for a multitude of procurement tasks on the Project, the most important of which was

- pre-qualifying bidders in the pre-selection phase; and then
- managing the Vendors in the post-selection phase;

[1856] See Requests for Relief under Section VI *supra*.
[1857] Communication C-175, p. 5, Table 1.
[1858] RPHB, paras. 327-338, 347-349; ESOD, paras. 515-519; 536; 544-545; 547-552.
[1859] CPHB, para. 532; requests for relief 26-29 at pdf p. 242.

CB&I's failure to properly perform these and certain other procurement-related tasks justifies its responsibility for the Vendors' cost overruns[1860].

1853. CB&I, on the other hand, argues that the EPC Contract made Reficar ultimately responsible for all procurement; CB&I only provided services that would assist Reficar[1861]. CB&I also avers that Reficar retained factual control over procurement activities (regardless of the Contract provisions), from issuing the purchase orders, through negotiating Vendor agreements, procuring equipment and material on its own paper, to giving or withdrawing final approval over all procurement decisions[1862].

1854. As regards the pre-qualification, Reficar avers that CB&I designated unqualified bidders as technically acceptable – this meant that incompetent companies were granted supply contracts and later failed to properly deliver the materials and equipment they were supposed to[1863]. CB&I, however, insists that it did its utmost efforts to only pre-qualify bidders compliant with the requirements for each procured material or equipment, but Reficar insisted on choosing local companies despite CB&I's warnings as to their unviability[1864].

1855. According to Reficar, under the EPC Contract, CB&I was responsible for a Vendor's lack of compliance with its obligations towards Reficar[1865]. In particular, CB&I failed its management obligations with regard to Vendors working in four areas:

- structural steel fabrication[1866];
- pipe spool fabrication[1867];
- electrical substations[1868]; and
- automation[1869].

1856. CB&I denies the allegation: in fact, it was Reficar who mismanaged the Vendors, for example through failing to pay in a timely manner[1870]. CB&I also gives detailed arguments for why it did not breach its obligations with regard to Vendor selection

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[1860] CPHB, paras. 257-259.
[1861] See Section VI with Reficar's request for relief.
[1862] ESOD, para. 464, first row in the table, also paras. 466, 468-477.
[1863] CPHB, para. 266-268.
[1864] ESOD, paras. 515-519; 536; 544-545; 547-552.
[1865] CPHB, para. 269, citing to TC 26.4.1 and TC 26.4.3.
[1866] CPHB, paras. 271-276. The Tribunal notes that there were various steel fabrication Vendors but Reficar's claims focus on ASER (see heading prior to para. 271 in CPHB, stating "Steel Fabrication (ASER)".
[1867] CPHB, paras. 277-285.
[1868] CPHB, para. 286.
[1869] CPHB, para. 287.
[1870] ESOD, paras. 507-512.

and management in structural steel fabrication[1871], pipe spool fabrication[1872], electrical substations[1873] and automation[1874].

1857. Reficar also argues that CB&I committed a number of other procurement-related breaches; all of these allegations will be dismissed by the Tribunal.

1.2. DISCUSSION

1858. The Tribunal will first outline the Parties' procurement-related obligations under the EPC Contract (**A.**) and then dismiss Reficar's arguments about CB&I's alleged failures in the Vendor pre-selection phase (**B.**) and the post-selection phase (**C.**).

A. Responsibility for procurement under the EPC Contract

1859. Reficar argues that CB&I was responsible under the Contract for "the vast majority of procurement-related tasks" and that CB&I was the party that led the procurement process[1875]; Reficar only retained a degree of approval and involvement typical on a cost-reimbursable contract[1876].

1860. CB&I sees things differently: the EPC Agreement is in fact an "EC" one, with Reficar being in full control of procurement[1877]. CB&I says that Reficar cannot now put the blame on CB&I for any procurement cost overruns, as Reficar made all the procurement-related decisions on the Project[1878].

1861. The Tribunal sides with CB&I.

1862. The EPC Contract is clear in delineating the respective roles of each Party: Reficar was the Party with decision-making powers and CB&I was to provide Reficar with the assistance and support it would require to enact those decisions.

1863. The above division of responsibilities arises from two areas of the Contract: the Procurement Execution Plan, which forms part of the EPC Contracts as Annex 7 (**a.**) and TC 26 "Procurement" (**b.**), with particular focus on CB&I's obligation to "manage" Vendors (**c.**).

a. Procurement Execution Plan

1864. The Procurement Execution Plan, appended to the EPC Contract as Annex 7[1879], contains detailed guidance on the responsibility of each Party for procurement-related tasks.

[1871] ESOD, paras. 515-528.
[1872] ESOD, paras. 529-535.
[1873] RPHB2, para. 36; fn. 119 at pdf p. 20.
[1874] RPHB2, para. 37; fn. 121 at pdf p. 20.
[1875] CPHB, para. 257; Reply, para. 450.
[1876] Reply, paras. 454-458.
[1877] ESOD, paras. 468-470.
[1878] RPHB, paras. 326-328.
[1879] The Procurement Execution Plan was updated during the Project, most notably in May 2012, with its Revision 9; however, these changes did not impact the main division of responsibilities under the DOR analysed *infra*; see Ex. C-1079.

1865. Section 2 of the Procurement Execution Plan titled "CB&I Entities and Responsibilities" contains a Division of Responsibility Matrix ["**DOR Matrix**"] assigning duties and responsibilities in 47 categories using the following terminology[1880]:

> L = Lead/Responsible; S = Support; I = Information; A = Approval; N/A = None

1866. Reficar argues that, pursuant to the DOR Matrix, it was the Lead/Responsible party for only four out of the 47 items, proving CB&I's responsibility for procurement on the Project overall[1881].

1867. This is only half true, because Reficar fails to mention that its input was required for all items, but three[1882]. So, while *prima facie* CB&I was responsible for the majority of procurement tasks, Reficar retained approval authority for the key stages of the procurement process such as[1883]:

- developing the primary list of bidders,
- changes to recommended suppliers/bidders lists,
- selecting preferred bidders for contract negotiations,
- negotiating final outstanding commercial considerations,
- greenlighting the final commercial and technical bid analyses authorizing contract award, and
- the signing of the Purchase Offer.

1868. CB&I says it was Reficar who bore lead responsibility or final approval authority over the crucial steps[1884], with CB&I only leading the process from an administrative standpoint[1885]. And the Tribunal agrees. In fact, Reficar itself has acknowledged that that it "maintained a degree of approval and involvement"[1886].

1869. The Tribunal's findings under the DOR matrix are confirmed by the provisions of TC 26.

b. TC 26 Procurement

1870. While the DOR matrix contains detailed procurement-related tasks for both Parties, TC 26 of the EPC Contract is key to establishing the Parties' responsibility for any procurement failures.

[1880] JX-002, p. 487; JX-004, p. 462.
[1881] JX-002, pp. 487-490; JX-004, pp. 462-465.
[1882] These were: "Coordinate contact with bidders prior to receipt of bids", "Coordinate preparation of RFQ bid addendum(s)" and "Create bid tabulation document (RFQ specific)".
[1883] Items 4, 6, 24, 25, 28 and 32; JX-002, pp. 487-490; JX-004, pp. 462-465.
[1884] ESOD, paras. 476-477.
[1885] ESOD, para. 475.
[1886] Reply, para. 454.

1871. First, TC 26 designates CB&I as the responsible party for providing all procurement services on the Project[1887]:

> "26.1 Responsibilities
>
> 26.1.1 In accordance with the Scope of Work, the Contractor is responsible for providing all procurement services (including the administration of any Purchase Offers after they have been entered into by the Owner) necessary for the Work" [Emphasis added].

1872. The wording of TC 26.1 specifically omits a statement that CB&I was responsible for all procurement activities; instead, CB&I was responsible for providing all procurement services. The Parties' intention for CB&I's limited role in Project procurement is elucidated by the example the EPC Contract provides in parentheses: CB&I's procurement services would include administering any of Reficar's contracts with the Vendors[1888].

1873. Another example of CB&I's procurement services is ensuring reasonable warranty conditions for Reficar's contracts with the Vendors, as found in TC 26.1.4:

> "26.1.4 The Contractor will ensure that each Purchase Offer will contain warranty requirements which are acceptable to the Owner (acting reasonably) for any materials, Equipment, machinery, spare parts, or supplies that are purchased from Vendors".

1874. Second, further subsections of TC 26 specify that the contracts with the Vendors must be entered into by Reficar or by CB&I, but acting in Reficar's name and on Reficar's behalf; this provision reinforces Reficar's ownership of and responsibility for Procurement[1889]:

> "26.1.3 Without prejudice to TC26.1.1 and TC26.1.2, all Purchase Offers will be entered into by the Owner or by the Contractor in the Owner's name and on its behalf [...]".
>
> [As an exception to the general rule, TC 26.1.6 of the Onshore Contract[1890] stipulates that CB&I is authorized to sign in its own name into contracts for consumables and tools for less than COP 50 million[1891] (USD 27 thousand[1892]). Neither Party is making pleadings about CB&I's responsibility for such contracts.]

1875. Third, the Contract further specifies that it will be Reficar who will deal with all financial aspects relating to procurement:

[1887] JX-002, p. 201; JX-004, p. 185.
[1888] See TC 1 Definitions: ""Purchase Offer" means any contract of any type between the Owner and the Vendor for the supply of Equipment by the Vendor"; JX-002, p. 169; JX-004, p. 155.
[1889] JX-002, p. 202; JX-004, p. 185.
[1890] The provision is "Not Used" under the Offshore Contract.
[1891] JX-002, p. 202.
[1892] This calculation is based on the exchange rate of 1 USD = 2202.23 COP that the Parties used during the Project; see RPHB, para. 642 and fn. 1241 at pdf p. 241.

- Reficar will be the party responsible for making all payments under its contracts with the Vendors, with no mention of CB&I in this regard[1893]:

> "[…] The Owner will be responsible for making all payments under the Purchase Offers referred to in TC26.1.3";

- Reficar has the right to collect on any amounts recovered through Vendor warranties; CB&I would only assist Reficar in their enforcement[1894]:

> "[…] The Owner […] will have recourse only to the relevant Vendors of such Equipment for satisfaction of any Vendor warranties. The Contractor shall assist the Owner in the enforcement of any Vendor warranties but shall not be required to institute any arbitration or litigation proceedings (although the Contractor must still provide assistance to the Owner during such proceedings)".

c. Obligation to "manage"

1876. The focal point in establishing CB&I's responsibility towards Reficar for Vendor underperformance is the interpretation of the term "manage" under TC 26.4.1: if CB&I complied with its management obligation, then it was released from responsibility for Vendors[1895]:

> "26.4.1 […]
>
> Provided that the Contractor has complied with its obligations to Manage, the Contractor shall have no responsibility for compliance by Third Party contractors, Vendors or the Freight Forwarder with the provisions of such Third Party contracts or Purchase Offers entered into by the Owner" [Emphasis added].

1877. The obligation to "manage" is elaborated upon in a further subsection of TC 26.4, in a broad and generic manner[1896]:

> "26.4.3 For the purposes of this TC26.4, "Managing" shall mean planning, directing, coordinating and actively administering the relevant Person by taking those steps in the Contractor's power which are capable of achieving the desired results under the relevant contract, which a prudent, diligent and reasonable engineering, procurement and construction company, which is properly qualified and competent in performing services of a similar nature, would take with the aim of achieving such results (short of entering into a formal dispute resolution procedure with that Person), and "Manage" and "Management" shall be construed accordingly" [Emphasis added].

1878. CB&I's obligations in managing Vendors were limited to taking any actions that any prudent, diligent and reasonable EPC company would take in order to achieve the results desired under the EPC Contract. In addition, in fulfilling these obligations, CB&I was limited to only taking those steps that were in its power;

[1893] JX-002, p. 202; JX-004, p. 185.
[1894] JX-002, p. 202; JX-004, p. 185.
[1895] JX-002, p. 204; JX-004, p. 187.
[1896] JX-002, p. 205, JX-004, p. 188.

thus, any decision by the Owner contrary to CB&I's recommendations would override any responsibility on CB&I's part.

1879. This finding is reinforced by the wording of TC 26.4.3, which obligates Reficar to cooperate with CB&I in the latter's performance of its duty to manage the Vendors[1897]:

> "The Owner shall cooperate in a timely manner with the Contractor to enable the Contractor to perform its Management obligations".

1880. The level of responsibility is thus much lower than with regard to Third Party Subcontractors, for whose performance CB&I undertook complete responsibility as a matter of an obligation of result.

* * *

1881. In sum, CB&I's duties to manage Vendors were twofold:

- on the one hand, it assisted Reficar in the pre-selection process of bidders; the winners of the tenders administered by CB&I would become Vendors, who would enter into a contractual relationship directly with Reficar;
- after the selection of the Vendors, CB&I was tasked with managing the contracts, by performing all actions within CB&I's powers which could be expected of a "prudent, diligent and reasonable" contractor.

1882. The DOR matrix and TC 26 prove that CB&I's procurement duties were, unlike for engineering and construction, limited to supporting Reficar.

B. Pre-selection duties

1883. Reficar's accusations first focus on CB&I's duties in the pre-selection phase, and more specifically, the pre-qualification of bidders for the tender.

1884. The purpose of the pre-qualification procedure was to guarantee that Vendors participating in the tender met certain technical criteria (to ensure that they can perform the work) and financial requirements (to ensure their solvency) criteria[1898].

1885. Reficar argues that CB&I failed to properly pre-qualify bidders, which led to the selection of poor Vendors, who later underperformed, leading to Reficar incurring cost overruns. According to Reficar, CB&I included on the pre-qualified bidders' lists Vendors which did not meet the strictly enumerated technical and financial criteria[1899]. Reficar has made specific claims regarding the pre-qualification of two bidders: ASER and Boccard.

[1897] JX-002, p. 205, JX-004, p. 188.
[1898] See Section 7 "Recommended Suppliers / Bidders Lists" of the Procurement Execution Plan; JX-002, pp. 498-499; JX-004, pp. 473-474.
[1899] Reply, para. 507.

1886. CB&I accuses Reficar of interfering with CB&I's bidder pre-qualification process and of having forced it to pre-qualify certain Colombian vendors, regardless of whether they fulfilled the requirements and despite CB&I's warnings[1900].

1887. The Tribunal has reviewed the available evidence and sides with CB&I.

a. ASER

1888. On June 16, 2010, CB&I notified Reficar about having shortlisted three bidders for the structural steel fabrication: a Chinese one, a UK one and ASER-Colombia[1901].

1889. According to Reficar, CB&I provided a June 2010 Bid Tab[1902], showing that ASER was technically acceptable. Reficar concedes, however, that the document contained a note stating[1903]

> "Acer [sic] only do Revenues of $6m per annum have concern over finances of that company. Verify if "Temporary Union" is legal. How will they manage +/- $20m Recommend not use unless (illegible) support".

1890. Two days later, Reficar's Mr. Beltrán wrote that only ASER-Colombia had the capability to obtain the necessary finance and expressed his disapproval for including the UK company in the shortlist[1904].

1891. The Short List Authorization document, also from June 2010, lacks a "tick" in the box titled "Technical Acceptance" for all fabricators, including ASER[1905].

1892. By the end of June, Reficar's Mr. Beltrán stated that,

> "it is clear that the ASER group have provided sufficient evidence that they can support a large portion of the structural steel fabrication requirements for the [Project]"[1906].

1893. Reficar preferred ASER over the other provider because of its lower costs, and also "to give the national industry 50% of this project"[1907], as explicitly stated in the Contract Committee meeting minutes from June 28, 2010.

1894. On July 2, 2010 Mr. Deidehban warned Reficar about ASER[1908]:

> "[i]n the case of ASER, no information that they have supplied gives us the confidence that they will be able to perform at the expected levels nor can we see that they have done anything close to what they are committing to at anytime in the past".

[1900] RPHB, para. 333, citing to Tr. 2844:24–2845:16.
[1901] Ex. R-0828, pp. 2-3.
[1902] The Tribunal has been unable to locate the exhibit.
[1903] Reply, fn. 1044 at pdf p. 257. No exhibit is referenced in the footnote despite it containing a direct citation.
[1904] Ex. R-0828, p. 1.
[1905] Ex. B-352.
[1906] Ex. R-1849_00331, p .1.
[1907] Ex. R-3766, pp. 4-5; translation at pp. 12-13.
[1908] Ex. R-0237.

1895. Mr. Deidehban observed that Reficar could override CB&I's recommendations and choose to award the contract to ASER, but emphatically stated that it would have to do so at its own risk[1909]:

> Everyone's intent in evaluation and recommendation process, in all cases, is to set the project up for success. At any time Reficar has the right to deviate from a recommendation made by CB&I. By definition it is not acceptable for Reficar to instruct CB&I to change our recommendation, however, by all means at any time Reficar can instruct CB&I to award an order in any form our shape to any supplier Reficar so chooses with the full understanding of any associated risks.

1896. On July 6, 2010 CB&I proposed two alternatives to Reficar, in which 60% of the steel fabrication would be awarded to a Chinese Vendor and the other 40% could either be granted to the reputable UK company, or to ASER[1910].

1897. The proposal to include ASER was hedged by a number of caveats, such as doubts as to ASER's capacity to undertake the contract, its lack of experience and financial condition[1911]. CB&I explicitly stated that it had not approved ASER and that it had reservations to awarding a contract to this company[1912].

1898. Despite CB&I's numerous warnings, in a response of July 9, 2010 Reficar's Mr. Bustillo explained why Reficar would ultimately award 40% of the contract to ASER and not to the experienced UK company, emphasising the opportunity for Colombian Vendors[1913]:

> Additionally, the bid evaluation shows that ASER is the technically acceptable low bid, and although the bid tab makes it clear that the potential amount of work they will get is much more than they normally do, you must also consider that the opportunity for
>
> Colombian vendors in the Colombian market has been so far limited but lack of experience alone is not a definite indication that this company would not be capable of complying with our requirements. This project represents the largest project in the country, and we are fully committed to benefit in as much as possible - within the boundaries of what is fear, feasible and reasonable - the Colombian industry and to serve as a boost to our economy generating work opportunities to develop local experience and knowledge. Furthermore, as you are also aware the expectations of the local vendors are immense.

1899. Reficar says that CB&I was negligent in pre-qualifying bidders for procuring structural steel on the Project: if it had properly vetted the bidders, ASER would never have made it to the list of pre-qualified bidders, and would not have been selected for the Project[1914].

1900. The Tribunal does not agree: there is ample evidence showing CB&I's concerns about ASER's capabilities and Reficar's insistence on choosing ASER. A decision, which CB&I warned Reficar, it would take at its own risk. Reficar cannot, now, shift on CB&I the responsibility for ASER's failure.

[1909] Ex. R-0237.
[1910] Ex. R-0238.
[1911] Ex. R-0238, p. 2.
[1912] Ex. R-0238, p. 2.
[1913] Ex. C-1055, pp. 1-2.
[1914] RPHB, paras. 273-276; Reply, paras. 514-516.

Reficar's counterarguments

1901. Reficar makes two counter-arguments:

1902. (i.) First, it argues that its hands were tied whenever CB&I included in the pre-qualified bidders' lists companies that did not meet the necessary criteria. In those instances, Reficar was obligated to choose the lowest bidder. Thus, the responsibility for any cost overruns caused by underperforming Vendors lay with CB&I.

1903. But the evidence shows that Reficar's hands were not tied and that it was perfectly capable of going against CB&I's judgment and including other Vendors of its own choosing among the pre-qualified bidders.

1904. (ii.) Reficar makes a second, equally unconvincing counterargument; namely, that it was impossible for it to adhere to CB&I's recommendations whenever CB&I advised it against awarding supply contracts to Colombian companies[1915]. Reficar's witness, Mr. Chinchilla, goes so far as to testify that "CB&I did not like national Vendors, despite the fact that it was a contractual obligation to give them the opportunity to participate"[1916].

1905. Mr. Chinchilla is referring to TC 26.1.10, prioritizing local, then regional and finally national suppliers[1917]:

> "26.1.10 As far as possible, the Contractor shall, when procuring all Lower Tier Subcontracts, Purchase Offers and contracts, give preference first to local suppliers, secondly to regional suppliers, and lastly to national (Colombian) suppliers" [Emphasis added].

1906. Mr. Chinchilla's testimony is, however, unconvincing: CB&I did not have any incentive to disregard TC 26.1.10. And, in any event, TC 26.1.10 did not stipulate that local, regional or national suppliers should be granted supply contracts, even if they did not fulfil the necessary commercial and technical criteria: this is clear from the conditional language of "as far as possible".

1907. Thus, Reficar was fully entitled to follow CB&I's warnings and not to grant supply contracts to local companies, which failed to fulfil the necessary technical and financial requirements, even if those companies were Colombian entities.

1908. Instead, the Project record shows that in some instances Reficar used TC 26.1.10 to pressure CB&I into pre-qualifying and selecting Colombian bidders, despite CB&I's warnings about the risks involved.

b. Boccard

1909. Boccard was one of the key Vendors selected for the fabrication of pipe spools, one of the most prevalent construction elements required for the Project.

[1915] ESOC, para. 508.
[1916] Chinchilla CWS, para. 64.
[1917] TC 26.1.10, JX-002, p. 203; JX-004, p. 186.

1910. There is ample evidence in the record which shows CB&I's contemporaneous warnings regarding the Vendor's adequacy and Reficar's insistence and, therefore, Reficar's risk assumption:

1911. On October 26, 2010 Reficar's Mr. Beltrán sent a letter to CB&I's Mr. McShannon, attaching a memorandum[1918] with Reficar's observations on the Bid Tab for the supply of pipe spools; under point 7, Reficar expressly acknowledges that it is aware of the risk connected with selecting Boccard, there being no assurance that its local facility would be operational in the timeline required[1919].

1912. There is also an undated excel sheet (but certainly preceding the contract award date to Boccard) titled "Pipe Fabrication Review- Cartagena Project", last modified by Reficar's Mr. Beltrán, which proves Reficar's prior knowledge of the state of Boccard's Colombian facility[1920]:

Boccard has two facilities: Houston & new facility near Cartagena, Col. Col. Facility not up and running. Have reassured that it will be by November, 2010

1913. The letter from Boccard with its best and final offer to both CB&I and Reficar[1921] reiterates Boccard's intention to use the Colombian facility[1922]:

> "our proposal enhances local content while providing the benefits of using our Houston fabrication and management capabilities" [Emphasis added].

1914. Bearing in mind Reficar's position regarding other Vendors, it is likely that Boccard was selected, precisely because it offered to handle the fabrication of at least a certain degree of the pipe spools in Colombia.

1915. For this reason, CB&I cannot be held accountable for any negative consequences of selecting Boccard, as it duly notified Reficar of the risk involved with contracting with the company, which had plans to use a local shop that was not yet operational.

C. Post-selection duties

1916. The Tribunal has already found that in accordance with the EPC Contract Reficar retained responsibility for procurement and that CB&I's role was only to provide assistance to Reficar. In addition, the Tribunal has established that Reficar ignored CB&I's warnings and directed the pre-qualification of local bidders.

1917. No matter what degree of diligence CB&I could have applied subsequent to the choice of bidders, if deficient Vendors had been selected due to Reficar's interference, CB&I cannot be held liable for the underperformance. This alone would exculpate CB&I from liability for any cost overruns due to the failures in performance of ASER and Boccard.

[1918] Ex. R-1849_0508, p. 1.
[1919] Ex. R-1849_0508, p. 3.
[1920] Ex. C-1619, cell E49.
[1921] The first listed addressee is Reficar's Mr. Beltran; the Tribunal notes that the other best final offer letters are addressed only to Mr. Beltran; see Ex. C-1617, pp. 6-10.
[1922] Ex. C-1617, p. 10.

1918. In an abundance of caution, however, the Tribunal will analyse Reficar's particular claims for CB&I's alleged mismanagement and reckless indifference to cost and schedule with regard to four Vendors, for whose underperformance Reficar presents monetary claims:

a. Steel fabrication (ASER)

1919. As regards steel fabrication, even though Reficar's claim concerns multiple steel fabricators, its arguments focus on ASER in particular.

1920. Reficar argues that CB&I should be responsible for the increase in steel quantities caused by improper estimations and late delivery of engineering drawings[1923].

1921. CB&I argues that the increases in steel quantities were a natural implication of the design changes made in the Project, mostly during the initial stages[1924].

1922. The Tribunal is convinced by CB&I's argument.

1923. CB&I has plausibly argued that in the initial stages of the Project, Reficar introduced design changes, which resulted in revisions to engineering drawings and to late delivery of engineering deliverables. The total EPC costs grew by some USD 750 million from signing of the EPC Contract (USD 3,221 million) to issuance of the Representation Forecast (USD 3,971 million), due to Synergy Changes and other scope changes ordered by Reficar; Reficar tacitly accepted this increase when it decided to continue with CB&I as the Contractor after receiving the Representation Letter.

1924. Given the number of changes ordered by Reficar at the initial stages of the Project, it is dubious that even a diligent contractor would have been able to produce all the engineering deliverables on time.

1925. To succeed in its claim, Reficar would also need to prove that CB&I failed to undertake steps, which were in CB&I's power, that a diligent and reasonable contractor would have undertaken. Reficar has not pointed the Tribunal to any such particular steps.

Mitigation actions by CB&I

1926. The finding of the Tribunal that CB&I is not responsible is reinforced by CB&I's actions vis-à-vis ASER, the main underperforming Vendor.

1927. When CB&I discovered the unsatisfactory performance of ASER, it took several mitigating steps:

- CB&I assigned its own employees to ASER's Colombia shop[1925];

[1923] CPHB, para. 272; Reply, paras. 446, 465; ESOC, paras. 286-288.
[1924] RPHB, paras. 190-192, 306; ESOD, paras. 465-466.
[1925] Ex. R-0832, p .1.

- CB&I self-performed certain of the fabrication drawings that ASER was supposed to prepare[1926];

- CB&I eventually assigned five inspectors to ASER's shops and hired an additional country supervisor[1927];

- CB&I supported Reficar, when ASER eventually sued Reficar[1928].

b. <u>Pipe spool fabrication (Boccard and Shaw)</u>

1928. Reficar argues that CB&I was responsible for cost overruns arising from the contracts with Boccard and Shaw, because CB&I was late in the delivery of the engineering[1929].

1929. The Tribunal is not convinced.

1930. The Tribunal has found that CB&I has plausibly argued that in the initial stages of the Project, Reficar instructed it to introduce design changes, which required drawings to be revised and engineering deliverables being late: this finding is true not only for steel fabrication but also for pipe spool fabrication.

1931. In addition, CB&I argues that Reficar made delayed payments to the Vendors.

1932. The minutes from a meeting between Reficar and CB&I dated July 18-22, 2011 prove that CB&I was informing Reficar of the delays in obtaining the necessary inputs from the Vendors, in particular in the area of pipe spool fabrication:

[1926] CB&I cites to its letter to Reficar Ex. R-1849_06622 in which it offers to perform a portion of ASER's work on drawings; Reficar has not argued that this has not in fact happened.
[1927] ESOD, para. 527, citing to Ex. R-0837, p. 6. Reficar has not disputed CB&I's statements about hiring the additional employee or delegating additional inspection staff to ASER or its sub-fabricator's facilities.
[1928] Mr. Baker's testimony at Tr. 3607:1-5.
[1929] ESOC, paras. 281-285.

	Piping:
13	Internal 30% Model reviews not conducted. (Disciplines working up to the last minute to incorporate late vendor and Process data, Majority of the vendor data is Preliminary, P&ID's not officially issued IFD).
14	All lines associated with this review are considered preliminary awaiting IFD Process data and 1st pass vendor information.
15	Stress / Hydraulic Reviews of critical lines not completed. (P&IDs not officially IFD, Line list data not available. Process and Mechanical data lacking.)
16	Preliminary structure modeling not completed. (Lacking good Vendor and Process line sizing data.)
17	Nozzle orientation studies not completed. (P&ID's not officially IFD, changes to vessel internals. Instrument sketches not issued)
18	Equipment modeling not completed to 1st pass vendor data.
19	A/G, U/G Tie-points and demo requirements not field verified / confirmed. (Awaiting IFD process data)
20	Preliminary in line instrument data not available.

1933. CB&I avers that Shaw's and Boccard's delays were exacerbated by the late arrival of valves from another of Reficar's Vendors, whom Reficar had failed to pay for almost two years[1930]. The Tribunal tends to give credence to CB&I's argument, which is supported by

- the minutes of a meeting between Reficar and CB&I of July 13, 2011, during which CB&I informed Reficar about the Vendor's complaints[1931]:

  "Timely payment of invoices from Reficar specifically on Valve orders. Several invoices have been with Reficar for over 60 days. Vendor is threatening to place order on hold. Reference CB&I expediting alert issue July 1st, 2011. NEED to improve process" [Emphasis added; capitals in the original]; and

- a letter from CB&I to Reficar from March 23, 2012, reiterating delays in payments to the valve Vendor[1932].

1934. Reficar brings a final accusation against CB&I, namely that the final quantities of the piping materials increased exponentially in comparison with the initial

[1930] Ex. R-1849_09547; Table 9.3 at WMC ER at pdf p. 516, citing to Ex. R-2954; WMC ER, paras. 1439-1442.
[1931] Ex. R-0787, p. 21.
[1932] Exs. Ex. R-1849_07275, with Attachments 1 through 3.

projections[1933]. In a cost-reimbursable EPC Contract the risk of any cost overruns due to quantity increases lies with Reficar (except if there is a breach of the Cost Control Commitments – which do not apply to CB&I's management of Vendors); thus, CB&I cannot be held liable for any amounts Reficar paid to the Vendors in excess of the initial estimations of their costs without the application of the Cost Control Commitments to procurement.

c. Automation (Invensys)

1935. Invensys was the supplier of Refinery process control systems[1934] responsible for automation of the Central Control Building[1935]. Reficar argues that Invensys submitted numerous Change Orders due to CB&I's late and deficient engineering[1936]. Long International, Reficar's expert, claims that Reficar paid excessive costs arising from "rework resulting from excessive data base revisions"[1937].

1936. The Tribunal is unconvinced.

1937. Reficar has failed to prove that CB&I failed to properly manage Invensys.

1938. According to Reficar, CB&I issued a total of 88 Change Orders related to the work of Invensys. Reficar does not identify the exact Change Orders, but refers to the report of its expert, Long International[1938], who in turn references the witness statement of Reficar's Mr. Arenas[1939]. Long International does not, however, analyse the findings of Mr. Arenas, or the data used by him.

1939. Be that as it may, CB&I provides an explanation for these multiple changes, which, for the reasons already explained, looks plausible: the existence of multiple design changes ordered by Reficar[1940].

d. Electrical substations (Powell)

1940. Powell Electrical Systems ["**Powell**"] was the supplier of prefabricated electrical substations for the Project[1941].

1941. Reficar claims that CB&I should be held liable for a payment made to expedite delivery of certain substations: even though Reficar paid a premium for the substations to be delivered more quickly, due to CB&I's failure to prepare the foundations, the substations could not be installed immediately and thus the premium was wasted[1942].

[1933] CPHB, para. 290; ESOC, paras. 168, 170.
[1934] WMC ER, para. 1517.
[1935] LI ER, para. 1229.
[1936] CPHB, para. 287; ESOC, para. 218.
[1937] LI ER, para. 1231.
[1938] LI ER, para. 1230.
[1939] Arenas CWS, paras. 31-47.
[1940] ESOD, paras. 370-382 and references therein.
[1941] LI ER, para. 1227.
[1942] CPHB, para. 286.

1942. Once again, the Tribunal sides with CB&I.

1943. Respondents' expert, WMC, convincingly explains that the number and parameters of the substations were changed due to Reficar-directed changes to basic engineering[1943] – this constitutes a plausible justification for CB&I's delays in preparing the foundations.

1944. In addition, Reficar's witness, Mr. Arenas, appears to agree with CB&I's reasons for the delay: "[t]he main contributing factor to this CB&I failure was late vendor data yet again"[1944]. Any risks of delayed provision of necessary data by Vendors lay with Reficar.

1945. In any event, Reficar accepted the substations-related Change Order[1945], which bars it from now claiming any of these costs as unreasonable or improper[1946].

* * *

1946. In sum, the Tribunal dismisses Reficar's claims for any of the four categories of cost overruns allegedly caused by CB&I's mismanagement of Vendors on the Project.

D. Other alleged breaches

1947. Apart from the four monetary claims, Reficar submits that CB&I committed additional breaches of its procurement obligations.

1948. First, Reficar avers that CB&I performed its procurement duties with significant delays[1947].

1949. The question of delays is discussed elsewhere by the Tribunal as part of prolongation costs (Section VII.2.1.3.3.3.H) and delay liquidated damages (Section VII.2.3); Reficar itself has presented a separate calculation for the damages caused by delays to the Project, which encompasses delays caused by any procurement-related activities.

1950. Second, Reficar argues that CB&I breached its procurement obligations because its organizational structure was deficient[1948].

1951. The argument is baseless. The changes to the organizational structure occurred before the EPC Contract[1949]. In any event, the Tribunal sees no cause-and-effect relation between Reficar's claim for Vendor cost overruns and CB&I's organizational structure for procurement.

[1943] WMC ER, paras. 950-955, 963-901.
[1944] Arenas CWS, para. 50.
[1945] Ex. C-0570.
[1946] WMC ER, para. 1521.
[1947] ESOC, paras. 665-666.
[1948] ESOC, para. 664.
[1949] See Moore CWS, para. 24, referencing the Procurement Execution Plan, Rev. 4 from April 2009, Ex. C-1081 as opposed to Rev. 5 from January 2010, Ex. C-1082. The EPC Agreement was entered into in June 2010.

1952. Third, Reficar also argues that CB&I deliberately concealed its procurement failures when it failed to submit or submitted inadequate, incorrect and incomplete reports required by the EPC Contract[1950].

1953. The Tribunal is unconvinced. Reficar has failed to point the Tribunal to any EPC Contract provisions requiring the submission of the specific reports that Reficar argues are "critical tools"[1951]. Even if, *arguendo*, CB&I had issued certain incomplete reports, this would not give rise to Reficar's recovery of the damages it seeks for Vendor underperformance.

2. BACK-CHARGES

1954. Reficar brings one more procurement-related claim, for Back-Charges, in the amount of USD 8.74 million[1952].

1955. **Back-Charges** are the labour and material costs incurred by Reficar to modify or correct Vendor materials or equipment that failed to adhere to the purchase specifications, such as incorrectly fabricated structural steel or shipping/freight damages[1953]. In addition, Back-Charges includes costs incurred for materials and equipment that were never delivered by the Vendors[1954].

2.1. THE PARTIES' POSITIONS

1956. Reficar says that out of the approximately 830 Back-Charges generated during the Project, CB&I only closed out some 300; the rest was left for Reficar to manage, and, of those, some 350 Back-Charges were rejected by the Vendors[1955].

1957. CB&I retorts by saying that the ultimate responsibility for Back-Charges remained with Reficar and, in any event, Reficar has failed to prove CB&I's responsibility for any of the sums it claims under this category[1956].

[1950] ESOC, para. 667.
[1951] ESOC, para. 667, citing to Moore CWS, para. 50 (in ESOC, the citation is wrong as it points to paras. 80-83; the witness statement ends with para. 55).
[1952] Reficar discusses the Back-Charges claim within its argumentation on improper EPC costs in materials management, see CPHB, paras. 314, 317.
At the same time, in the claims table in communication C-175, at p. 11, Reficar includes "Back-charges" as part of the "Breach" damages, but places them in a category separate from "Improper EPC Costs".
CB&I in its latest submission understands that Back-Charges form part of improper EPC costs – see RPHB, para. 541:
"Reficar includes within its purported quantification of "Improper EPC Costs" "Back Charges [...]".
In the ESOD, however, CB&I treated Back-Charges as a category separate from improper costs, see ESOD, para. 1517:
"In addition to seeking the return of the allegedly unreasonable or improper costs, Reficar also seeks, among other things, any and all damages and costs to which it claims it is entitled under applicable law, including, but not limited to its [...] (6) "vendor back-charges"".
It appears that for Reficar uses for the totality of Improper EPC Costs (communication C-175, p. 11) does not include the Back-Charges and that these costs are a separate category.
[1953] Ex. C-1311, p. 2.
[1954] CPHB, para. 314, citing to Arenas CWS, para. 15.
[1955] ESOC, para. 252.
[1956] RPHB, paras. 544-546.

1958. According to Reficar, the EPC Contract and CB&I's internal **Back-Charge Procedure**[1957] required CB&I

- to act as Reficar's representative in Back-Charge claims, and
- to maintain a Back-Charge log,

both of which CB&I failed to do[1958].

1959. Reficar has proffered the witness testimony of its Project engineer, Mr. Arenas[1959], and two Excel documents cited in his statement as proof of CB&I's failures[1960].

1960. CB&I argues that Reficar has failed to prove that CB&I did not comply with its Back-Charges-related duties[1961]. CB&I attacks the credibility of the Excel compilations presented by Reficar[1962] and draws the Tribunal's attention to the fact that none of Reficar's experts has presented an analysis of the Back-Charge claims[1963].

1961. CB&I presents the testimony of its Project Procurement Manager, Mr. Smith, who has testified that ultimately, the collection of Back-Charges was Reficar's responsibility[1964].

2.2. DISCUSSION

1962. The EPC Agreement contains two types of obligations for CB&I that affect Back-Charges: the management of Vendors (**A.**) and record-keeping (**B.**).

A. Management of Vendors

1963. TC 26.4.1 analysed in the previous Section generally obligates CB&I to "act as [Reficar's] representative in Managing [...] Vendors"[1965].

1964. The obligation to "manage" under TC 26.4.3 constitutes a generic obligation to act with the diligence of a prudent, diligent and reasonable EPC contractor performing similar services[1966].

1965. Reficar argues that CB&I breached its obligation to manage Vendors, because Reficar was required to close-out around 530 Back-Charges, and ultimately failed to recover the costs of some 300 Back-Charges. CB&I says its Back-Charge-related

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[1957] CPHB, para. 315, citing to Ex. C-1311, clause 4.9.1.
[1958] CPHB, para. 315, citing to TC 26.4.1, JX-002, p. 204; JX-004, p. 187 and TC 59.11, JX-002, pp. 240-241; JX-004, p. 217.
[1959] Mr. Arenas joined the Project as an Instrumentation and Control Engineer and became the Engineering Director in January 2014; see Arenas CWS, para. 4.
[1960] CPHB, paras. 314-316, citing to Arenas CWS, Ex. C-1059 and Ex. C-1491; Reply, para. 912 with fn.1876; ESOC, paras. 250-258; 668.
[1961] RPHB, paras. 541-546.
[1962] RPHB, paras. 542-543.
[1963] RPHB, para. 541.
[1964] RPHB, para. 545, citing to Smith RWS, paras. 73-75, 79, 81.
[1965] JX-002, p. 204; JX-004, p. 187.
[1966] JX-002, p. 205; JX-004, p. 188.

duties were limited to support activities and that it cannot be held liable for any unsuccessful Back-Charges.

1966. As an initial matter, it is dubious whether the obligation to act as Reficar's representative in managing Vendors under TC 26.4.1 includes the entirety of the Back-Charge process.

1967. TC 26.4.3 specifies that "managing" is limited to "taking [...] steps in the Contractor's power" – and CB&I argues that the final steps in the process depended on Reficar. Additionally, the obligation to "manage" explicitly excludes "entering into a formal dispute resolution procedure with [the Vendor]"[1967], meaning that CB&I's role in Back-Charges did not extend to initiating disputes.

1968. Since Back-Charges are not regulated in detail in the EPC Agreement and since Reficar had more involvement in procurement, as opposed to engineering and construction, the Tribunal tends to give credence to CB&I's argument.

Mr. Smith's explanation

1969. CB&I's witness, Mr. Smith, presents a cohesive account of the Back-Charges process based on CB&I's internal Back-Charge procedure[1968]:

- first, a defect was discovered (**a.**),
- then this defect was notified using proper forms (**b.**),
- such defect was reviewed and discussed with the Vendor (**c.**),
- and corrective action was performed either by the Vendor, an approved subcontractor or CB&I itself (**d.**),
- then, CB&I developed the formal Back-Charge claim and engaged in negotiations with the Vendor (**e.**), and
- finally, Reficar would collect the Back-Charge in the format it found optimal (**f.**).

1970. Mr. Smith avers that CB&I performed steps (**a.**) through (**d.**) on Reficar's behalf but that steps (**e.**) and (**f.**) were under Reficar's control[1969].

1971. The Tribunal is convinced by Mr. Smith's account.

1972. It was undoubtedly up to Reficar to decide on step (**f.**); only Reficar could take the decision whether certain Back-Charges would be set-off against outstanding amounts with a Vendor, or collected via a Back-Charge invoice – in fact, CB&I has presented a letter from 2012 in which Reficar gave CB&I instructions on how to collect Back-Charges in a few select cases[1970].

[1967] JX-002, p. 205, JX-004, p. 188.
[1968] Smith RWS, paras. 77-79, 81, citing to Ex. C-1311, pp. 2-5.
[1969] Smith RWS, paras. 79-81.
[1970] Ex. R-2453.

1973. That Reficar decided on how to collect the Back-Charges also tends to suggest that Reficar was involved in step (**e.**), the negotiations with the Vendors.

1974. There is an additional piece of evidence.

1975. Reficar's involvement in the process of Back-Charges has already been discussed in Section VII.2.1.3.3.3.B.h *supra*, where one of the analysed pieces of evidence was a letter from Reficar to the insurer claiming reimbursement for the damage done to the refractory equipment. This piece of evidence further proves Reficar's leading role in this area.

> [In addition, Reficar's letter concerned one of the items now listed by Reficar in the log used as key evidence for this Back-Charges claim – Reficar appears to be asking for double recovery, which the Tribunal cannot grant[1971].]

1976. Thus, even though CB&I was obligated to represent Reficar in its relations with Vendors, CB&I's obligations were limited to steps that were "in the Contractor's power". CB&I does not bear the burden of Back-Charges not collected from the Vendors.

Reficar's counterargument

1977. Reficar presents the testimony of one of its engineers, Mr. Arenas, to allege that CB&I is responsible for the roughly 350 Back-Charges rejected by Vendors for three reasons[1972]:

- Excessive delay in presenting the Back-Charge (cases of 1-3 years of delay were reported), after the warranties had expired,

- Instances when CB&I performed inspections without informing the Vendor, thus invalidating the warranties, and

- Discrepancies between the requests CB&I issued and Project specifications, which were not the fault of the Vendor.

1978. Mr. Arenas' source for the above allegations is an Excel document titled "Spreadsheet of Outstanding Backcharges"[1973]. This document was updated by Reficar when it submitted the "Updated Back-Charge Log" with its Reply[1974].

1979. For the majority of the Back-Charge rows, the conclusion in the "Background" column is that either "[n]o additional information was provided by CB&I", "[n]o documents, data or information whatsoever were found to support the Back-Charge" or "[n]o further action from CB&I"[1975].

[1971] See Ex. C-1491, rows 13, 24, 29, 47, 50, 52, 54, among others, for "KIRCHNER ITALIA S.P.A.".
[1972] Arenas CWS, para. 20.
[1973] Ex. C-1059.
[1974] Ex. C-1491.
[1975] See e.g., rows 3, 6-41.

1980. Neither the original nor the updated Excel document contains a source of the information, its date, or references to any underlying evidence, and thus, both have low probative value.

1981. Reficar has, in general, refrained from making any arguments in its submissions regarding any particular Back-Charges and instead presents the amalgamated number of all the rejected Back-Charges, attributing full responsibility to CB&I.

1982. The only individual reference is to a local arbitration award, in which the tribunal found that Reficar was not entitled to damages from a local supplier, who had provided faulty panels for the Refinery Project, because CB&I failed to timely inspect the panels' quality and later stored them in improper conditions[1976]; Reficar, however, appears to have dropped its discrete claim for losses connected with that arbitration[1977].

1983. Reficar's experts have also not provided any analysis of the Back-Charges claim[1978], further decreasing its credibility.

1984. In view of the above, the Tribunal finds that Reficar has failed to prove that CB&I breached its obligations with regard to Back-Charges and, as a result, the Back-Charges claim is rejected.

B. Record-keeping

1985. TC 59.1 requires that CB&I "maintain such records and accounts as it is required to maintain in accordance with applicable Laws"[1979]. Additionally, CB&I's Back-Charge Procedure document reiterates the obligation for CB&I to maintain "adequate detail to support the case for the back charge"[1980].

1986. Reficar points to TC 59.1 as a source of CB&I's obligation to maintain a Back-Charge log. The provision itself does not explicitly contain such a requirement; instead, it only obligates CB&I to "maintain such records and accounts as it is required to maintain in accordance with applicable Laws"[1981] – and Reficar has not brought to the Tribunal's attention any applicable law that would require such log-keeping by CB&I.

1987. Reficar also presents CB&I's Back-Charge Procedure[1982] as a source for CB&I's obligation of record keeping for Back-Charges. This document, however, is an internal CB&I policy, that cannot on its own be construed as a source for CB&I's obligations.

1988. In any event, CB&I has successfully demonstrated that it in fact "maintained a back-charge log and supporting documentation" – the Excel document from the year

[1976] ESOC, paras. 254-258, citing to CL-0286.
[1977] Under ESOC, para. 669, Reficar claimed USD 3.51 million in connection with the local arbitration. This number is no longer listed in Reficar's most recent heads of claims amounts in the CPHB.
[1978] Long International makes references to certain back-charges in its analysis on PCS-related costs, see LI ER, Section 9.5, e.g., Table 9.5-16 – but these are not corroborated by any analysis.
[1979] JX-002, p. 239; JX-004, p. 216.
[1980] Ex. C-1311, Clause 4.9.1 at p. 5.
[1981] JX-002, p. 239; JX-004, p. 216.
[1982] Ex. C-1311, Clause 4.9.1 at p. 5.

2012 it has submitted in the arbitration is sufficient proof of CB&I contemporaneously keeping Back-Charge records[1983].

1989. Mr. Smith also says Reficar was updated regularly through iDocs and in weekly status report meetings[1984], which further corroborates the finding that CB&I did keep sufficient records of the Back-Charges.

VII.2.6. INDEMNIFICATION CLAIMS

1990. Finally, Reficar brings an indemnification claim for CB&I's alleged breaches of Colombian and New York law. In particular, Reficar requests the Tribunal to issue a declaration that, in accordance with TC 14.1[1985]:

- CB&I must fully indemnify Reficar for any judgment or decision by Colombian courts or any other government entity against the Owner Group that was caused by CB&I's violation of any applicable laws; and

- CB&I is obliged to continue to indemnify and defend Reficar for and from claims pending in Colombian courts presented by workers hired by CB&I during the Project.

1991. Similarly, CB&I makes a request that the Tribunal issue a declaration that:

- CB&I does not owe Reficar any defense or indemnity under the EPC Contract or applicable law[1986];

- Reficar owes CB&I such defense and indemnity as is required by the EPC Contract or applicable law[1987];

- CB&I is entitled to reimbursement for costs and expenses incurred in responding to the Colombian government investigations of Reficar[1988]; and

- Reficar is obligated to pay all costs, expenses, fines, or penalties that CB&I incurs in responding to the Colombian government investigations of Ecopetrol, Reficar, or their employees and representatives[1989].

1992. The Tribunal will first summarize the Parties' positions (**1.**) and then enter into a discussion (**2.**).

1. THE PARTIES' POSITIONS

[1983] Ex. R-2451.
[1984] Smith RWS, paras. 74-75.
[1985] CPHB, para. 532(18 and 19).
[1986] ESOD, para. 1612(p).
[1987] ESOD, para. 1612(q).
[1988] ESOD, para. 1612(ff).
[1989] ESOD, para. 1612(gg).

1993. Reficar argues that CB&I should be held liable under TC 14.1 to the extent that its Works do not comply with the "applicable laws" under either Colombian or New York law[1990].

1994. According to Claimant, various Colombian governmental authorities, including the *Fiscalía General de la Nación* and the *Contraloría*, are investigating or have already investigated whether any performance of the Works on the Project violated applicable laws in Colombia[1991].

1995. Reficar argues that, if those authorities impose financial penalties or demands on Reficar, CB&I should indemnify Reficar in accordance with TC 14.1 of the EPC Contract[1992].

1996. CB&I considers this request to be premature[1993]: Reficar appears to rely on the hypothetical possibility of a future finding of its liability under Colombian law[1994]. According to CB&I, the Tribunal should not assess indemnity claims in abstract[1995].

1997. CB&I further avers that Reficar's indemnification claim subjects CB&I to a *probatio diabolica*; Respondents have no means of defending themselves as, thus far, Claimant has failed to[1996]:

- Present evidence of specific illegal acts;
- Connect such acts to a law that CB&I has allegedly violated;
- Demand quantified damages; or
- Establish a connection between alleged damages and CB&I's indemnity obligations.

1998. As a response, Reficar alleges that it has already incurred significant expenses due to government investigations in Colombia and CB&I is liable for those costs under TC 14.1 of the EPC Contract.

1999. Finally, CB&I also requests that the Tribunal declare that Reficar should defend and indemnify CB&I as required by the EPC Contract or the applicable law[1997].

2. DISCUSSION

2000. The Tribunal will first analyse the indemnification commitments of both Parties under the Contract (**2.1.**) and, on the basis of such analysis, conclude that both Parties' declaratory relief should be partially granted (**2.2.**).

[1990] Reply, para. 997.
[1991] ESOC, para. 826; CPHB, para. 514.
[1992] CPHB, para. 514.
[1993] ESOD, para. 1483.
[1994] ESOD, para. 1482.
[1995] ESOD, para. 1484.
[1996] RPHB, para. 664.
[1997] ESOD, para. 1612 (p. and q.).

2.1. THE INDEMNIFICATION COMMITMENTS

2001. The EPC Contract contains several provisions whereby a Party commits to indemnify the other in case certain "Claims" arise directly or indirectly from distinct breaches. The Parties have pleaded their indemnification claims under TC 15[1998] (i.) and TC 14[1999] (ii.). The Tribunal will refer to these indemnification obligations as the "**Indemnification Commitments**".

2002. (i.) Pursuant to TC 15, both Parties committed to defend, indemnify and hold the other Party's group members harmless against all Claims arising directly or indirectly in respect of certain Indemnifiable Events listed in TC 15.1.1, 15.1.2 (both in favour of the Owner Group) and TC 15.2 (in favour of the Contractor Group).

2003. Under the EPC Contract, the term "Claims" is defined as:

> "[…] all actions, suits, claims, administrative proceedings, demands, liabilities, security interests, liens, losses, damages, defects, fines, penalties, costs and expenses of any nature (including legal fees and expenses)".

2004. "Contractor Group"[2000] and "Owner Group"[2001], are defined as follows:

> "'Contractor Group' means the Contractor, its Affiliates, each Lower Tier Subcontractor, and the Associated Persons and their respective successors and assigns";
>
> "'Owner Group' means the Owner, its Affiliates and management consultants and Associated Persons (other than any member of the Contractor Group), and their respective successors and assigns".

2005. (ii.) TC 14.1 provides that the Contractor and each of the Contractor Group members commits to defend, protect, indemnify and hold the Owner Group harmless from and against any Claims[2002] due to non-compliance with applicable Laws[2003]. The Owner also assumes a substantially similar Indemnification Commitment in favour of the Contractor Group members under TC 14.2.

2006. The EPC Contract defines "Laws" as[2004]:

> "[…] the constitution, all existing laws, statutes, decrees, administrative acts, legal codes, ordinances, rules, regulations, lawful orders, permits, licenses, and other legal requirements or authorizations, as amended from time to time, of all federal, national, central, state, commonwealth, provincial, county, parish, canton, departmental, district, municipal, industrial, local and any other governmental agencies and authorities that are applicable to this

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[1998] *See*, for example, CPHB, para. 514 (footnote 926); ESOD, para. 1016.
[1999] *See*, for example, ESOC, para. 829; ESOD, para. 1481.
[2000] JX-002, p. 162; JX-004, p. 148.
[2001] JX-002, p. 168; JX-004, p. 154.
[2002] TC 14.1 and TC 14.2 extend the Indemnification Commitments to "(…) any Claims, fines, and penalties (…)". "Fines, and penalties" are already covered by the Claims definition in the EPC Contract.
[2003] JX-002, p. 186 ; JX-004, p. 172.
[2004] JX-002, p. 167 ; JX-004, p. 152.

> Agreement, the Parties, the Work or any of the Parties' obligations under this Agreement (and "lawful" and "unlawful" shall be construed accordingly) [Emphasis added]".

2007. Thus, the Parties' compliance with the obligations under the EPC Contract are also covered by the Indemnification Commitments of TC 14.

Survival of indemnity rights and obligations

2008. Finally, under TC 76, both Parties agreed that their rights and obligations[2005]

> "[…] relating to any waivers and disclaimers of liability, releases from liability, limitations of liability, indemnities, patent indemnities, confidentiality and to insurance" [Emphasis added]

would remain in full force and effect after the completion or termination of the EPC Contract[2006]

> "so as to protect each Contractor Group member and each Owner Groups member from any loss or liability that it may incur after this Agreement is assigned, completed or terminated in accordance with its terms."

2009. Summing up, the Indemnification Commitments survive the conclusion of the EPC Contract and include all commitments of one of the Parties under the EPC Contract to defend, indemnify and hold the other Party or its Group members harmless against all Claims arising out of an Indemnifiable Event.

2.2. TRIBUNAL'S DECISION

2010. Having portrayed the scope of the Indemnification Commitments, the Tribunal needs to determine if it grants the declaratory reliefs requested.

2011. Reficar requests that the Tribunal declare that CB&I should comply with its obligation to fully indemnify any Owner Group member if any payment of a "Claim", fine or penalty is imposed for CB&I's failure to adhere to the applicable laws[2007].

2012. Although CB&I objects to this request for being "premature"[2008], Respondents also request a similar declaration from the Tribunal: that Reficar should defend and indemnify CB&I as required by the EPC Contract or the applicable law[2009].

2013. Thus, the Parties' positions are closer than they seem, and the Tribunal will, in turn, partially agree with both Parties:

- Reficar's request for this declaratory relief seems reasonable: this Award has determined that CB&I has breached the Cost Control Commitments; pursuant to the definition of Laws contained in the EPC Contract, this contractual

[2005] JX-002, p. 266; JX-004, p. 242.
[2006] JX-002, p. 266; JX-004, p. 242.
[2007] ESOC, para. 829.
[2008] ESOD, para. 1483.
[2009] ESOD, para. 1612 (p. and q.).

breach is automatically also a breach of the applicable Laws: to the extent that this breach causes harm to the Owner Group through "Claims", then CB&I must comply with the Indemnification Commitments;

- At the same time, the Tribunal has also concluded that in failing to pay CB&I's invoices for reasonable and proper costs, Reficar did not fully comply with the EPC Contract, *i.e.*, the applicable Laws; hence, CB&I's plea for declaratory relief also looks reasonable.

2014. In abstract, these breaches seem to impact the Indemnification Commitments of both Parties under the EPC Contract: if a Claim covered by an Indemnifiable Event arises out of these breaches, then the breaching Party must comply with its Indemnification Commitments.

2015. Under Section VIII.2.5 *infra*, and in accordance with TC 76, the Tribunal will determine that the Indemnification Commitments under the EPC Contract survive the liquidation of the Contract.

2016. Therefore, the Tribunal sees no difficulty in declaring that the breaching Party must comply with its Indemnification Commitments, to the extent that the breaches determined in this Award give rise to an Indemnifiable Event.

CB&I's counterargument

2017. CB&I asks the Tribunal to dismiss Reficar's request for declaratory relief for being premature. CB&I has not denied that the obligation to indemnify the counterparty exists under the EPC Contract (and even requests a similar declaratory relief to the Tribunal), but states that it is too early to determine responsibility under the Indemnity Commitments.

2018. The Tribunal agrees with CB&I that it would be premature to order a precise indemnification payment and it would contravene the Parties' own request, as no Party has attempted to quantify any of their indemnification rights.

2019. However, and considering the breaches determined in this Award, it is not premature to declare that the Parties are bound by the Indemnification Commitments under the EPC Contract.

2020. In light of the above, the Tribunal declares that both Parties should continue to comply with their respective Indemnification Commitments under the EPC Contract, to the extent that the breaches determined in this Award trigger an Indemnifiable Event.

VII.3. CLAIMS OUTSIDE THE TRIBUNAL'S POWER

2021. Reficar has requested relief related to *lucro cesante*, or lost profits, and cost of capital both under its pre-contractual and contractual liability claims. Additionally, within the Work Completion claim, Reficar also requests relief for damages regarding its PCS-related costs[2010].

2022. The Tribunal has already found that CB&I's conduct in the pre-contractual stage did not amount to deceit, was incapable of resulting in *dolo incidental* and did not constitute a violation of good faith (see Section VII.1 *supra*). Similarly, the Tribunal has also adjudicated the cost-related portion of Reficar's Work Completion Claim (See Section VII.2.4 *supra*).

2023. Thus, the following section will only focus on Reficar's lost profits, cost of capital and PCS-related claims related to its contractual liability claim.

1. BACKGROUND

2024. According to Reficar, CB&I's breaches of the EPC Contract prevented the completion of the works by the Mechanical Completion date and resulted in lost profits to Reficar due to the delay of the operation of the Refinery[2011]. Therefore, Reficar requests USD 809.81 million in lost profits damages[2012].

2025. Additionally, Reficar brings two cost of capital claims, averring that:

- Had it earned the lost profits, it would have had the ability to invest these profits back into the company[2013] (i.); and

- It incurred increased financing costs because of CB&I's breach of the Cost Control Commitments[2014] (ii.).

2026. For the above claims, Reficar argues that it is entitled to (i.) USD 182.48 million; and (ii.) 325.01 million in damages[2015].

2027. Similarly, Reficar argues that CB&I's failures to meet the Mechanical Completion date resulted in[2016]:

- Delay-related PCS costs, for which it requests USD 109.88 million in damages,

- Decreased productivity of Reficar's PCS contractors, which led to damages in the amount of USD 42.59 million, and

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[2010] CPHB, para. 404.
[2011] CPHB, para. 157.
[2012] CPHB, para. 159; this includes categories of lost profits, cost on capital on lost profits, lost revenue – electricity sales and an offset for profits from extended life.
[2013] Kenrich ER, para. 5.1.
[2014] ESOC, para. 751.
[2015] CPHB, para. 85.
[2016] CPHB, para. 404.

- Additional impacts to its PCS Contractors, for which it requests USD 10.32 million[2017].

2028. CB&I objects to the Tribunal's authority to grant the abovementioned relief in the form of indirect damages, lost profits and cost of capital[2018]: according to CB&I, the DRA bars such relief or damages[2019].

2029. Reficar brings two defenses to CB&I's objection:

- First, restrictions under the DRA do not limit the Tribunal's power to award the sought damages; and

- Second, in any event, its claims for lost profits and cost of capital have the form of direct damages and are not limited by the alleged restrictions in the DRA.

2030. As determined in Section IV.3 *supra*, the Tribunal will apply New York law to adjudicate this issue. In doing so, the Tribunal will uphold Respondent's objection and conclude that it does not have the authority to grant the relief requested by Claimant under the current section.

2031. The Tribunal's findings mean that Reficar's claims for lost profits, cost of capital and PCS-related costs are outside the Tribunal's power; as a result, the Tribunal will not address them.

2. SCOPE OF THE DRA

2032. CB&I argues that Reficar cannot recover *lucro cesante* or lost profits as Section 4.13 of the DRA expressly precludes the Tribunal from awarding consequential damages to Reficar: CB&I avers that the provision unambiguously restricts the Tribunal's remedial power, precluding any award of "special, indirect, [and] consequential" damages"[2020].

2033. Furthermore, Respondents submit that TC 8.2 of the EPC Contract independently bars Reficar from recovering lost profits and consequential damages. The Parties expressly waived all claims for

> "any loss of profit [...] loss of opportunity, loss of revenue, loss of production"

and, insofar as not already covered, also

> "special, consequential, indirect, incidental [...], costs, losses, or expenses [...] arising out of or in connection with this Agreement"[2021].

[2017] The Tribunal notes that a certain number of these claims have been granted by the Tribunal in the Section on the Work Completion Claim as they in fact represented the costs incurred by Reficar on its contractors correcting the defects CB&I refused to make-good.
[2018] TofR, para. 44; RPHB, para. 214 and 225.
[2019] Communication R-165, p. 6; RPHB, para. 225.
[2020] RPHB, paras. 157, 164.
[2021] RPHB, para. 531.

Accordingly, the express exclusion agreed by the Parties precludes the recovery of any such damages[2022].

2034. On the other hand, Claimant avers that the purported limitations under Section 4.13 of the DRA and TC 8.2 of the EPC Contract are not restrictions to the Tribunal's authority; rather, they should be treated similarly to a limitation of liability clause[2023].

2035. It is Reficar's position that CB&I committed *culpa grave*/gross negligence and *dolo*/willful misconduct when it acted with systemic and reckless indifference to cost and schedule throughout the execution of the Project[2024]. In this context, Reficar avers that Section 4.13 of the DRA and TC 8.2 of the EPC Contract are exculpatory provisions under New York law[2025]; these clauses are found unenforceable when they are applied to grant immunity for acts that "smack of intentional wrongdoing"[2026]. Thus, New York law precludes CB&I from relying on them to shield itself from liability for lost profits[2027].

2036. Claimant further submits that it is irrelevant that the clauses themselves do not contain this exception, as New York courts will read in an exception to exculpatory clauses in the context of willful misconduct or gross negligence[2028].

Discussion

2037. The Tribunal sides, partially, with each Party:

2038. (i) Regarding the waiver to claim lost profits and consequential damages contained in TC 8.2.1, Claimant is correct in saying that the waiver is to be treated as a liability limitation. Liability limitations are unenforceable when the liability stems from a breach carried out with *culpa grave* or *dolo* under Colombian law or with gross negligence or willful misconduct under New York law[2029].

2039. Thus, the Tribunal agrees with Reficar that, in principle, if a breach with *culpa grave*/gross negligence or *dolo*/willful misconduct is established, Claimant would be entitled to claim lost profits, cost of capital and any other remedy available under Colombian or New York, and any contractual liability limitations would be lifted.

2040. (ii) The limitation of the Tribunal's authority, however, is a different issue. Here, the Tribunal sides with CB&I.

2041. In the DRA the Parties decided to narrow the Tribunal's authority and to exclude certain issues from its powers[2030]:

[2022] RPHB, para. 532.
[2023] Reply, para. 958; Communication C-174, p. 4.
[2024] Communication C-174, p. 4.
[2025] Reply, para. 957.
[2026] Reply, para. 957.
[2027] Communication C-174, p. 5.
[2028] Reply, para. 958.
[2029] See discussion at Section VIII.1.2.2.
[2030] Section 4.13 of the DRA; JX-007, p. 11.

> "The Arbitral Tribunal shall neither have nor exercise any power to act as *amicable compositeur* or *ex aequo et bono*, or to award special, indirect, consequential or punitive damages" [Emphasis added].

2042. Reficar now avers that the exclusion shown in the arbitration agreement should be treated as a liability limitation, subject therefore to lifting in case of *culpa grave* or *dolo* breaches.

2043. The Tribunal does not agree: there is no evidence which suggests that the exclusion of matters from the Tribunal's purview should be tantamount to an exclusion of liability. Questions of liability are a separate issue, unaffected by the arbitration agreement and the choice for a particular forum. And here the Parties validly decided that this Tribunal would lack the power to hear claims for indirect or consequential damages. This restriction of the Tribunal's powers cannot be overturned because CB&I acted with *culpa grave* or *dolo*.

2044. So, the only two questions remaining are whether:

- an exclusion of indirect or consequential damages is permissible (**A.**), and if so,
- whether Reficar's claims for loss of profit, cost of capital and PCS-related costs are "indirect or consequential damages", pursuant to Section 4.13 of the DRA (**B.**).

Since the DRA is subject to New York law, the Tribunal will take its decision pursuant to New York law.

A. Exclusion of indirect or consequential damages

2045. The exclusion of claims for indirect or consequential damages is not uncommon in New York law. According to *Mayer* and *Tabatabi*, lost profits

> "are ordinarily a form of special damages that a plaintiff must specifically plead and that parties can exclude as damages through a contractual limitation of liability provisions"[2031].

2046. Since New York law accepts that Parties voluntarily exclude those claims from the catalogue of remedies available to them, there should be no discussion that Parties can equally decide to carve out those claims from the Tribunal's authority. The Parties are, thus, free to agree on the width of the scope of the arbitration agreement.

2047. In fact, Reficar itself has acknowledged that Section 4.13 of the DRA has an impact on the Tribunal's authority: throughout its pleadings, Reficar has recognized that Section 4.13 limited "the Tribunal's authority to award punitive damages"[2032]. Because of this, Reficar agreed not to request punitive damages in this arbitration.

[2031] RL-777, Mayer, T. and Tabatabi, F. in Haig, R., "New York Practice Series – Commercial Litigation in New York State Courts", Chapter 54, Compensatory Damages, para. 54:17.
[2032] ESOC, para. 824; CPHB, para. 512.

2048. But, in accordance with the express wording of the Parties' agreement, the restrictions on the Tribunal's authority are not limited to the punitive damages; the same limitation applies to indirect or consequential damages.

B. Tribunal's remedial powers

2049. Having determined that the Tribunal has no authority to award indirect or consequential damages, the Tribunal will analyse if Reficar's lost profits, cost of capital and PCS-related claims fall within this limitation.

a. The Parties' positions

2050. CB&I submits that Reficar is claiming indirect or consequential damages by seeking an award on lost profits, cost of capital and PCS-related costs[2033].

2051. Respondents argue that New York courts have consistently concluded that lost profits are consequential damages, especially when they result from collateral business relationships, such as a separate agreement with a non-party[2034]; CB&I further avers that New York courts treat lost profits as direct damages only in rare cases, where the "non-breaching party bargained for [lost] profits and they are the direct and immediate fruits of the contract"[2035].

2052. Thus, CB&I alleges that Reficar's purported lost profits, cost of capital and PCS-related costs claims fall directly within the scope of this restriction on the Tribunal's remedial power[2036].

2053. Reficar refutes CB&I's position, by arguing that *lucro cesante* and lost profits are forms of direct damages; thus, they are not affected by the restrictions set forth under Section 4.13 of the DRA and TC 8.2 of the EPC Contract[2037].

2054. Reficar avers that, under New York law, lost profits may either be direct or consequential damages[2038]; to consider lost profits as direct damages[2039]:

- The non-breaching party must have bargained for such right: *lucro cesante* claims were clearly in the contemplation of the Parties, as shown by the extensive discussion of the internal rate of return prior to the execution of the EPC Contract[2040]; and

- They should be direct and immediate fruits of the contract: the *lucro cesante* claims are the direct return or gain that was not obtained due to CB&I's improper conduct[2041].

[2033] RPHB, para. 214 and 225.
[2034] RPHB, para. 158.
[2035] RPHB, para. 159.
[2036] Communication R-165, p. 6.
[2037] CPHB, para. 159.
[2038] Communication C-184, p. 2.
[2039] Communication C-184, p. 2.
[2040] ESOC, fn. 1774; C-0024.
[2041] Communication C-184, p. 3.

2055. Reficar argues that its cost of capital claim is for costs it incurred in financing the improper payments CB&I was never entitled to receive[2042].

2056. As regards the PCS-related costs claim, Reficar argues that, while PCS activities were not included in CB&I's scope of work, CB&I was still contractually obligated to align its work and achievement of Mechanical Completion with Reficar's PCS activities[2043].

b. Discussion

2057. Under New York law, two types of damages may generally be pled in contract cases[2044]:

- direct damages; and
- consequential damages.

2058. Direct damages are sought when the non-breaching party tries to recover the value of the very performance promised[2045]; on the other hand, consequential damages do not arise within the scope of the immediate inter-party transaction, but rather stem from losses incurred by the non-breaching party in its dealings, often with third parties[2046].

2059. As a starting point, both Parties agree that a lost profit claim under New York law will normally be treated as a claim for consequential damages. The Tribunal concurs: in *Reynolds v. Behrman Brothers* the United States District Court of New York concluded that

> "lost profits and similar damages that do not flow directly from the breach are 'special' or consequential damages"[2047].

2060. According to Reficar, this general finding under New York Law has an exception: lost profit claims will be considered direct damages under New York law if

- the non-breaching party bargained for the right to claim these damages and
- if they are direct and immediate fruits of the contract.

Reficar's position is consistent with the findings in *Biotronik A.G. v. Conor Medystems Ireland*, in which the Appellate Division of the First Department of New York Supreme Court understood that[2048]:

[2042] CPHB, para. 444, ESOC, para. 751.
[2043] CPHB, para. 403.
[2044] RL-341, p. 6.
[2045] RL-341, pp. 6-7.
[2046] RL-341, pp. 6-7.
[2047] RL-760, p. 5.
[2048] RL-701, p. 4.

> "Lost profits may be either general or consequential damages, depending on whether the non-breaching party bargained for such profits and they are the direct and immediate fruits of the contract".

C. The Tribunal's decision

2061. Thus, the Tribunal will apply these two criteria to Reficar's claims for lost profits and cost of capital thereon (**a.**), and to the PCS-related costs claim (**b.**), to determine whether these claims are within the Tribunal's power under the DRA.

a. Lost profits and cost of capital on lost profits

2062. Reficar brings three arguments to support its claim for lost profits and costs of capital on the lost profits:

2063. First, Reficar argues that the expected profits were in the contemplation of the Parties based "on the extensive discussion" of the internal rate of return prior to the execution of the EPC Contract[2049].

2064. The Tribunal is not convinced by Reficar's arguments.

2065. To buttress this assertion, Reficar points to the Execution Masterplan[2050]. The only reference to the internal rate of return is the following:

> **1.5 – Critical Issues**
>
> - Timely completion 2010 MC LS project to support Colombia environmental and Ecopetrol agreement requirements
> - Timely finish 2011 MC of the rest of the project to meet Ecopetrol agreement support.
> - Availability of local skilled craft labor
> - Timely permit submission/approval to complete project on time (new jetty, fresh water concession, environmental, etc.)
> - Project CAPEX to meet 15% of IRR. A CAPEX of 24 billion dollars was estimated (Class 5) which did not include several critical items.

2066. This reference does not show that the Parties had an extensive discussion on the expected profits of the Project; rather, it shows that, as any diligent owner would do, Reficar and Ecopetrol, prior to the Project, estimated the capital expenditure and the internal rate of return.

2067. Even assuming, *arguendo*, that this reference could serve as evidence of the Parties' discussion on the expected profits, Reficar's argument still fails: after these discussions occurred, Reficar agreed to exclude lost profits out of the sphere of the Parties' remedial rights; the EPC Contract expressly provides that neither Party was to be found liable for "loss of profit"[2051].

2068. Thus, Reficar's arguments show the opposite of what it claims: although Reficar was aware of the expected internal rate of return, it still agreed to exclude lost profit claims from the EPC Contract. In doing so, Reficar agreed to exclude from the Tribunal's powers the right of awarding lost profits.

[2049] ESOC, para. 782, fn. 1774.
[2050] Ex. C-0024, pdf p. 12.
[2051] TC. 8.2.1, JX-002, p. 181; JX-004, p. 167.

2069. Second, Reficar argues that the lost profits and cost of capital claims are direct fruits of the contracts, and it has relied on the Kenrich Group ["**KG**"] Expert Report to back up this position:

- For lost profits, it is Reficar's position that CB&I's breach prevented the completion of the Work by the Mechanical Completion Date, resulting in lost profits that Reficar could have obtained if the Refinery had been operative[2052].

- For cost of capital, the KG Report sets forth that Reficar additionally lost the potential gains it would have obtained by investing the profits back[2053].

2070. The applicable standard, to determine whether a damage derives directly from the contract, may be derived from *First Niagara Bank*[2054]: damages sought must intend to recover "the value of the very performance promised". But Reficar's claims for damages do not encompass the value of the performance that was breached, but rather represent eventual losses arising out of contracts that Reficar could have executed with third parties to maximize its revenue:

- The lost profits claim is linked to an uncertain amount of profits that Reficar could have obtained from third parties outside of the EPC Contract, had the Refinery been operational;

- The cost of capital claim on the lost profits even goes a step further: it is a speculative gain Reficar could have obtained by investing the profits previously obtained.

b. PCS-related costs claim

2071. The EPC Contract sets forth that Reficar (not CB&I) was responsible for the PCS Works, *i.e.*, the Works necessary for the pre-commissioning and start-up of the Refinery[2055]. PCS-related activities were outside of CB&I's scope of work, except for the correction of defects[2056]. The necessary consequence is that the Parties cannot have bargained for Reficar's right to claim damages from CB&I for obligations under Reficar's own and exclusive responsibility and that PCS-related cost claims must be considered to be for indirect damages.

2072. In fact, there is a contradiction in Reficar's position: it denies that PCS-related costs are indirect damages, while it accepts that a portion thereof, the PCS delay costs[2057] and other time-related PCS costs, do indeed constitute indirect damages[2058].

[2052] CPHB, para. 157.
[2053] Kenrich Group ER, para. 5.1.
[2054] RL-241.
[2055] Section III, Appendix I, Schedule I, para. 1.6 of the EPC Agreement, JX-006, p. 585: "Pre-commissioning, Commissioning, Start-Up, Reliability & Performance Testing is [Reficar's] responsibility with Contractor full assistance to the owner satisfaction".
[2056] CPHB, para. 403.
[2057] CPHB, para. 404, see for "Cost of Delays to PCS Work" category: "This amount is based on a calculation of indirect damages that occurred during the PCS phase as a result of CB&I's failure to turn over the systems and Units per the agreed schedule and sequence" [Emphasis added].
[2058] LI ER, para. 278.

2073. Reficar also claims the PCS contractors' loss of labour productivity and "additional impacts" to these contractors. These claims also give rise to indirect damages:

- Under the standard derived from *Fist Niagara Bank*[2059], damages caused by a decrease in the productivity of Reficar's PCS contractors do not encompass the value of the performance that was breached, but rather constitute indirect damages associated to contracts that Reficar had in place with third parties;

- The same is true for any "additional impacts" category: the additional impacts on the contractors also fail the test under *First Niagara Bank.*

2074. There is, however, one exception: Reficar paid certain amounts to its PCS contractors to correct defects in CB&I's Works and is now claiming reimbursement of these amounts from CB&I. This claim does not constitute indirect damages because in this case CB&I was under the Contract obligated to make-good the defective Work and refused to do so. The Tribunal has already (see Section VII.2.4 *supra*) decided this claim in Reficar's favour.

2075. Summing up, with the exception mentioned in the preceding paragraph, the Tribunal concludes that it has no power to grant damages related to PCS costs, because these damages fall within the indirect damage category.

* * *

2076. In light of the above, the Tribunal finds that Reficar's claims for lost profits, cost of capital on lost profits and indirect PCS-related costs seek relief for indirect or consequential damages, which the Tribunal has no authority to grant. Therefore, in accordance with Section 4.13 of the DRA, the Tribunal decides to dismiss these claims as it "neither ha[s] nor exercise[s] any power […] to award special, indirect, consequential or punitive damages".

[2059] RL-241.

VIII. QUANTUM

2077. The Tribunal will now analyse the quantum of damages to be awarded under the Claim and Counterclaim. Although the analysis of merits is inherently intertwined with the extent of damages (and hence, the Tribunal has reached preliminary conclusions with regard to quantum in the preceding Section), the Tribunal must still address a number of outstanding issues.

2078. The Tribunal has established the total monetary liability of CB&I towards Reficar at the amount of USD 1,008.41 million[2060], which comprises:

- USD 845.4 million due to the breach of the Cost Control Commitments[2061],
- USD 152.75 million due to the breach of the Schedule Control Commitments[2062], and
- USD 10.3 million due to the breach of CB&I's obligation to provide the Works free of defects[2063].

2079. The Tribunal has applied the Bottom-Up Total Modified Cost methodology to the breach of the Cost Control Commitments, and the use of this methodology by its very nature creates causality between the breach and the compensation, calculated as the difference between the Reasonable Cost Benchmark and the final EPC costs incurred by Reficar.

2080. For the damages awarded for CB&I's breach of the Schedule Control Commitments, causality has also been established through apportioning the days of delay for which CB&I is solely responsible.

2081. The Work Completion costs were also caused by CB&I: it breached the Contract when it declined to perform the corrective works and, as a consequence, Reficar may now claim the amounts it paid to its PCS contractors for the corrective works.

2082. According to CB&I, compensation is capped at USD 87.75 million, as a consequence of the liability cap set forth in TC 8.1.1; Reficar contests this allegation. Thus, the Tribunal must determine if the limitation of liability applies to the amounts previously calculated as damages for CB&I's breaches (**VIII.1**). Thereafter the Tribunal will address the set-off of reciprocal credits adjudicated in the present Award, the liquidation of the EPC Contract and the joint and several responsibility of the CB&I Respondents (**VIII.2**). Finally, the Tribunal will determine the applicable interest (**VIII.3**).

[2060] 845.4 + 152.75 + 10.3 = 1,008.41 (million, USD).
[2061] See para. 1354 *supra*.
[2062] See para. 1725 *supra*.
[2063] See para. 1845 *supra*.

VIII.1. LIABILITY CAP

2083. Both the Onshore and Offshore Contracts specify a Liability Cap, as well as six categories of liability which fall outside of its scope[2064]:

> "8.1.1 The total aggregate liability of the Contractor to the Owner under or in connection with this Agreement [...] not exceed seventy million Dollars (US$70,000,000.00) provided that the following liabilities (whether agreed or determined pursuant to TC46) shall not be taken into account in assessing whether the total aggregate liability (or any liability sub cap referred to in TC15.1.2, 54.8.3, 56.3.1 or 71.17) has been reached:
>
> (i) liability under any indemnity under this Agreement;
>
> (ii) liability for any insurance deductibles to be paid by the Contractor hereunder;
>
> (iii) liability arising from any fraud, Gross Negligence or Willful Misconduct committed by the Contractor;
>
> (iv) liability arising for a failure by the Contractor to comply with TC14.1 [failure to comply with local law];
>
> (v) liability for any default interest which accrues due to the late payment by the Contractor of any amount provided for under this Agreement; and
>
> (vi) any amounts paid to the Owner under the Advance Payment Letter of Credit or any repayment made to the Owner of any advance payment made by the Owner to the Contractor" [Emphasis added].
>
> [For the Onshore Contract, Spanish is the language governing its interpretation[2065]. In Spanish, (iii) reads as follows:
>
> "(iii) *responsabilidad derivada de cualquier fraude, Culpa Grave o Dolo incurridos por el Contratista*"[2066].]

2084. There is an ancillary point which the Tribunal can dispose of summarily: CB&I argues that Reficar's request to draw down on the Advance Payment LoC exceeds the Liability Cap[2067], but section (vi) above clearly states that the Advance Payment LoC is not subject to the Liability Cap.

2085. The only truly relevant category of amounts that fall outside of the scope of the Liability Cap in the current case concerns section (iii), *i.e.*, liability arising from *fraude*/fraud, *culpa grave*/gross negligence or *dolo*/willful misconduct.

[2064] TC 8.1.1, JX-002, pp. 180-181; JX-004, p. 166.
[2065] See TC 1.3; JX-002, p. 173.
[2066] JX-002, p. 51.
[2067] ESOCC, para. 384.

2086. CB&I argues that the Tribunal cannot award more than limitation of liability provisions under the EPC Contract permit[2068]. Reficar submits the contrary: the liability cap is irrelevant, because CB&I acted with *culpa grave*/gross negligence (or subsidiarily with *dolo*/willful misconduct)[2069].

2087. The Tribunal will first address the Parties' positions (**1.**) and then make a determination (**2.**).

1. THE PARTIES' POSITIONS

2088. The Parties make extensive arguments on whether the liability cap finds application to any damages awarded by the Tribunal; the key dispute concerns whether CB&I breached its Cost and Schedule Control Commitments with *culpa grave* or *dolo*.

1.1. REFICAR'S POSITION

2089. Reficar argues that the liability cap does not apply to any damages awarded by the Tribunal.

2090. First, CB&I acted with *culpa grave*[2070].

2091. Reficar says that *culpa grave* requires the showing that a party failed to perform an obligation with the level of diligence or care that even a negligent or careless person would exhibit in his or her own business[2071], which is precisely what CB&I did: it should have treated the Project as if it were a lump sum where the contractor's own finances were at risk and yet it allowed for cost overruns in the range of USD 2 billion on top of a +/-5% accuracy representation as to the Project costs[2072].

2092. Reficar also argues that CB&I was motivated by the desire to make additional profits at the expense of Reficar through rate arbitrage[2073] and through windfalls it gained from its failures in the areas of engineering, modularization, and labour relations[2074].

2093. Second, the liability cap also finds no application to any damages awarded by the Tribunal because CB&I breached its obligations with contractual *dolo*[2075].

2094. As regards the applicable standard, Reficar first makes a reference to Art. 63 of the CCC, defining *dolo* as the positive intent to cause harm – a definition specifically referenced by the EPC Contract[2076].

2095. Reficar argues, however, that Colombian courts do not interpret this provision literally and that instead, the key element of *dolo* is not "intent" but the deliberate

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[2068] RPHB, para. 491; ESOD, paras. 15, 1333-1335.
[2069] CPHB, paras. 21, 121-122, 426-433,
[2070] CPHB, paras. 195-200.
[2071] H-041, p. 117.
[2072] CPHB, paras. 13, 198, 319, Reply, para. 166.
[2073] CPHB, paras. 14-20.
[2074] CPHB, para. 154.
[2075] ESOC, paras. 786, 810.
[2076] ESOC, para. 791.

or conscious breach of a party's contractual obligations[2077]. Reficar avers that this interpretation has prevailed since a seminal decision by the Colombian Supreme Court in 1949[2078] and has also been applied by arbitral tribunals deciding on the basis of Colombian law[2079].

1.2. CB&I'S POSITION

2096. According to CB&I, the liability limitations in the Contract limit any damages to be awarded by the Tribunal to the amounts set under TC 8.1, with none of the potential exceptions listed in the Contract finding application.

2097. First, CB&I argues that *culpa grave* requires the meeting of a very high standard, which can only be found in "exceptionally rare circumstances"[2080].

2098. According to CB&I, Reficar is not bringing a case for design errors or construction defects, both of which would be indicative of *culpa grave*[2081]. An example is a case in which a contractor installed piping designed for fire-hose water instead of piping designed for drinking water, resulting in contaminated water in the building it was constructing[2082]. This is not comparable with the current arbitration, in which Reficar obtained a world-class Refinery[2083].

2099. CB&I also avers that a finding of *culpa grave* can only be made with regard to specific breaches, rather than with regard to the general contractual performance of a party[2084] and that Reficar has failed to meet its burden of proof in this regard.

2100. In any event, Reficar's claims about CB&I's alleged mismanagement of cost and schedule controls lack merit because Reficar performed extensive audits of CB&I's costs and was regularly informed of construction progress[2085].

2101. As regards any alleged illicit profit motive, CB&I did not obtain excessive additional profits from the Project; in fact, its Fixed Fee only increased by approximately USD 10.5 million[2086].

2102. Second, CB&I also argues that Reficar has failed to prove that CB&I acted with contractual *dolo*[2087].

[2077] Reply, para. 196, citing to CL-0078, pp. 17-18; CL-0090, p. 23; CL-0081, p. 329; CL0065, p. 92; ESOC, paras. 792-796, citing to CL-0065, p. 92; CL-0103, p. 253 (pdf p. 3) and Solarte ER, para. 109 and fn. 60.
[2078] ESOC, para. 791, citing to CL-0063.
[2079] ESOC, paras. 792-795.
[2080] RPHB, paras. 511-512; ESOD, para. 1456.
[2081] RPHB, para. 16.
[2082] ESOD, para. 1456, citing to RL-144, at pp. 58-60.
[2083] RPHB, paras. 1-8, 578.
[2084] RPHB, paras. 491, 509; ESOD, para. 1457.
[2085] RPHB, paras. 18-19,
[2086] ESOD, para. 19.
[2087] ESOD, para. 1336.

2103. CB&I emphasizes the literal meaning of the Art 63 of the CCC, which states that *dolo* refers to the positive intent to cause damage to another or their property[2088] – and says that Reficar has failed to prove such intent on CB&I's part.

2104. According to CB&I, the intent to cause harm must be established to make a finding of *dolo*; otherwise, the concepts of *culpa grave* and *dolo* would become indistinguishable[2089].

2. DISCUSSION

2105. Having summarised the Parties' positions, the Tribunal will now analyse the EPC Contract provisions that limit the Contractor's liability (**2.1**), and the concept of *culpa grave* under Colombian law (**2.2**); on the basis of this analysis, the Tribunal will apply its criteria for *culpa grave* under Colombian law to the facts of the case (**2.3**) and conclude that CB&I breached its cost and schedule control obligations with *culpa grave* (**2.4**). The Tribunal has previously found[2090] that Reficar's claims may be brought under either the Onshore or the Offshore Contract; since Reficar focuses its claims on the Onshore Contract, the Tribunal will analyse the limitations of liability under this Contract, which is subject to Colombian law, first and foremost. In any event, the result will the same under the law of New York (**2.5**).

2.1. CONTRACT TERMS

2106. The Tribunal will first analyse the provisions limiting the Contractor's liability[2091] under the Contract (**A.**) and then the exclusions to these limitations (**B.**).

A. Liability Cap provisions

2107. The EPC Contract provides for limitations of liability in different areas. But the only relevant ones are the following two ["**Liability Caps**"]:

- USD 70 million under TC 8.1[2092]:

> "8.1.1 The total aggregate liability of the Contractor to the Owner under or in connection with this Agreement (which includes, but is not limited to, (a) liability for Contractor default, (b) liability for Defects, (c) Delay Liquidated Damages payable under TC54.8 (other than those payable under TC54.8.1(i)), (d) Performance Liquidated Damages payable under TC56.2 and subject to the amount set forth in TC56.3.1, and I the Contractor's obligations to reperform any services or make good any deficient Work under TC71), will not exceed seventy million Dollars (US$70,000,000.00) [...]" [Emphasis added];

[2088] ESOD, para. 1398, citing to Art. 66 of CCC.
[2089] ESOD, para. 1537, citing to Arrubla Second ER, paras. 48-59.
[2090] See Section IV on the Law applicable to the dispute.
[2091] The Tribunal notes that a separate Liability Cap applies to any liability owed to the Contractor by the Owner; however, Reficar does not invoke these provisions in its defense to the Counterclaim.
[2092] JX-002, pp. 180-181; JX-004, p. 166. The Tribunal notes that a separate cap for just Delay Liquidated Damages was set at USD 45.75 million under TC 54.8.1(ii) but since this number is lower than the overall liability cap and since Reficar does not limit its claims to Delay Liquidated Damages, the Tribunal does not analyse this liability cap in detail.

- USD 15.75 million for delay of 60 days in the Mechanical Completion of the Project under TC 54.8.1(i)[2093]:

"54.8 Delay Liquidated Damages

54.8.1 Subject to TC54.8.1A, if the Contractor fails to achieve Mechanical Completion of all of the Units by the Guaranteed Completion Date, the Contractor shall be liable to pay Delay Liquidated Damages for each Day from the Day immediately following the Guaranteed Completion Date up to and including the date Mechanical Completion of all of the Units is achieved, at the following rates per Day:

(i) at the rate of two hundred and sixty two thousand five hundred Dollars (US$262,500) per Day for the first 60 (sixty) Days of such delay [...]

54.8.2 Any amount payable pursuant to TC54.8.1(i) shall not count towards the Contractor's aggregate limit on liability set out in TC8.1.1." [Emphasis added]

B. Liability Cap exclusions

2108. Both the Onshore and Offshore Contract specify six categories of liability under TC 8.1 which fall outside of the scope of the Liability Caps[2094]:

"8.1.1 The total aggregate liability of the Contractor to the Owner under or in connection with this Agreement [...] will not exceed seventy million Dollars (US$70,000,000.00) provided that the following liabilities (whether agreed or determined pursuant to TC46) shall not be taken into account in assessing whether the total aggregate liability (or any liability sub cap referred to in TC15.1.2, 54.8.3, 56.3.1 or 71.17) has been reached:

(i) liability under any indemnity under this Agreement;

(ii) liability for any insurance deductibles to be paid by the Contractor hereunder;

(iii) liability arising from any fraud, Gross Negligence or Willful Misconduct committed by the Contractor;

(iv) liability arising for a failure by the Contractor to comply with TC14.1 [failure to comply with local law];

(v) liability for any default interest which accrues due to the late payment by the Contractor of any amount provided for under this Agreement; and

(vi) any amounts paid to the Owner under the Advance Payment Letter of Credit or any repayment made to the Owner of any advance payment made by the Owner to the Contractor" [Emphasis added].

[2093] JX-002, p. 226; JX-004, p. 203.
[2094] JX-002, pp. 180-181; JX-004, p. 166.

> [For the Onshore Contract, Spanish is the language governing its interpretation[2095]. In Spanish, (iii) reads as follows:
>
> "(iii) *responsabilidad derivada de cualquier fraude, Culpa Grave o Dolo incurrido por el Contratista*"[2096]]

2109. Out of the scenarios above, the only relevant one in the current case concerns roman number (iii), *i.e.*, liability arising from *fraude*/fraud, *culpa grave*/gross negligence or *dolo*/willful misconduct.

> [The Tribunal will not analyse the concept of fraud/*fraude,* because neither Party brings any claim or counterclaim on such basis; in any event, the term appears to be similar in nature to *dolo*[2097].]

2110. The Tribunal must, then, establish whether CB&I breached its obligations with *culpa grave*/gross negligence or *dolo*/willful misconduct.

2111. In order to fully ascertain the meaning of the concepts enumerated as exceptions to the Liability Caps – *culpa grave*, gross negligence, *dolo* and willful misconduct – the Tribunal will revert to the definitions section of both the Onshore and Offshore Contract.

2112. The Onshore Contract provides that the terms "*Culpa Grave*"[2098] and "*Dolo*"[2099] have the meaning given to them under the CCC. The equivalent terms "Gross Negligence"[2100] and "Willful Misconduct"[2101], in the English version, refer to the same provisions of Colombian law.

2113. "Willful Misconduct" is described in the English version of the Offshore Contract as "an intentional act or omission that the relevant Person knew or should have known was wrongful"[2102]. The equivalent term in Spanish is defined as "*Mala Conducta Intencional*" – a literal translation of "willful misconduct". The term is followed by "(*Dolo*)" in parentheses, which means that the Offshore Agreement equates willful misconduct and *dolo*[2103]. The terms "*Culpa grave*" and "Gross Negligence" are not defined in the Offshore Contract.

2114. In accordance with the provisions of the Onshore and Offshore Agreements, Colombian law will take precedence in the Tribunal's analysis of *culpa grave*/gross negligence and *dolo*/willful misconduct: the Onshore Contract specifically references the CCC and, since the Offshore Contract does not define *culpa*

[2095] See TC 1.3; JX-002, p. 173; JX-004, p. 159.
[2096] JX-002, p. 51.
[2097] Reficar only cursorily states that CB&I's acts that amount to *dolo* would be equivalent to *fraude* but makes no separate arguments, see ESOC, paras. 789, 803-804, 809. The Tribunal notes that the concept of fraud/*fraude* was also not discussed in the Joint Expert Report on Colombian Law.
[2098] JX-002, p. 31.
[2099] JX-002, p. 32.
[2100] JX-002, p. 166.
[2101] JX-002, p. 171.
[2102] JX-004, p. 157.
[2103] JX-004, p. 34.

grave/gross negligence and equates willful misconduct with *dolo*, the Tribunal will interpret both legal concepts under Colombian law.

2115. In addition, CB&I has acknowledged that a finding under either Colombian or New York law is sufficient to disarm the Liability Caps with regard to each claim[2104]:

> "Reficar cannot recover damages in excess of USD 85.75 million, unless it can establish that each component of its claimed damages arises from fraud, gross negligence, or willful misconduct under New York law or the equivalent Colombian law principles of fraude, culpa grave, and dolo" [Emphasis added].

2116. In any event, the Tribunal's conclusions will be affirmed under New York law.

2.2. ENFORCEABILITY OF THE LIABILITY CAPS

2117. The Parties argue whether the Liability Caps provisions under the EPC Contract are binding and enforceable.

A. The Parties' positions

2118. Reficar avers that the Liability Caps find no application under Colombian law and is void because it is derisory[2105], abusive[2106], or unenforceable as it concerns an essential obligation under the Contract[2107].

2119. The result under New York is no different: the Liability Caps are also unenforceable because it is unconscionable[2108], and attempts to limit liability for intentional wrongdoing and duress[2109].

2120. CB&I argues that Reficar exercised its freedom of contract, recognized both under Colombian and New York law, when it agreed to the Liability Caps[2110]. Both legal systems limit the freedom to contract if it contravenes statutory law or public policy – neither of which is the case with the EPC Contract[2111].

2121. According to CB&I, the Liability Caps were duly negotiated by two sophisticated parties and should be enforced by the Tribunal despite the fact that Reficar now finds this provision to be disadvantageous to its position[2112].

B. Tribunal's decision

2122. Reficar argues that the Liability Caps cannot be applied under Colombian and New York law due to its derisory or abusive nature and CB&I avers that it is a perfectly enforceable provision negotiated by two sophisticated parties.

[2104] RPHB, para. 491.
[2105] ESOC, paras. 755-759.
[2106] ESOC, paras. 760-762.
[2107] ESOC, paras. 763-765.
[2108] ESOC, paras. 770-772.
[2109] ESOC, paras. 773-774.
[2110] ESOD, paras. 1487-1489.
[2111] ESOD, paras. 1491-1498.
[2112] ESOD, para. 1490.

2123. The Tribunal sides with CB&I.

2124. Both Parties agree that the CCC recognises the right of the contracting parties to modify the general rules on liability through consensual agreement by limiting or excluding certain types of liability[2113]. New York courts have also unequivocally established that the limitations of liability agreed by two sophisticated Parties are in general enforceable[2114].

2125. A liability cap, like any provision, would not be enforceable if it attempted to impose restrictions that are forbidden by statutory law or public policy. The clearest example of such an unenforceable liability limitation provision would be one for liability arising from *culpa grave*/gross negligence or *dolo*/willful misconduct[2115]. But these circumstances have been expressly included as exceptions to the Liability Caps under TC 8.1[2116]. Reficar's argument as to the alleged exclusion of liability arising from intentional wrongdoing is, thus, moot.

2126. The Tribunal is likewise unconvinced by Reficar's arguments that the character of TC 8.1. is derisory, abusive, unconscionable or coercive.

2127. The concepts invoked by Reficar are predominantly applicable in consumer contracts, where one party has a clear advantage or a higher bargaining power than the other. In the present case, Reficar is an expert in the business of running oil refineries, and as such cannot avail itself of protection invoking consumer laws; furthermore, it was advised by a professional law firm and a multitude of external advisors, equalising any imbalances in the position of knowledge.

2128. Finally, the existence of contractual limitations to the parties' liabilities is a typical mechanism in construction contracts. In fact, Reficar fails to mention that the limitation was negotiated not only for CB&I's liability towards Reficar, but also for Reficar's liability to CB&I, with the same list of exceptions to its application[2117].

2129. There is, thus, no evidence on the supposed derisory, abusive, unconscionable or coercive character of the Liability Caps provisions.

[2113] RPHB, para. 493; ESOC, para. 786.
[2114] See *e.g.*, RL-748, para. 352 at pdf p. 6: "It is well settled that courts must honor contractual provisions that limit liability or damages because those provisions represent the parties' agreement on the allocation of the risk of economic loss in certain eventualities"; RL-751, paras. 266 at pdf p. 2: "A clause which exculpates a contractee from liability to a contractor for damages resulting from delays in the performance of the latter's work is valid and enforceable and is not contrary to public policy if the clause and the contract of which it is a part satisfy the requirements for the validity of contracts generally".
[2115] For Colombian law, see Solarte ER, para. 109: "*dolo* and *culpa grave* limit the validity of clauses that restrict liability in the sense that an agreement by the parties regarding the scope of the obligation to pay damages cannot go so far as to release the debtor for intentional breaches or breaches arising from *culpa grave*"; for New York law, see *e.g.*, *Abacus Fed. Savings Bank v. ADT Sec. Srvs., Inc.*, 967 N.E.2d. 666, 669 (N.Y. 2012): "However, it is New York's public policy that a party cannot "insulate itself from damages caused by grossly negligent conduct" and *Red Sea Tankers Ltd. v. Papachristidis (The Ardent)* [1997] 2 Lloyd's Rep. 548 (11): "the fact that New York law would not recognize the validity of any exclusion of gross negligence supported that conclusion".
[2116] In the case of TC 54.8.3, the provision specifically states that the limitation of the Contractor's liability for Delay Liquidated Damages is "[s]ubject to TC8.1.1]", which includes the exceptions for *culpa grave*/gross negligence and *dolo*/willful misconduct.
[2117] TC 8.4, JX-002, p. 182; JX-004, p. 168.

2.3. *CULPA GRAVE* UNDER COLOMBIAN LAW

2130. The Tribunal will now analyse the concept of *culpa grave*, beginning with the legal definition (**A.**); the Tribunal will then determine who bears the burden of proof when allegations of *culpa grave* are made (**B.**), look at different possible criteria for establishing *culpa grave* (**C.**) and finally scrutinise relevant Colombian case law (**D.**).

A. Legal definition

2131. *Culpa*, in English negligence or fault, is regulated under Art. 63 of the CCC[2118]:

> "*Artículo 63. <CULPA Y DOLO>. La ley distingue tres especies de culpa o descuido.*
>
> *Culpa grave, negligencia grave, culpa lata, es la que consiste en no manejar los negocios ajenos con aquel cuidado que aun las personas negligentes o de poca prudencia suelen emplear en sus negocios propios. Esta culpa en materias civiles equivale al dolo.*
>
> *Culpa leve, descuido leve, descuido ligero, es la falta de aquella diligencia y cuidado que los hombres emplean ordinariamente en sus negocios propios. Culpa o descuido, sin otra calificación, significa culpa o descuido leve. Esta especie de culpa se opone a la diligencia o cuidado ordinario o mediano.*
>
> *El que debe administrar un negocio como un buen padre de familia, es responsable de esta especie de culpa.*
>
> *Culpa o descuido levísimo es la falta de aquella esmerada diligencia que un hombre juicioso emplea en la administración de sus negocios importantes. Esta especie de culpa se opone a la suma diligencia o cuidado*" [Emphasis added].

2132. Colombian law thus differentiates between three levels of negligence – *culpa grave*, *culpa leve* and *culpa levísima*. *Culpa grave* is defined as

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[2118] CL-13; English translation:
"Article 63. <FAULT [*CULPA*] AND *DOLO*>. The law distinguishes three kinds of fault [*culpa*] and lack of care.
Gross fault [*culpa grave*], gross negligence, *lata culpa*, is fault that consists of not managing others' affairs with the care that even negligent or careless persons usually use in their own affairs. This fault in civil matters is equivalent to *dolo*.
Minor fault [*culpa leve*], minor lack of care, slight lack of care, is the absence of the diligence and care that men usually use in their own affairs. Fault or lack of care, without any other description, means ordinary fault or lack of care. This kind of fault is opposed to ordinary or average diligence or care.
A person who should administer a business as a good father of a family is responsible for this kind of fault.
Very minor fault [*culpa levísima*] or lack of care is the absence of the careful diligence that a judicious man uses in the administration of his important affairs. This kind of fault is opposed to the highest degree of diligence or care.
Dolo consists of a positive intention to inflict injury on the person or property of another" [Tribunal's clarifications in parentheses].

> "*no manejar los negocios ajenos con aquel cuidado que aun las personas negligentes o de poca prudencia suelen emplear en sus negocios propios*",
>
> or "not managing others' affairs with the care that even negligent or careless persons usually use in their own affairs".

2133. The Parties' experts agree that an obligor acts with *culpa grave*[2119]

- If his/her conduct shows a significant lack of consideration of the creditor's interest in the performance of the contract, or
- If the obligor fails to manage the creditor's business with the level of care that even negligent or imprudent people usually employ in the management of their own business.

2134. Reficar's expert, Prof. Solarte, uses similar terms: *culpa grave* takes the form of serious breaches, with a failure to use the minimum care expected or with extreme negligence, that would not be committed by even the most careless person[2120] – a description with which Prof. Arrubla does not disagree. The only point made by CB&I's expert is that the standard for *culpa grave* is very high and that findings of *culpa grave* by adjudicators are rare[2121].

2135. The above standard is also confirmed by Colombian scholars:

- Prof. Cubides Camacho states that

  > "*culpa grave [...] consiste en una negligencia extrema que no cometen ni aun las personas más descuidadas*"[2122];
  >
  > [*culpa grave* [...] is extreme negligence that not even the most careless people commit[2123]"],

- Prof. Velásquez Gómez has classified *culpa grave* as "*muy torpe*"[2124] or "very clumsy" conduct[2125].

2136. In sum, *culpa grave* under Colombian law may be seen as reckless disregard of the interests of the counterparty, made visible through breaches that even a negligent or imprudent person would not have undertaken in the management of their own business.

B. Burden of proof

2137. Art. 1604 of the CCC provides[2126]:

[2119] JER 8 on Colombian Law, Issue 81, pdf pp. 60-62.
[2120] Solarte Rebuttal ER, para. 85.
[2121] JER 8 on Colombian Law, Issue 83, Prof. Arrubla's Comments, pdf p. 63.
[2122] CL-0469, p. 272 (pdf p. 3).
[2123] English translation taken from Solarte Rebuttal ER, fn. 84 at pdf p. 30.
[2124] CL-0201, p. 687 (pdf p. 2).
[2125] CL-0201, p. 687 (pdf p. 4).
[2126] RL-320, English translation: "[...] The burden of proof is assigned to the party who wishes to employ it; proof of a fortuitous case to the party who alleges it".

> "*ARTICULO 1604. <RESPONSABILIDAD DEL DEUDOR>.*
>
> *[...] La prueba de la diligencia o cuidado incumbe al que ha debido emplearlo; la prueba del caso fortuito al que lo alega*".

2138. As the Tribunal has already established in para. 1027 *supra,* under Colombian law in contractual relations there is a presumption of *culpa*: it rests on the defendant to prove that he/she applied the requisite standard of care. When a person enters into a contract, he/she is bound to act diligently and the burden of proving that this threshold has been met, falls upon his/her shoulders; negligence is presumed, unless the person who should have used diligence or care proves otherwise. As explained by a Prof. Castro de Cifuentes[2127],

> "*Es decir, en principio se presume su culpa, admitiéndose evidentemente la prueba en contrario para desvirtuar tal presunción*".

2139. The same is stated by Prof. Cubides Camacho[2128]:

> "*En materia civil, tratándose de responsabilidad contractual, el articulo 1604 del Código, al prever que "la prueba de la diligencia o cuidado incumbe al que ha debido emplearlo" establece una especie de presunción de culpa y dispone para desvirtuarla la probanza de la diligencia debida*".

2140. Prof. Cubides Camacho continues, however, in explaining that the presumption does not apply whenever an accusation is made of *culpa grave*[2129]:

> "*Desde luego, por virtud de la equiparación de la culpa grave y el dolo, aquella debe probarse como este, inclusive en los eventos de responsabilidad contractual, en los cuales, a pesar de presumirse la culpa del incumplido y tener él la carga de la prueba de su diligencia y cuidado, si el contratante perjudicado con el incumplimiento endilga al incumplido una culpa grave, porque, por ejemplo, aspira a que se den los efectos propios del dolo, es obligado a probarla*" [Emphasis added].

2141. For this reason, while CB&I was under the presumption of having been negligent in the performance of the EPC Contract, the burden of proving that CB&I breached its obligations under the EPC Contract with *culpa grave* lies with Reficar.

[2127] CL-0711, p. 8 (source p. 179); English translation:
"In other words, their fault is presumed in principle, obviously admitting evidence to the contrary to disprove the presumption".
[2128] CL-0469, p. 273 (pdf p. 4). English translation (pdf p. 7):
"In civil matters, when it comes to contractual liability, Article 1604 of the Code, by providing that "the proof of diligence and duty of care lies with the one who has had to use it" it establishes a kind of presumption of negligence and stipulates in order to distort it, the evidence of due diligence".
[2129] CL-0469, p. 274 (pdf p. 5). English translation (pdf p. 8):
"Of course, by virtue of equivalence of the gross negligence and *dolo*, it has to be proven as such, even in the event of contractual liability, in which, despite presuming the negligence of the individual in breach and having the burden of proof of his diligence and care, if the contracting party damaged by the breach foists a gross negligence on the individual in breach, because, for example, it pursues the effects inherent to *dolo*, it is obliged to prove it".

C. Criteria for finding *culpa grave*

2142. There is no one-size-fits-all test under Colombian law that could in abstract solve all cases with allegations of *culpa grave*. To the contrary, as stated by Prof. Velásquez Gómez, a determination of *culpa grave* must be made on the basis of each factual scenario:

> "*No toda persona se comporta de manera idéntica ante un mismo hecho, sin que, por lo tanto, se pueda dejar el lado la valoración de las circunstancias que lo rodean. En otros términos, el hecho no se puede aislar de su contorno, de la realidad*"[2130].
>
> ["Not everybody behaves in the same way concerning one same fact, without, omitting an appraisal of surrounding circumstances. In other words, facts cannot be separated from their context – from reality"[2131].]

2143. Prof. Velásquez Gómez also gives an illustrative example comparing the level of care that is required of an obligor depending on the item that is being cared for:

> "*Nadie puede dudar que la conducta que desempeña el hombre no es la misma cuando se le exige cuidar un lápiz de poco valor, a cuando se le exige cuidar una joya de enorme valor. La experiencia muestra que el común de las gentes cuidará con mayor énfasis la joya que el lápiz*"[2132].
>
> ["No one can doubt that a man's conduct is not the same when he is required to take care of a pencil of little value, as when he is required to take care of a jewel of enormous value. Experience shows that the average person will take more care of the jewel than the pencil"[2133].]

2144. Keeping in mind the above need to look closely at the facts when establishing the requisite standard of care, the Tribunal has full freedom to exercise its own judgment in weighing the evidence marshalled by the Parties and establishing whether the conduct of any of the parties complies or fails to comply with this standard. CB&I's legal expert, Prof. Arrubla, accurately invokes the principle of logical and reasonable rules of evaluation under Colombian law, according to which the adjudicator is "completely free to form his or her own opinion on the probative merit that the means of proof offer"[2134].

2145. What criteria should the Tribunal then adopt to weigh the available evidence and to conclude whether CB&I breached its obligations with *culpa grave*?

2146. The Parties have offered a catalogue of available criteria (**a.**), which the Tribunal will contrast against the relevant case law (**b.**), to establish the applicable test (**c.**).

[2130] CL-0201, p. 703 (pdf p. 3).
[2131] CL-0201, p. 703 (pdf p. 5).
[2132] CL-0201, p. 703 (pdf p. 3).
[2133] CL-0201, p. 703 (pdf p. 5).
[2134] JER 8 on Colombian Law, Issue 84, comments by Prof. Arrubla, pdf p. 64.

a. The Parties' positions

2147. Reficar, supported by its legal expert, points to a number of factors that the Tribunal should take into account when assessing whether CB&I acted with *culpa grave*:

- the results of the performance: analysing cumulatively[2135] the difference between what the Parties had agreed to and the final result of the Contract[2136],
- the existence of multiple breaches[2137];
- referring to essential obligations[2138];
- the magnitude of the harm caused by such breaches[2139];
- the high value of the Project[2140] and of the interests involved[2141];
- the foreseeability of harm, *i.e.*, CB&I's awareness of the risks involved in the Project and of the grave repercussions of a breach of its contractual obligations[2142];
- the failure to adopt measures to prevent clearly foreseeable harm[2143];
- impermissible behaviour by a professional obligor, taking into account his experience and sophistication[2144].

2148. CB&I's expert, Prof. Arrubla, accepts that the *culpa grave* assessment may be based on several criteria, but he takes issue with the suitability of the following three[2145]:

- the existence of multiple breaches (i.),
- the magnitude of the harm (ii.),
- the type of obligation breached (whether it is an essential or non-essential one) (iii.).

2149. (i.) The Tribunal will not apply the criterion of multiple breaches, as it considers such criterion inapposite in the circumstances of the present case, and thus does not need to refute Prof. Arrubla's counterargument.

[2135] Reply, paras. 171-176, citing to CL-0368, paras. 764, 771, CL-0469, p. 272, CL-0369, p. 42.
[2136] Reply, paras. 185-189, citing to an analysis under French law under CL-0365, pp. 434-435 and the previously quoted arbitrations under Colombian law, CL-0799, p. 46 and CL-0075, p. 114 and Solarte Rebuttal ER, para. 88.
[2137] Solarte Rebuttal ER, para. 118.
[2138] Solarte Rebuttal ER, para. 118.
[2139] Solarte Rebuttal ER, para. 118.
[2140] Reply, para. 190, citing to Solarte Rebuttal ER, para. 87.
[2141] Solarte Rebuttal ER, para. 118.
[2142] Reply, para. 191, citing to CL-0075, p. 104 and CL-0800.
[2143] Solarte Rebuttal ER, para. 118.
[2144] Solarte Rebuttal ER, para. 118.
[2145] JER 8 on Colombian Law, Issue 84, Comments by Prof. Arrubla, pdf pp. 64-65.

2150. (ii.) As regards the magnitude of the harm, Prof. Arrubla, says that the existence and seriousness of the damage cannot be an element proving *culpa grave*, because the existence of the breach is independent of its magnitude and must be proven separately; otherwise, the Tribunal would follow the fallacy of "begging the question"[2146].

2151. The Tribunal disagrees.

2152. Proving the existence (and magnitude) of the damages is indeed a different requirement of civil liability, autonomous from *culpa grave*. The Tribunal does, however, believe that the extent of the damages can be helpful in assessing the obligor's conduct and the seriousness of the breach.

2153. (iii.) Finally, as regards the nature of the breached obligation, Prof. Arrubla makes a valid point that both essential and non-essential obligations may be breached with different levels of *culpa*[2147]; however, this does not mean that in establishing whether the obligor acted with *culpa grave*, the Tribunal should not take the nature of the breached obligation into consideration when assessing the seriousness of the obligor's *culpa*.

* * *

2154. As both Parties agree, the Tribunal will use a multi-pronged test to establish whether Respondents acted with *culpa grave*. In order to determine the criteria relevant for the finding of *culpa grave* the Tribunal needs to contrast the Parties' opinions with Colombian case law.

b. Case law

2155. Before analyzing these criteria for the existence of *culpa grave,* the Tribunal will briefly review Colombian case law on the matter, by first addressing seminal decisions by the Colombian Supreme Court of Justice ["**Colombian Supreme Court**"] (**i.**) and then arbitral rulings decided under Colombian law in construction disputes (**ii.**).

(i). Supreme Court of Justice

2156. The Parties and their legal experts have referenced only a limited number of disputes decided by Colombian courts.

2157. The seminal case concerns a 1958 Colombian Supreme Court ruling, in which the decision of the Superior Tribunal of Barranquilla was overturned, due to its erroneous interpretation of the concept of *culpa*, in a case where a Mr. Birbragher recklessly accused a Mr. Lara Nieto of theft[2148].

2158. The Colombian Supreme Court decision elaborates on the proper interpretation of *culpa* under Colombian law. It employs the terms "*culpa consciente*" or "conscious

[2146] JER 8 on Colombian Law, Issue 84, Comments by Prof. Arrubla, pdf p. 65.
[2147] JER 8 on Colombian Law, Issue 84, Comments by Prof. Arrubla, pdf p. 65.
[2148] CL-0800, p. 140 (pdf p. 6).

negligence" and "*culpa inconsciente*" or "unconscious negligence" and its findings are applicable to any scenario where *culpa*, including *culpa grave*, is contemplated.

2159. (i) *Culpa consciente*, qualified as "more serious" or "*más grave*", concerns situations "*[c]uando el autor conoce los daños que, pueden ocasionarse con un acto suyo pero confió imprudentemente en evitarlos*"[2149].

> ["When the agent knows the damages that can occur as a result of his acts but imprudently believes he can avoid them"[2150].]

2160. (ii) *Culpa inconsciente* occurs "*[c]uando el autor no prevé el daño que pueda causarse con un acto suyo, pero hubiera podido preverlo, dado su desarrollo mental y conocimiento de los hechos*"[2151].

> ["When an actor cannot foresee the type of damages that have been caused by his acts but could have nonetheless prevented [the harm which caused] them given [...] his knowledge of the facts"[2152].]

2161. The Colombian Supreme Court used these two scenarios of *culpa* to establish that the applicable standard is objective rather than subjective:

> "*la capacidad de prever no se relaciona con los conocimientos individuales de cada persona, sino con los conocimientos que son exigidos en el estado actual de la civilización para desempeñar determinados oficios o profesiones*"[2153].
>
> [The capacity to foresee [the harm] is not related to the knowledge of each person but rather the knowledge which is required at the current stage of society to perform specific occupations or professions[2154].]

2162. The conclusion for the present case is that Reficar is not required to prove that CB&I acted with actual knowledge (or foresight) that its actions would breach the Contract; instead, Reficar must only prove that a sophisticated contractor such as CB&I would have foreseen that Respondents' actions would breach the Contract.

Colombian Supreme Court ruling of 2014

2163. Another, more recent case decided by the highest court in Colombia discussed by the Parties, is a judgment delivered on July 31, 2014, in which the Colombian Supreme Court applied the following standard for gross negligence[2155]:

[2149] CL-0800, p. 136 (pdf p. 4).
[2150] CL-0800, pdf p. 7.
[2151] CL-0800, p. 136 (pdf p. 4).
[2152] CL-0800, pdf p. 7.
[2153] CL-0800, p. 136 (pdf p. 4).
[2154] Translation by the Tribunal.
[2155] CL-0065, pp. 93-94, English translation by the Tribunal:
"In other words, from this perspective, *culpa grave* is evaluated according to a specific standard: 'the average conduct of the common man [...] [T]he negligence or imprudence that gives rise to gross negligence must be [...] of a magnitude characterized by disproportion and notorious infrequency. It is not enough, then, that the acts in question be clearly careless; they must also be clearly exceptional in the environment in which the respective activity is carried out [...]. It is with this orientation that authorized scholars have

> "*Esto es, que desde esa óptica la culpa grave se evalúa en función de una pauta concreta: 'la conducta media del hombre común [...]. [L]a negligencia o la imprudencia que da lugar a la culpa grave deba revestir [...] una magnitud caracterizada por la desmesura y la notoria infrecuencia. No basta, pues, que se trate de actos de claro descuido, sino que, además, se requiere que tengan un carácter palmariamente excepcional en el medio en el que se desenvuelve la respectiva actividad [...]. Con esa orientación es que autorizados doctrinantes han precisado que la culpa grave comporta 'una negligencia, imprudencia o impericia extremas, no prever o comprender lo que todos prevén o comprenden, omitir los cuidados más elementales, descuidar la diligencia más pueril, ignorar los conocimientos más comunes'*" [Emphasis added].

2164. The Tribunal observes that the above test refers to elements proposed by Prof. Solarte, such as the magnitude of the breach; the test also speaks of extreme imprudence, disregarding the most basic diligence, which is precisely the level of negligence identified by the Tribunal in the preceding analysis of Art 63 of the CCC.

> [The test also speaks of "notorious infrequence" and "exceptional character" of the actions tainted by *culpa grave*; however, this criterion should be viewed as a qualifier of the degree of recklessness rather than the frequency with which decision-makers should make findings of *culpa grave*.]

(ii). Arbitral decisions

2165. The Tribunal understands that the Parties agree that for construction disputes in particular, arbitral decisions rendered by tribunals applying Colombian law offer sufficient persuasive value to assist the Tribunal in its analysis.

2166. The Parties have drawn the Tribunal's attention to a number of such awards, in which arbitral tribunals applying Colombian law found *culpa grave*[2156]. The Tribunal will focus on the main case used by each Party: *Consorcio Ferrovial SAINC v. Carbones del Cerrejón Limited* ["***Consorcio Ferrovial***"][2157] cited to by Claimant and *Edificio Centro de Comercio Internacional v. INHISA S.A.* ["***Edificio Centro de Comercio Internacional***"][2158] – by Respondent.

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specified that *culpa grave* entails 'extreme negligence, imprudence or inexperience, not foreseeing or understanding what everyone foresees or understands, omitting the most elementary care, neglecting the most puerile diligence, ignoring the most common knowledge'" [Emphasis added].

[2156] See e.g.:
CL-0079, p. 60 – with regard to the use of pipes that did not conform with the norms for transmitting potable water;
CL-0080, p. 22 – with regard to a transport company failing to adopt security measures that would have prevented the theft of the goods that were stolen *en route*;
CL-0368, paras. 774-782 – with regard to a construction consortium that presented a work plan that it knew beforehand it was incapable of meeting.

[2157] CL-0368.

[2158] RL-0144.

Consorcio Ferrovial

2167. In this ICC case decided in July 2017, the underlying facts concerned a mining company contracting with a construction consortium to build an expansion to its infrastructure. At one point, the mining company terminated the contract, which led the consortium to initiate an arbitration. The consortium requested the payment of the costs of certain items it had constructed, stand-by costs, general expenses and demobilisation costs, among others. The owner brought a counterclaim, alleging serious breaches of schedule, failure to meet project milestones and abandonment of works, among others, all of which, in the owner's view, were committed with *culpa grave*.

2168. Due to the expansion project being a highly complex endeavour, involving significant costs, the tribunal set the requisite amount of care for the consortium as the highest standard of diligence:

> "*el estándar de diligencia [...] más alto: el que corresponde a un profesional altamente especializado en el trabajo que se le encomienda*"[2159].
>
> ["the one that corresponds to a highly specialized professional in the work that was commissioned to it"[2160]].

2169. The majority of the tribunal sided with the mining company, and found that the consortium had indeed acted with *culpa grave*, because the results of its actions were simply unjustifiable:

> "*En síntesis, todo parecería indicar que, por razones que resultan difíciles de entender, el Contrato desbordó la capacidad de planeación, concepción, programación y ejecución del Consorcio. Es explicable que se hubiera presentado incumplimiento o demoras por circunstancias específicas respecto de ciertos ítems o aspectos del proyecto. Pero no resulta fácil entender o justificar un incumplimiento casi sistemático de todo el Contrato*"[2161].
>
> ["In summary, everything would seem to indicate that, for reasons that are difficult to understand, the Contract went beyond the Consortium's ability to plan, foresee, schedule, and perform. It is understandable that there would be breaches or delays due to specific circumstances regarding certain items or aspects of the project. However, it is not easy to understand or justify an almost systematic breach of the entire Contract[2162]"] [Emphasis added].

2170. Particular emphasis was placed by the tribunal on the fact that the consortium presented to the owner a work plan with, full knowledge that it was unachievable:

> "*En particular, cabe destacar que de la prueba en estas actuaciones ha quedado comprobado [...], que como ha sido alegado por Cerrejón, el Consorcio presentó fechas en su plan de trabajo relativas al suministro del Jack-Up que sabía de antemano no podía cumplir. Este proceder es al menos*

[2159] CL-0368, para. 763, p. A204 (pdf pp. 209-210).
[2160] CL-0368, para. 763, p. A204 (pdf p. 258).
[2161] CL-0368, para. 776, p. A212 (pdf p. 217).
[2162] CL-0368, para. 776, p. A212 (pdf p. 266).

> *gravemente culposo y posiblemente doloso, no solo por su entidad, sino además por su impacto negativo en el Camino Crítico atento a la utilización programada de los Jack-Ups en la realización de los trabajos por mar y su empleo efectivo para ejecutar los de tierra desde el mar*"[2163].
>
> ["In particular, it should be stressed that the evidence in these proceedings has proved [...] that, as claimed by Cerrejón, the Consortium submitted dates in its work plan regarding Jack-Up supply that it knew beforehand it could not meet. This way of acting is at the least grossly negligent and possibly fraudulent, not only because of its consequence, but also because of its adverse impact on the Critical Path, given the scheduled use of the Jack-Ups in carrying out marine work and their effective use in performing the land work from the sea"[2164]] [Emphasis added].

2171. Other particular factors considered by the tribunal to be indicative of *culpa grave* included the fact that the consortium[2165]:

- abandoned the works,
- presented a faulty risk matrix,
- failed to follow the repeated calls of the counterparty to comply with its contractual obligations,
- suspended the works as a result of a strike, and
- failed to deliver to the owner relevant information on the delivery date of certain materials or equipment.

2172. The Tribunal finds the award in *Consorcio Ferrovial* particularly persuasive as it has been upheld by the Colombian Supreme Court after being brought to annulment proceedings by the consortium[2166].

Edificio Centro de Comercio Internacional

2173. Respondent in turn relies primarily on *Edificio Centro de Comercio Internacional*.

2174. The tribunal in *Edificio Centro de Comercio Internacional* established that the applicable standard for *culpa grave* is

> "*la conducta que consiste en no manejar los negocios ajenos con aquel cuidado que, aun las personas negligentes o de poca prudencia, suelen emplear en sus negocios propios*"[2167],

[2163] CL-0368, para. 781, p. A213 (pdf p. 218).
[2164] CL-0368, para. 781, p. A213 (pdf p. 267).
[2165] CL-0368, para. 774, pp. A211-A212 (pdf pp. 216-217 and 266-267 for the translation).
[2166] CL-0369, p. 59: "*Resuelve Primero. Declarar infundado el recurso de anulación del laudo internacional formulado por las sociedades SAINC INGENIEROS CONSTRUCTORES S.A. y FERROVIAL AGROMAN S.A.[...] frente al laudo arbitral de fecha 19 de julio de 2017 [...]*".
[2167] RL-0144, p. 59.

> ["conduct which consists in not managing the interests of others with the care that even negligent and imprudent persons apply in their own business"[2168]],

thus reiterating the text of Art. 63 of the CCC.

2175. Applying this standard to the facts of the case, the tribunal found that a contractor acted with *culpa grave* when it installed fire-hose water piping instead of piping designed for drinking water[2169]:

> "*Inhisa S.A.[...] NO empleo la debida diligencia y cuidado profesional que implica su condición profesional y el alcance que conllevan la obra de instalación de la nueva tubería para la conducción de agua potable [...]*".
>
> ["Inhisa S.A. […] DID NOT apply the required diligence and professional care implied by its professional status and the scope of work involved in the installation of the new drinking water pipeline […]"[2170]] [Capitals in the original].

2176. In finding *culpa grave*, the tribunal rather than explaining in detail why the applicable standard was met, stated that it was simply unexplainable for the contractor to have exhibited such an egregious level of carelessness:

> "*No de otra manera se explica que – a pesar de esos factores que jugaban a su favor – en la ejecución de ese contracto, esa empresa hubiera incurrido en errores tan graves como instalar para la conducción de agua potable una tubería que, según los estándares reconocidos en la actividad de la ingeniería Hidráulica, no es apta para la conducción de ese liquido sino para conducir agua destinada a apagar incendios [...]*"[2171].
>
> [It cannot be explained otherwise that – despite these factors that played in its favour – in the execution of this contract, this company had committed such serious errors as installing a pipe for the conduction of drinking water that, according to the recognized standards in the activity of hydraulic engineering, is not apt for the conduction of this liquid but to carry water destined to extinguish fires [...]"[2172].

2177. The Tribunal will apply the same reasoning when evaluating CB&I's conduct.

c. <u>The applicable test</u>

2178. Having analysed the opinions of both Parties' legal experts and the Colombian jurisprudence presented by the Parties, the Tribunal finds that in establishing *culpa grave*, the Tribunal must pay special attention to:

- The significance of the obligation that was breached;

[2168] Translation by the Tribunal.
[2169] RL-0144, p. 59.
[2170] Translation by the Tribunal.
[2171] RL-0144, p. 59.
[2172] Translation by the Tribunal.

- The magnitude of the damage caused by the breach;

- The attitude shown by the party in breach towards the foreseeable damage.

2179. If the obligation breached was essential, the magnitude of the damage caused was significant, and the attitude of the party in breach was reckless, the Tribunal will find that the requirements of the legal definition in the CCC of *culpa grave* have been met: "not [manage] others' affairs with care that even negligent or imprudent people usually employ in the management of their own business".

2.4. DETERMINATION OF *CULPA GRAVE*

2180. In the current Section, the Tribunal will apply the three-pronged test under Colombian law to the facts of the case and find that CB&I breached its cost and schedule control obligations with *culpa grave*.

A. Significance of the obligation breached

2181. The first criterion concerns the nature of the breached obligations: if these obligations were essential, *i.e.*, if significant interests were enshrined in them, then there is a higher likelihood that their breach amounted to *culpa grave*. If, however, the breach concerned an obligation of ancillary nature, *i.e.*, of minor interest, this could be indicative that the *culpa* did not qualify as *grave*.

2182. CB&I breached its Cost and Schedule Control Commitments. The question is, thus, whether the Cost and Schedule Control Commitments were essential obligations in the EPC Contract. The answer is in the affirmative: cost-related obligations are always essential to any construction contract, because the basic obligations assumed by the contractor is to construct at an agreed price (or reasonably within cost predictions) and within a fixed timeframe.

2183. But, even more so, in this case, where the Parties placed special importance on the Cost and Schedule Control Commitments:

2184. First, the material nature of the Cost and Schedule Control Commitments, for both Parties, is enhanced by the following facts:

- The Cost Control Commitments provided Reficar with the protection that assuaged its fears as to entering into a cost-reimbursable EPC Contract (which was CB&I's preferred cost-modality, as it would shift the risk of cost overruns on Reficar), as opposed to a lump sum, where it would be CB&I running that risk;

- The Schedule Control Commitments were also essential for both Parties, with the clear obligation to reach Mechanical Completion of the Project by February 2013: finalizing the works within the agreed timeframe was a fundamental requirement for success and would earn CB&I a bonus, while the alternative scenario of delays would result in the accrual of liquidated damages and prolongation costs.

2185. Second, the Tribunal has previously established that the relationship between Reficar and CB&I was not that of a typical, arms-length construction contract.

2186. The Parties agreed that CB&I would be bound by a Heightened Diligence Obligation under para. 3 of the Project Execution Plan[2173]:

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own" [Emphasis added].

2187. CB&I agreed that its contractual role would not be that of a mere contractor; instead, CB&I accepted to become a contractor *cum* mandatary[2174], with the obligation to construct the Project and the right to be reimbursed by the Owner, but subject to a fiduciary obligation that all costs (and schedule) decisions taken must safeguard Reficar's resources as if its own.

2188. The existence of this additional bond between the Parties speaks to a heightened level of legitimate trust that Reficar could and did place on CB&I's representations as to the estimated Project costs and Mechanical Completion date – a trust that CB&I breached:

- When CB&I submitted the Representation Letter, it guaranteed, with a +/- 5% accuracy, that costs would amount to USD 4 billion, yet they ended up reaching USD 5.9 billion, with a large amount of the Excess Costs being foreseeable by the Cut-Off Date; in fact, the cost forecast from September to October 2012 alone rose by a staggering USD 1.25 billion, without any explanation by CB&I;

- Similarly, when Reficar expressed worries regarding a possible delay, CB&I assuaged its fears assuring that the Mechanical Completion date would not be altered; during the July 19, 2011 Reficar BofD meeting Mr. Deidehban was asked for certain explanations about the status of the Project[2175] and he explained that a critical unit was affected by a 2.4% delay, but "the guaranteed mechanical completion date should not be adjusted on the basis of the issue"[2176]; yet, only six months later, CB&I's projected date of Mechanical Completion was moved by more than half a year[2177] and, eventually, Mechanical Completion occurred with a delay of 725 days[2178].

2189. The Tribunal notes that in *Consorcio Ferrovial*, analysed *supra*, another ICC tribunal deciding under Colombian law found that a contractor acted with *culpa grave* when it presented a work plan it was aware was unachievable. The abrupt changes in the schedule presented by CB&I suggest that CB&I, being aware of unavoidable delays, was prepared to knowingly submit unachievably optimistic predictions.

[2173] JX-002, p. 654; JX-004, p. 628.
[2174] See Section VII.2.1.3.1.1 *supra*.
[2175] Ex. C-0429, p. 5.
[2176] Ex. C-0429, p. 5.
[2177] Ex. C-0088, p. 4: "The late deliveries of Substations, Isometric Production, Pipe Fabrication, and Tank Farm Modifications have pushed the Mechanical Completion of the Project to 19 September 2013". The Tribunal notes that the 203 days are imputable to Reficar. Still, CB&I had a duty to keep Reficar updated on any projected delays to the Project Schedule.
[2178] Out of the total of 725 days of delay, 334 are imputable to CB&I and 391 to Reficar, pursuant to the analysis in Section VII.2.3 *supra*.

2190. In sum, CB&I breached the Cost and Schedule Control Commitments, all of which were essential obligations under the Contract thereby evidencing that it acted with *culpa grave*. Furthermore, there is no plausible explanation for CB&I's failure to provide precise and trustworthy cost and time estimations, other than that it acted with *culpa grave*.

B. Magnitude of the breach and damage caused

2191. The second criterion concerns the magnitude of the breach (**a.**) and the foreseeable damage caused by the breach (**b.**): if the breach was material and/or led to a significant harm, this is indicative of *culpa grave*.

a. Magnitude of the breach

2192. The purpose of the Cost and Schedule Control Commitments was to guarantee that the Project would be built for a cost and within a time frame equal to, or as close as possible, to the estimates provided by CB&I.

2193. The failure to control costs on the EPC Project is visible from the findings on liability made in this Award:

- the total amount awarded by the Tribunal as Improper Costs (USD *circa* 800 million) is almost ten-times higher than the total aggregate Liability Cap (USD 87.75 million),
- the Improper Costs were not motivated either by events outside of the Parties' control or by events for which Reficar is responsible – all potential Excluded Costs have already been discounted by the Tribunal,
- the Improper Costs are almost six-times the amount that CB&I itself expected to earn on the Project as gross profit: USD 135 million[2179],
- on their own, the Improper Costs would amount to the costs of another large-to-mega-project[2180].

2194. As with costs, the magnitude of CB&I's breach of the Schedule Control Commitments is daunting: the Parties agreed in June 2010 for CB&I to deliver the Project by February 2013; the Project ended up being delivered two years after the Guaranteed Mechanical Completion Date agreed by the Parties in the Contract, in February 2015. Thus, the Project ended up lasting almost twice as long as had been agreed.

2195. The Tribunal has found that CB&I was solely responsible for a total of 334 days of delay – nearly a year. In the Tribunal's view, a delay of almost a year on a Project originally scheduled to only take a total of two and a half years serves as a further indication of the sheer magnitude of CB&I's failings.

[2179] USD (million) 800/135= 5.925925(...) or 5.93.

[2180] See B&OB ER, para. 32 for a definition of megaprojects as opposed to large projects. See also Ex. B-004, pdf p. 9.

CB&I's counterargument

2196. CB&I argues that it could not have breached its Schedule Control Commitments with *culpa grave*, because only less than a half of the number of days of delay to the Project schedule can be attributed to CB&I's sole responsibility[2181].

2197. The Tribunal disagrees.

2198. What matters to determine the magnitude of the breach is that CB&I issued a Representation Letter making a representation as to the +/- 5% accuracy of the schedule predictions. And after that representation, the delay attributable to CB&I still amounted to around a year.

2199. In sum, if the Project were CB&I's own, it is highly unlikely that CB&I would have allowed the costs to explode by almost USD 800 million and the schedule by almost a year. Because CB&I did so, the Tribunal finds the magnitude of CB&I's breaches and damage caused as indicative of it acting with *culpa grave*.

b. Damage caused

2200. As regards damages, from early on in the Project CB&I was fully aware that it was in continuous breach of both the Cost and Schedule Control Commitments and that such breach would cause harm in the form of Excess Costs (including prolongation costs).

2201. The most obvious manifestation of the damage is, thus, in the form of Excess Costs[2182].

2202. But there is an added negative effect: these Excess Costs could provoke personal liability of Reficar's management. Reficar is a company owned by the Colombian State, through Ecopetrol. As public companies, their expenses are public expenditures, and subject to review by the *Contraloría* – a powerful entity entrusted with the supervision of public expenditures[2183] and empowered by law to charge Ecopetrol's and Reficar's officers with public offences and personal responsibility, if (in the *Contraloría*'s judgment) they had failed to properly control public expenditure.

2203. There is ample evidence that Reficar informed CB&I, and that CB&I was perfectly aware, of the interests at stake, if the Cost and Schedule Control Commitments were not observed[2184] – and that, notwithstanding this awareness, CB&I failed to take any remedial action.

2204. Summing up, the Tribunal finds that the damage caused by the breach of the Cost and Schedule Control Commitments was significant, and that such harm was foreseeable – this being another indicator of CB&I's *culpa grave*.

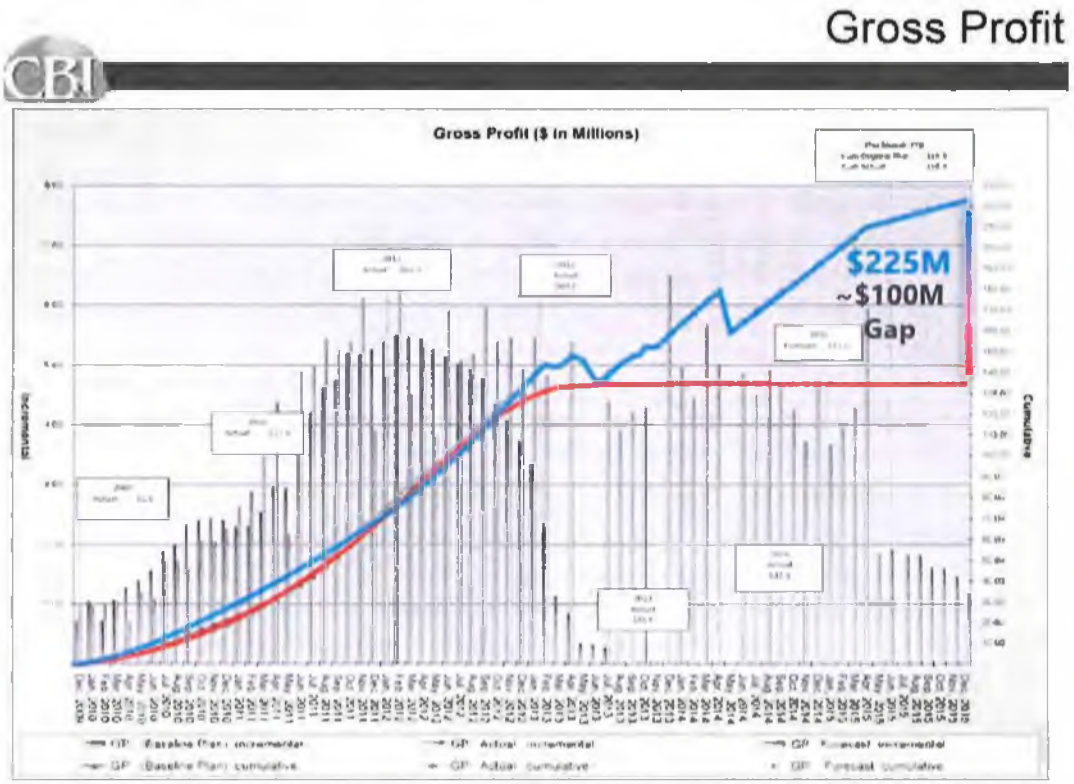
[2181] RPHB, para. 221.
[2182] See Section VII.2.1 *supra*.
[2183] JER 11 on Colombian Fiscal Liability Law, Issue 6, pdf pp. 5-9.
[2184] See e.g., Ex. C-0094; Ex. C-0095; Ex. C-0097; Ex. C-0115; Ex. C-0121; Ex. C-0136.

Self-dealing by CB&I

2205. Respondents' breach did not only cause damages to Reficar, but at the same time, it also led to CB&I's own enrichment.

2206. In accordance with the provisions on remuneration in the EPC Contract, CB&I was initially entitled to earn USD 175.75 million[2185] – an amount which CB&I subsequently readjusted to USD 135 million in its internal projections[2186].

2207. However, the graph below, which is a slide from CB&I's Project Manager Review presentation at the end of the Project[2187], shows that CB&I finally managed to obtain USD 225 million in gross profits, which represents an additional unexplained profit of USD 90 million:



2208. Are there convincing explanations for this additional profit?

2209. A possible explanation could be Change Orders, which significantly increased the size of the Project; the accepted change orders, however, only amount to USD 10.5 million[2188]. Another possible explanation is the Health and Security Bonus, which

[2185] See discussion under Pre-Contractual Liability Section VII.1.1.7.B.
[2186] See Mr. Deidehban's testimony at Tr. 1497:23-1498:7.
[2187] Ex. C-1329, p. 36. The version used by the Tribunal is the one presented by Claimant in CPHB, para. 18.
[2188] ESOD, fn. 14, p. 16; CB&I simultaneously argues that Reficar rejected most of such extra work WNOCs, see RPHB, para. 479.

CB&I only achieved in 2010[2189]. This still leaves unexplained gross profits in the amount of almost USD 80 million, or over 50% more than agreed with Reficar.

2210. At the Hearing, the Tribunal asked Mr. Deidehban about potential sources of additional revenue, apart from the Fixed Fee arrangement, fee mark-up for Change Orders and the various performance bonuses CB&I was entitled to. When pressed on the issue, Mr. Deidehban mentioned rate arbitrage – the difference between the rate at which Reficar reimbursed to CB&I the cost of indirect hire labour and the salaries CB&I actually satisfied to these indirect hire employees[2190]:

> "The slight difference may be just an issue with the reporting, but there is no, it's – we took up the contingency that we left for ourselves in the to get us to 175.5, plus the additional incrementals we had from change order approvals and that, and if there would have been anything in the rate arbitrage, but there wouldn't have been any – it wouldn't have been that significant".

2211. The existence of profit resulting from rate arbitrage is relevant: the longer the Project went on, and the more indirect hire employees were employed, the higher CB&I's profit. Despite Reficar's best efforts to limit any devious incentives for CB&I through the fixed fee remuneration structure, ultimately CB&I stood to benefit from the Project languishing from February 2013 to February 2015.

2212. This finding was confirmed in the witness statement of CB&I's former employee, Mr. Ernest Breaux[2191]:

> "[…] [CB&I construction block managers'] attitude was that since the Project was under a cost reimbursable contract structure, efficiency was not a priority for them. Indeed, the view of CB&I was that the longer the job went on, the more money CB&I would make" [Emphasis added].

2213. Reficar's Mr. Suárez also confirmed at the Hearing Reficar's preoccupation about CB&I's interest in prolonging the Project due to its rate arbitrage-related profits[2192]:

> "The contract said that, for indirect hire, rates had been agreed upon, labour rates, and within these labour rates and the contract, of course, also establishes what scope that rate covers. I mean, for the lodging, catering, whatever, as determined in the contract. So for each indirect hire, there was a given rate that had to cover all those costs, plus salaries, and indemnity payments, health scheme payments, all that is required by law. But this is my belief because what happened that – the rate had to cover all what I have just mentioned, and certainly and additionally, there should be a plus to that. Why? Because the one that negotiated how the salary to be paid to each person was CB&I. So in

[2189] CB&I does not bring to the Tribunal's attention the actual amount earned, or any underlying documents. See Wright Counterclaim ER, p. 60; Counterclaim ESOC, paras. 168-169, citing to Deidehban RWS, para. 68 (with no reference) and documents Ex. R-1525 and R-1526, both of which contain a number of Excel Sheets with a compilation of Onshore and Offshore accounting records without any possibility for the Tribunal to identify the relevant invoices.
[2190] Tr. 1498:18-1499:1.
[2191] Breaux CWS, para. 55.
[2192] Tr. 1888:19-1889:12.

> these rates, there was ultimately a possibility for an economic profit" [Emphasis added].

2214. There were additional, ancillary benefits for CB&I, deriving from the extended duration of the Works:

- CB&I had a secure source of revenue for its employees: the engineers, procurement team, construction supervisors, over the years of delay,
- It could report to its investors that it was working on a project of great value,
- It could advertise itself as being entrusted with this highly important Project, and
- It could cover the costs of its Island Park facility, which apparently had been underperforming prior to being entrusted with certain works for the Project[2193].

2215. Thus, the Tribunal finds that the evidence proves that CB&I obtained additional profits from the extended duration of the Works (mainly, through rate arbitrage). This self-dealing is indicative of CB&I having breached the Cost and Schedule Control Commitments with *culpa grave*.

C. Reckless attitude

2216. According to the CCC, *culpa grave* is the failure to manage others' affairs with even less care than that expectable from a negligent or imprudent person managing their own business.

2217. The Tribunal notes that the very definition of the Cost Control Commitments encompasses some *culpa grave* notions:

> "Even though a reimbursable contract CB&I project management will rigorously control cost and schedule similar to a lump sum contract safeguarding Reficar resources as if their own" [Emphasis added].

2218. The relevant point is, thus, whether in failing to safeguard Reficar's resources, CB&I deployed a degree of care that was below the standard expected from a negligent or imprudent person.

2219. *Res ipsa loquitur*: cost overruns amounting to more than USD 800 million and achieving Mechanical Completion two years after the guaranteed date to do so, with a year's time of solely-caused delays, can only be interpreted as the result of a reckless disregard for controlling costs and schedule. There is ample evidence to prove this averment:

2220. First, Mr. Deidehban, CB&I's highest officer on the Project, conceded that the standard for submitting costs to Reficar was[2194]:

[2193] See para. 1249 and supporting evidence *supra*.
[2194] Tr 1127:17-1127:18.

> "If I incurred costs associated with the work, they are reimbursable".

2221. Mr. Suárez, Reficar's Deputy Project Manager (and later Project Director), confirmed this[2195]:

> "I was shocked to see CB&I's Project Team adopt an attitude that the Project would 'cost whatever it cost' and frequently state that 'it is what it is.' These are phrases I heard several times from CB&I's management team on the Project, including from Mr. Deidehban himself" [Emphasis added].

2222. And so did Mr. Houtz, Reficar's engineer[2196]:

> "Reficar made constant requests for explanations as to why CB&I was incurring delays and ever increasing hours. During many of these meetings Mr. Deidehban would simply say that 'it is, what it is' and 'this is a cost reimbursable contract.' Indeed, the phrase 'it is, what it is' became CB&I's motto and was repeated to us on many occasions. [...] Second, CB&I would then argue that Reficar was interfering with its means and methods (which was not true) and, ultimately, end the discussion by telling again us that "it is, what it is" [Emphasis added]".

2223. The above statements show no degree of care on CB&I's side when incurring costs.

2224. Second, the reckless disregard to controlling cost and schedule are reflected in CB&I's contemporaneous communications from 2013, which prove that it believed to be entitled to all costs submitted for reimbursement, according solely to its judgment, and regardless of its duty of care:

> "Whether the schedule is extended to August 31, 2013, August 22, 2014 or any other date, CB&I is entitled to be compensated for extended performance costs associated with that time extension"[2197], and

> "While CB&I acknowledges that it does not have a "blank check" to enlist unlimited resources, Reficar is nonetheless required to approve those resources that CB&I reasonably deems necessary to enable its means and methods in performing the Work[2198]" [Emphasis added].

2225. Third, the Tribunal is convinced that the above-mentioned attitude contributed to CB&I's inaction vis-à-vis the increase in costs – CB&I did not believe it was breaching the Contract, did not contemplate increasing costs as damages and, hence, it did not take actions to mitigate the over-run. CB&I did not take any responsibility for the situation it had created.

2226. The Tribunal is convinced that, had CB&I treated the Project as a lump sum contract in which cost overruns risks lay with CB&I – as it should, according to the Cost Control Commitments – costs would not have increased the way they did.

[2195] Suarez CWS, para. 80.
[2196] Houtz CWS, para. 193.
[2197] Ex. C-0102, p. 2.
[2198] Ex. C-0378, p. 4.

2227. It is worth noting that by September 2012, the Monthly Forecast had reached USD 4.221 billion[2199] (which is higher, but still reasonably close to the Representation Forecast), but by October 2012, just one month later, the estimation had skyrocketed to USD 5.467 billion[2200], an increase of some USD 1.25 billion (or 23%). Had CB&I treated overrun costs as if they came out of its own pocket, the reaction would have been to implement immediate cost reduction measures. No reasonable contractor would simply accept that its profits will decrease by USD 1.25 billion, without trying to avoid such outcome by all possible means.

2228. But CB&I took no cost reduction action. It simply presented the new augmented cost estimations as a *fait accompli*, assuming no responsibility for the Excess Costs it was causing.

2229. The same is true for the Project schedule: after making a representation as to the +/- 5% accuracy of the schedule, the delay attributable to CB&I amounted to around a year; indicating a reckless disregard to Reficar's interests.

2230. In sum, CB&I's failed to honour its Cost and Schedule Control Commitments in a reckless way, taking no responsibility for the spiralling costs and schedule, and failing to implement mitigation actions, as if the business were its own – thereby acting with *culpa grave*.

2.5. CONCLUSION

2231. CB&I's breaches of the Cost and Schedule Control Commitments meet all of the criteria under the three-prong test applied above:

- The Cost and Schedule Commitments were all essential obligations;
- The breaches by CB&I were material and led to foreseeably significant damages;
- CB&I showed recklessness, taking no responsibility for the increases in costs and time and failing to adopt mitigating actions.

2232. As a result, the Tribunal finds that CB&I breached its Cost and Schedule Control Commitments with *culpa grave*. Thus, the Liability Caps do not find application to the damages awarded as a result of those breaches.

CB&I's counterarguments

2233. CB&I brings two counterarguments which would prove that it could not have acted with *culpa grave*: first, because only major construction errors could amount to *culpa grave* and there are no such allegations by Reficar (i.), and second, because findings of *culpa grave* are fundamentally rare (ii.).

2234. (i.) CB&I suggests that on an EPC contract, such as the one between the Parties, only major construction errors could be indicative of the contractor acting with

[2199] Ex. C-0093, pp. 4, 39.
[2200] Ex. C-0096, p. 13; the Tribunal notes that the same document offers different ranges for the reforecast at p. 17.

culpa grave[2201]. CB&I bases its argument on the decision in *Edificio Centro de Comercio Internacional*.

2235. But the decision in *Edificio Centro de Comercio Internacional* does not, at any point, posit that *culpa grave* in the performance of construction contracts may only be found with regard to the performance of construction activities. It only so happens that in the factual circumstances of that case, the contractor's *culpa grave* took the form of severe construction errors, that resulted in installing piping that could not serve its purpose. But that does not in any way preclude the current Tribunal's finding that CB&I acted with *culpa grave* in breaching its Cost and Schedule Control Commitments.

2236. (ii.) CB&I also argues that, because the standard for finding *culpa grave* is so high, it is fundamentally rare for courts or tribunal to issue decisions finding this standard to be met.

2237. CB&I's argument is misguided.

2238. Although CB&I does not provide any underlying data for its proposition, the Tribunal notes that the 2014 Colombian Supreme Court ruling analysed *supra* under the Subsection 2.3.C.b on case law mentions the "notorious infrequence" and "exceptional character" of the actions tainted by *culpa grave*, But the Tribunal has already clarified that such qualifications only have a bearing on the required degree of negligence; it is not a guideline for decision-makers to limit its power to find for *culpa grave*.

2239. Even if, *arguendo*, CB&I were correct about the actual infrequency of decisions finding *culpa grave*, this would not impact this Tribunal's decision. The facts of the current case – the only controlling factor for the Tribunal's decision – have been analysed in this Section and are compelling: CB&I acted with *culpa grave* and no statistics on frequency can change this.

2240. In any event, the Parties have pointed the Tribunal to a number of decisions under Colombian law with a positive finding of *culpa grave*, which further defeats CB&I's argument.

Dolo

2241. Reficar makes a subsidiary argument that CB&I's actions also amounted to contractual *dolo*.

2242. The Tribunal need not address this argument as the finding of *culpa grave* is sufficient to decide that the amounts awarded for CB&I's breaches of Cost and Schedule Control Commitments fall outside the scope of the Liability Cap.

2.6. ANALYSIS UNDER NEW YORK LAW

[2201] ESOD, para. 1456.

2243. The Tribunal is convinced that its finding of CB&I having acted with *culpa grave* with regard to the Cost and Schedule Control Commitments is sufficient to disapply the Liability Caps. In an abundance of caution, however, the Tribunal will make a finding that the result of the analysis would be the same, applying the concept of gross negligence under New York law.

A. The Parties' positions

2244. Reficar's standards for gross negligence under New York law include conduct that:

- "evinces a reckless indifference to the rights of others"[2202],
- constitutes "a failure to use even slight care, or conduct that is so careless as to show complete disregard for the rights and safety of others"[2203], or
- "smacks of intentional wrongdoing"[2204].

2245. Reficar cites to *F. D. Borkholder Co., Inc. v. Sandock*, in which a construction company was found to have acted in gross negligence when, building an additional room to a pre-existing structure, it knowingly[2205]:

- Failed to fill a wall suffering from a moisture problem with concrete and shortened the roofline, contrary to design plans,
- Later assured the owner that the moisture problem was caused by simple condensation, which was not the case, and
- Finally promised to fix the moisture problem but never did.

2246. Reficar additionally references *Internationale Nederlanden*. In this case, the note holders of a company that subsequently entered into bankruptcy accused a trust company tasked with managing the company's voting by failing to correctly transmit the note holders' votes on distribution options, leading to the invalidity of their ballot and severe resulting monetary damages[2206]. The New York Court of Appeals specifically found that "several acts of negligence with foreseeably severe cumulative effect", in this case the discrete acts of failure to properly manage the votes submitted by note holders, can in aggregate constitute gross negligence, citing to *Food Pageant*[2207].

2247. Reficar also cites to *Hyatt v. United States*[2208], a case in which the New York court found gross negligence on the basis of a totality of circumstances[2209]. Another case cited to by Reficar, *Bothmer v. Schooler, Weinstein, Minsky & Lester, P.C.*,

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[2202] ESOC, para. 806, citing to *Johnson v. Smith*, 2006 N.Y. Misc. LEXIS 2618, at *27 (N.Y. City Ct. Sept. 8, 2006), CL-0122, * 42 at pdf p. 14.
[2203] ESOC, para. 805, citing to New York Pattern Jury Instructions - Civil § 2:10A, CLA-0124.
[2204] ESOC, para. 806, citing to *Sommer*, 79 N.Y.2d at 554 (citation and alteration omitted), CL-0123.
[2205] ESOC, para. 807, citing to *F.D. Borkholder Co., Inc. v. Sandock*, 413 N.E.2d 567, 568 (Ind. 1980), CL-0126.
[2206] CL-0684.
[2207] CL-0684, para. 5 on pdf p. 5.
[2208] CL-0680.
[2209] Reply, para. 179, citing to *Hyatt v. U.S.*, 968 F.Supp. 96, 111 (E.D.N.Y. 1997).

according to Reficar contains phrasing that suggests that the degree of negligence could rise if the negligent action persisted over the course of years[2210].

CB&I's position

2248. CB&I argues that under New York law, there is no precise definition of "gross negligence" but that there is unanimous agreement that there is a need to meet a "high bar" to make such a finding[2211]; gross negligence "is clearly intended to represent something more fundamental than failure to exercise proper skill and/or care"[2212].

2249. According to CB&I, the test for finding gross negligence was elaborated under *Radiology and Imaging Specialists*:

> "a compelling demonstration of egregious intentional misbehavior evincing extreme culpability: malice, recklessness, deliberate or callous indifference to the rights of others, or an extensive pattern of wanton acts"[2213],

and *Matter of Part 60 Put-Back Litig*

> "when invoked to pierce an agreed-upon limitation of liability in a commercial contract, must smack of intentional wrongdoing or evince a reckless indifference to the rights of others"[2214].

2250. Other definitions cited by CB&I include conduct which "smacks of intentional wrongdoing"[2215], "conduct that evinces a reckless disregard for the rights of others"[2216] and "the failure to exercise even slight care"[2217] – but not merely "misguided" or "over-hasty pursuit" of one's contractual duties[2218].

2251. In addition, CB&I argues that the presence of "material causative factors for which [the defendant] is not liable" also precludes a finding of gross negligence[2219].

[2210] Reply, para. 179, citing to *Bothmer v. Schooler, Weinstein, Minsky & Lester, P.C.*, 266 A.D.2d 154 (N.Y. App. Div. 1999).
[2211] RPHB, para. 512.
[2212] ESOD, para. 1472, citing to *Red Sea Tankers Ltd. v. Papachristidis (The Ardent)* [1997] 2 Lloyd's Rep. 547, 586.
[2213] RPHB, para. 512, citing to *Radiology and Imaging Specialists*, 2021 WL 149027, at *2 (internal quotations omitted).
[2214] RPHB, para. 512, citing to *Matter of Part 60 Put-Back Litig.*, 36 N.Y.3d at 352 (internal quotations omitted).
[2215] ESOD, para. 1467, citing to *Red Sea Tankers Ltd. v. Papachristidis (The Ardent)* [1997] 2 Lloyd's Rep. 547, 581(Comm) (emphasis added) and *Matter of New York City Asbestos Litig.*, 89 N.Y.2D 955, 956–57 (1997).
[2216] ESOD, para. 1467, citing to *Gold Connection Discount Jewelers v. Am. Dist. Tel. Co.*, 212 A.D.2d 577, 578 (2d Dep't 1995).
[2217] ESOD, para. 1467, citing to *Food Pageant v. Consol. Edison Co.*, 54 N.Y.2d 167, 172 (1981).
[2218] ESOD, para. 1468, citing to *Red Sea Tankers Ltd. v. Papachristidis (The Ardent)* [1997] 2 Lloyd's Rep. 547, 622 (Comm).
[2219] ESOD, para. 1478, citing to James Pickavance & James Bowling, "Exclusions from Immunity: Gross Negligence and Wilful Misconduct", Address at the Society of Construction Law (Sept. 5, 2017).

B. Tribunal's analysis

2252. The Tribunal, having reviewed both Parties' submissions, finds that the standard for gross negligence under New York law is in substance very similar to that of *culpa grave* under Colombian law. To make a finding of gross negligence, it is necessary to establish the existence of the same degree of culpability, namely "reckless disregard" for the rights of the counterparty.

2253. The Tribunal is confident that its previous test for *culpa grave* under Colombian law may also serve to establish that CB&I acted with gross negligence under New York law.

2254. The tests used by New York courts and invoked by CB&I are undoubtedly met by CB&I's breaches of the Cost and Schedule Control Commitments; for the purposes of comprehensiveness, the Tribunal will address three such decisions using its previous findings:

2255. (i) *Red Sea Tankers Ltd:*

> "[gross negligence] is clearly intended to represent something more fundamental than failure to exercise proper skill and/or care"[2220].

2256. CB&I did not simply fail to exercise proper skill and/or care; it allowed cost overruns of some USD 800 million and delays in Mechanical Completion of two years, with one year's worth of solely-caused delay – this proves a spectacular, rather than ordinary, failure by CB&I to control cost and schedule.

2257. (ii) *Radiology and Imaging Specialists*:

> "a compelling demonstration of egregious intentional misbehavior evincing extreme culpability: malice, recklessness, deliberate or callous indifference to the rights of others, or an extensive pattern of wanton acts"[2221],

2258. The magnitude of the results of CB&I's breaches serve as a compelling demonstration evincing extreme culpability. CB&I would not have allowed for such ballooning of cost and time overruns unless it showed callous indifference to Reficar's rights.

2259. (iii) *Matter of Part 60 Put-Back Litig:*

> "when invoked to pierce an agreed-upon limitation of liability in a commercial contract, must smack of intentional wrongdoing or evince a reckless indifference to the rights of others"[2222].

2260. The Tribunal's previous findings hold CB&I responsible for behaviour which shows its reckless disregard to the rights of Reficar, which means that CB&I's gross

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[2220] ESOD, para. 1472, citing to *Red Sea Tankers Ltd. v. Papachristidis (The Ardent)* [1997] 2 Lloyd's Rep. 547, 586.
[2221] RPHB, para. 512, citing to *Radiology and Imaging Specialists*, 2021 WL 149027, at *2 (internal quotations omitted).
[2222] RPHB, para. 512, citing to *Matter of Part 60 Put-Back Litig.*, 36 N.Y.3d at 352 (internal quotations omitted).

negligence may rightfully be invoked to pierce the agreed-upon Liability Cap in the EPC Contract.

CB&I's counterargument

2261. One particular example that CB&I invokes as alleged proof of a very high standard for finding gross negligence under New York law, is *Tougher Industries*[2223]; however, CB&I gives an incomplete picture of this decision.

2262. The New York Supreme Court in that case did not decline to make a finding of gross negligence despite finding "a multitude of design errors and other issues", as claimed by CB&I[2224]. Instead, the Court did not find gross negligence because of the existence of additional provisions in the contract that made the counterparty responsible for

- examining the project site and accepting it, and
- finalizing and updating the project schedule, which was prepared so poorly that it constituted the reason for the claim of gross negligence of the defendant[2225].

2263. Thus, this was a case of dismissing a claim of gross negligence due to the existence of material contributory negligence, rather than a failure to find gross negligence because "only the most egregious, knowing actions" can amount to a finding of gross negligence, as claimed by CB&I[2226].

2264. The Tribunal has not found contributory negligence on Reficar's part in the current case and thus CB&I's counterargument is inapposite.

2265. CB&I also uses *Tougher Industries* to argue that "misguided" or "over-hasty pursuit" of contractual duties does not amount to gross negligence.

2266. The Tribunal does not disagree with the clarification under *Tougher Industries*.

2267. The argument is, however, unhelpful to CB&I, as its breaches of the Cost and Schedule Control Commitments did not arise because CB&I was "misguided" – in fact, it was fully aware of the clearly foreseeable damages of its failures.

2268. In addition, CB&I engaged in the opposite of an "over-hasty pursuit" of its contractual obligations: it allowed for the delays to accumulate while at the same time benefitting from each day Mechanical Completion was pushed back in time, as proven by the evidence on record.

* * *

2269. Summing up, even by applying New York law, the Tribunal reiterates its finding that the Liability Caps do not find application to the damages awarded for CB&I's

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[2223] *Tougher Indus., Inc. v. Dormitory Authority,* 130 A.D.3d 1393, 1396 (3d Dep't 2015).
[2224] ESOD, para. 1468.
[2225] RL-263, pdf p. 2.
[2226] ESOD, para. 1468.

breaches of the Cost and Schedule Control Commitments, because those damages arose from CB&I's gross negligence.

Willful misconduct

2270. Taking into account the Tribunal's finding that CB&I breached the Cost and Schedule Control Commitments with gross negligence and that, as a result, the Liability Caps are not applicable, a further analysis of willful misconduct under New York law would be moot.

VIII.2. SET-OFF AND LIQUIDATION

2271. The Tribunal has established that CB&I owes Reficar USD 1,008.41 million, which comprises:

- USD 845.4 million due to the breach of the Cost Control Commitments,
- USD 152.75 million due to the breach of the Schedule Control Commitments, and
- USD 10.3 million due to the breach of CB&I's obligation to provide the Works free of defects.

2272. Reficar, in turn, owes[2227]:

- To CB&I UK: USD 914,939 under the Offshore Contract, and
- To CBI Colombiana: COP 28,256,049 under the Onshore Contract,

for unpaid invoices.

2273. Both Parties have asked the Tribunal to perform a set-off of the amounts awarded[2228].

1. AUTHORITY TO SET-OFF

2274. As an initial matter, under Colombian law, set-off of mutually due, liquid obligations expressed in monetary terms[2229] operates as a matter of law (*ipso iure*)[2230]:

> "*ARTICULO 1714. <COMPENSACIÓN> Cuando dos personas son deudoras una de otra, se opera entre ellas una compensación que extingue ambas deudas, del modo y en los casos que van a explicarse*".

2275. The amounts awarded by the Tribunal are, without a doubt,

- mutually due (either from CB&I to Reficar or from Reficar to CB&I),
- liquid (as of the Liquidation Date, as analysed *infra*), and

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[2227] See para. 1524 *supra*.
[2228] CPHB, para. 498; RPHB, para. 675, request for relief g.
[2229] Art. 1715 of the CCC, RL-691:
"*ARTICULO 1715. <OPERANCIA DE LA COMPENSACION> La compensación se opera por el solo ministerio de la ley y aún sin conocimiento de los deudores; y ambas deudas se extinguen recíprocamente hasta la concurrencia de sus valores, desde el momento que una y otra reúnen las calidades siguientes:*
1.) Que sean ambas de dinero o de cosas fungibles o indeterminadas de igual género y calidad.
2.) Que ambas deudas sean líquidas; y
3.) Que ambas sean actualmente exigibles.
Las esperas concedidas al deudor impiden la compensación; pero esta disposición no se aplica al plazo de gracia concedido por un acreedor a su deudor".
[2230] Art. 1714 of the CCC, also RL-0794, pdf pp. 3-12

- expressed in monetary terms (the set-off will only be performed for amounts expressed in USD).

2276. The Parties have, under the Coordination Agreement, specifically agreed that Reficar would have set-off rights for any amounts it is owed under one contract against amounts it owes to CB&I under another contract[2231]:

> "3.5 Set-Off
>
> The Contractors agree and accept that there may be circumstances in which it may be to the advantage of the Owner to set-off the amount owed to the Owner under one of the Contracts against amounts owed by the Owner under the other Contract. Neither of the Contractors shall contend, whether in legal proceedings or otherwise, that the Owner is not entitled to exercise such rights of set-off, provided that the Owner may only set-off amounts in accordance with the terms and conditions of the relevant Contract".

2277. Both Parties accept that Reficar's above prerogative extends to the Tribunal, which is empowered to perform a set-off of the amounts owed by each party to the counterparty[2232].

Limitation

2278. There is, however, a limitation to the Tribunal's power to order a set-off between the awards amounted under the claims with those awarded under the counterclaims.

2279. As correctly pointed out by CB&I, Art. 17, para. 2 of Colombian Law 1116 of 2006 prohibits movements of assets (including set-offs) of companies which are subject to judicial liquidation proceedings without a prior authorisation by the judge[2233]:

> "*A partir de la admisión al proceso de insolvencia, de realizarse cualquiera de los actos a que hace referencia el presente artículo sin la respectiva autorización, será ineficaz de pleno derecho* [...]".
>
> ["From the moment of the admission of the insolvency process, if any of the operations referred to in this article are performed without the respective authorization, they will not have legal effect *ipso jure* [...]"].

2280. As of the most recent update to the Tribunal, CBI Colombiana is an entity in the process of judicial liquidation[2234].

2281. For this reason, the set-off ordered by the Tribunal cannot impact the COP 28,256,049 credit which CBI Colombiana holds vis-à-vis Reficar – the only credit which can be off-set is CB&I UK's credit for USD 914,939. (The prohibition of set-off does not affect CBI Colombiana's joint and several liability under Section VIII.2.4 *infra*)

[2231] JX-007, p. 33.
[2232] CPHB, para. 498; RPHB, paras. 635-642.
[2233] RPHB, para. 639, fn. 1412.
[2234] Letter from the Liquidator dated November 11, 2020.

2. DATE FOR THE SET-OFF

2282. Both Parties agree that the Tribunal should set off all amounts as of a single date rather than attempting to perform different set-offs at various stages of the Project[2235].

2283. As to the specific date of set-off, Reficar simply refers to the EPC Agreement's provisions on contract liquidation[2236] and acknowledges that the Tribunal has full discretion. Whereas CB&I argues that the Tribunal should perform the set-off as of the date of the Award, because this is the time when, under Colombian law, "the amount of the debts will become liquid, undisputed, due, and owing"[2237].

2284. The Tribunal sides with Claimant.

2285. The proper date for set-off is the agreed date for the liquidation of the EPC Contract [the "**Liquidation Date**"], because TC 78.3 provides that, as of that date, the Parties' reciprocal accounts are to be settled:

> "78.3 Once the Agreement has been liquidated, the Owner will pay the Contractor, if applicable, any amounts outstanding in respect of the Work that result from the Liquidation, subject to any applicable withholdings and deductions".

2286. Which is the appropriate Liquidation Date in the present situation?

2287. TC 78.1 provides the guiding principle. The EPC Agreement should be liquidated within three months of either[2238]:

- the completion of all Works plus the Owner certifying that the Works have successfully undergone the performance tests, or
- the termination of the Agreement.

2288. Given that the Agreement has not been terminated, the first alternative is applicable: the Liquidation Date should fall three months after the completion of all Works and after the certification by Reficar that the performance tests have been successful.

2289. In the present case, the Works were never formally finalized (and there is no evidence that Reficar ever issued documentation confirming the successful testing

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[2235] CPHB, para. 499; RPHB, para. 636.
[2236] CPHB, paras. 499-500.
[2237] RPHB, para. 640.
[2238] TC 78.1, JX-002, p. 267; JX-004, p. 242:
"78.1 Within the three (3) months (or such longer period as the Parties may agree) following the earlier of the date of:
(i) completion of all the Work (other than Defect warranty obligations) and the issue by the Owner of the Performance Certificate; or
(ii) termination of this Agreement for cause or for convenience in accordance with TC64 and TC65, respectively,
the Contractor and the Owner shall proceed to the Liquidation of the Agreement [...]".

of the Refinery). But there is evidence in the record showing when CB&I stopped working on the Project and performed its demobilisation:

- Mechanical Completion was achieved in February 2015, but thereafter CB&I continued performing certain activities, such as completing Category "A" Check Sheets and "A" Punchlist items (see Section on Improper Delay *supra*);

- CB&I demobilised from the construction site in Cartagena in the fall of 2015; Reficar acknowledges that CB&I left the Project in October 2015[2239];

- The Refinery began preliminary operations in November 2015[2240].

2290. Taking all the evidence into consideration, CB&I ceased performing Works on the Project around October 2015. Adding three months, as per TC 78.1, brings the Liquidation Date to the end of 2015.

2291. For these reasons, the Tribunal decides that the proper Liquidation Date of the EPC Agreement should be December 31, 2015, and that this date should also be used for the set-off of reciprocally owed credits.

3. APPLICATION

2292. The consequence of set-off is that the reciprocal credits held by two persons, who are creditors of each other, are deemed paid and settled in the concurring amount, as of a certain date.

2293. Applying this principle, Reficar's claim against CB&I UK deriving from this Award, in an amount of USD 1,008,410,000, should be deemed partially paid and settled through set-off, against CB&I UK's counterclaim against Reficar in an amount of USD 914,939, as also adjudicated in this Award, resulting in a net credit held by Reficar against CB&I UK in an amount of USD 1,007,495,061.

2294. Reficar must, however, pay the amounts awarded under the Offshore Contract to CBI Colombiana for unpaid invoices, in an amount of COP 28,256,049.

2295. There is an additional amount that the Tribunal must take into account for purposes of set-off: the USD 70 million that Reficar has already obtained under the Performance LoC, as analysed under Section VII.2.2.3 *supra*. The amounts awarded to Reficar must be reduced by these USD 70 million already collected by Reficar, to avoid that Claimant obtains double recovery. Thus, the amount in USD to which Reficar is entitled in accordance with this Award is USD 937,495,061[2241].

4. JOINT AND SEVERAL LIABILITY OF THE CB&I RESPONDENTS

2296. So far, the Tribunal has treated the CB&I entities collectively; however, the three Respondents

[2239] CPHB, para. 1; ESOC, para. 598.
[2240] ESOC, para. 101.
[2241] 1,007,495,061-70,000,000= 937,495,061.

- CBI Colombiana S.A.,
- CB&I UK LTD., and
- Chicago Bridge & Iron Company N.V. (CB&I N.V.)

are corporations with separate legal personality.

2297. *Pro memoria*, Reficar entered into:

- the Offshore Contract with CB&I UK, mostly for the performance of engineering and procurement services, and
- the Onshore Contract with CBI Colombiana, mostly for the performance of construction works, while
- CB&I N.V. issued two Contractor Performance Guarantees in favour of Reficar; one in respect of the obligations of CB&I U.K.[2242], and another in respect of the obligations of CBI Colombiana[2243].

The Parties' positions

2298. One of the questions asked by the Tribunal after the conclusion of the Hearing concerned the status of the three CB&I entities in the arbitration: which among CB&I UK, CBI Colombiana and CB&I N.V. should be held liable for any damages potentially awarded by the Tribunal[2244].

2299. According to Reficar, CBI Colombiana and CB&I UK are jointly and severally liable for all claims in the arbitration; this is the result of applying the Coordination Agreement[2245]. Furthermore, Colombian law establishes the principle that, when there are several debtors, they are presumed to be jointly and severally liable[2246].

2300. CB&I acknowledges that CB&I UK and CBI Colombiana are indeed jointly and severally liable, under the Coordination Agreement[2247], but argues that first, Reficar has to prove that it is bringing separate claims against each of the companies under their respective contracts[2248]:

- CBI Colombiana under the Onshore Contract, and
- CB&I UK under the Offshore Contract.

2301. CB&I says that Reficar has failed to specify which claims it is bringing under which Contract, and has failed to argue its case under New York law, with the result that

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[2242] JX-008, pp. 17-32.
[2243] JX-008. 1-16.
[2244] Communication A 164.
[2245] JX-007, p. 40.
[2246] CPHB, para. 30 invoking Art. 825 of the Colombian Commercial Code: "In commercial contracts, when there are several debtors (contractors) there is a presumption that they are joint and severally liable" – no citation to exhibit.
[2247] RPHB, paras. 16, 21, 639.
[2248] RPHB, para. 21.

no claims are brought under the Offshore Contract; hence, Reficar cannot hold CB&I UK liable.

Discussion

2302. The Tribunal has already rejected Respondents' arguments under Section IV *supra*.

2303. The wording of the Coordination Agreement does not leave room for doubt:

> **"18. Joint and Several Liability**
>
> The liability and obligations of the Contractors under this Agreement and the Contracts shall be joint and several."

2304. In accordance with the Coordination Agreement, Reficar can bring its claims under the Onshore Contract or the Offshore Contract, and if either CBI Colombiana or CB&I UK is held liable for the breach of either of the Contracts, both companies will be jointly and severally responsible for any consequences which may arise out of that breach, including but not limited to paying damages.

Joint and several liability of CB&I N.V.

2305. CB&I N.V. is a guarantor. It issued a first performance guarantee in respect of CB&I U.K's obligations[2249], and another in respect of CBI Colombiana's obligations[2250].

2306. Reficar argues that CB&I N.V. is jointly and severally liable as guaranteeing "both payment and performance, and not merely collectability"[2251] and that it does so as "a primary obligor and not a surety"[2252]. Claimant adds that this is supported by the Parties' conduct – the three CB&I entities in the arbitration appear jointly as "CB&I"[2253].

2307. According to Respondents, Reficar has not advanced an indemnity claim against CB&I N.V[2254]. This CB&I entity will, thus, only become implicated if and when a separate claim is made against it, after the conclusion of the arbitration, assuming CB&I UK and CBI Colombiana cannot fully cover the amounts awarded by the Tribunal.

2308. Reficar replies that it invoked the Parent Guarantees as early as in April 2015[2255]:

> As a result, Reficar writes to invoke its rights under the Guarantees and requests that Chicago Bridge & Iron Company N.V. take immediate steps to cause CB&I to fully and promptly perform its duties, obligations, covenants, undertakings, including but limited to the following:

[2249] JX-008, pp. 17-32.
[2250] JX-008. 1-16.
[2251] JX-008 (Parent Guarantees) under para. 2 on p. 6 and para. 2 on p. 22.
[2252] JX-008 (Parent Guarantees) under para. 2.1(a) on p. 5 and para. 2.1 on p. 21.
[2253] CPHB, para. 32.
[2254] RPHB, para. 23.
[2255] CPHB2, p. 7, second row, responding to para. 23 of RPHB.

2309. Claimant adds that CB&I N.V. was included as primary obligor in the Statement of Claim[2256]; thus, Reficar is fully entitled to seek relief jointly and severally from all CB&I entities, including CB&I N.V.[2257].

2310. The Tribunal sides with Reficar.

2311. Reficar has clearly invoked the Parent Guarantees, and it did so prior to the commencement of the arbitration[2258]. In addition, CB&I N.V. has been one of the named Respondents in the case, ever since the filing of the RfA in 2016[2259].

2312. Furthermore, according to the Contractor Performance Guarantee Agreements, the Guarantor not only guaranteed the collectability of any potential debts unpaid by CBI Colombiana or CB&I U.K., but also both payment and performance of their respective obligations[2260]:

> **2.2 Payment and Performance**
>
> This Guarantee is a guarantee of both payment and performance, and not merely of collectability, and, until all Obligations have been irrevocably paid, discharged, met or performed in full, the Beneficiary may refrain from applying or enforcing any other moneys, security or rights held or received by the Beneficiary (or any trustee or agent on its behalf) in respect of those amounts, or apply and enforce the same in such manner and order as it sees fit (whether against those amounts or otherwise) and the Guarantor shall not be entitled to the benefit of the same.

2313. Since the payment and performance of CB&I UK and CBI Colombiana deriving from the EPC Contract has been adjudicated in the current Award, any liability found is automatically and immediately extended jointly and severally to CB&I N.V. as guarantor.

* * *

2314. For the reasons above, the Tribunal finds that Reficar may seek the relief awarded in the current arbitration from all three Respondents: CB&I UK, CBI Colombiana and CB&I N.V., all of which are jointly and severally liable.

5. LIQUIDATION OF THE CONTRACT

2315. Reficar requests that, through the resolution of the current dispute, the Tribunal[2261]:

- declare that the EPC Agreement is liquidated (**5.1.**);
- determine the EPC Agreement's appropriate value (**5.2.**), and

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[2256] ESOC, para. 841.
[2257] ESOC, para. 842.
[2258] Ex. C-0379, p. 2.
[2259] RfA, p. 1. "Chicago Bridge & Iron Company N.V., CB&I (UK) Limited and CBI Colombiana S.A. Respondents".
[2260] JX-008, Section 2.2; pp. 6, 22.
[2261] Reply, para. 1022; ESOC, para. 845.

- determine the Parties' remaining rights and obligations to one another, if any (**5.3.**).

2316. In turn, CB&I asks that the Tribunal declare that the EPC Agreement is still in full force and effect until it is liquidated[2262]:

> "[a] declaration that the EPC Contract is a valid and binding agreement on the parties, is still in full force and effect, and Reficar must reimburse CB&I for all reasonable and proper costs it incurs until the EPC Contract is liquidated".

5.1. DECLARATION OF LIQUIDATION

2317. TC 1 defines "Liquidation" as the settlement and discharge of any pending liabilities or obligations between the Parties, in order to permanently conclude the relationship between them under the EPC Agreement[2263]:

> "'Liquidation' means the procedure whereby both Parties, as provided in TC78, will detail the status of their liabilities and obligations under the Agreement and, to the extent agreed upon by them, will settle and discharge any pending liabilities or obligations, in order to permanently conclude the contractual relationship between them under this Agreement, irrespective of the Defects Correction Period and the obligations related to the correction of Defects".

2318. The main provision on liquidation in the EPC Agreement is TC 78, which provides the time frame and conditions, as well as its effects on both Parties' obligations.

2319. Reficar is now asking this Tribunal to liquidate the EPC Contract.

2320. CB&I demobilized from the Works site eight years ago and since that date has performed no additional construction activity; during this period the Refinery has been functioning under Reficar's management. CB&I has failed to provide any evidence that the EPC Contract is still being performed or is otherwise in full force and effect. What the evidentiary record shows is the contrary: that for more than eight years, neither CB&I has performed, not Reficar has demanded any performance under the EPC Contract. Given this lack of performance, for such a long time, the appropriate solution is to formally liquidate the Contract – and this is what the Tribunal will do, complying with Reficar's request.

2321. The question of the Liquidation Date has already been decided, when the Tribunal analysed and adjudicated the proper date for performing the set-off between the reciprocal credits held by Reficar and CB&I U.K. In the Tribunal's opinion, the appropriate Liquidation Date, which should also function as the proper date for set-off, is December 31, 2015.

5.2. VALUE OF THE EPC AGREEMENT

2322. Having established the Date of Liquidation, the EPC requires that the Tribunal quantify the value of the EPC Agreement. TC 58.1 provides that the actual value of

[2262] CB&I's Request for Relief z, ESOD, para. 1612.
[2263] JX-002, p. 167; JX-004, p. 153.

the EPC Agreement is to be determined by adding all amounts paid to CB&I to which it is entitled, plus all amounts to which CB&I is entitled but payment is still outstanding:

> "the actual value of this Agreement, as at the date of Liquidation, shall be determined by adding together the value of all amounts which Contractor has been paid, or is entitled to be paid, in each case in accordance with Section IV Article II".

2323. The Tribunal will thus perform the following calculation:

- The starting point is the actual amounts paid by Reficar to CB&I (USD 5,908.2 million);
- This amount must be reduced by the costs Reficar is entitled to claw-back (USD 845.4 million), arriving at USD 5,062.8 million,
- The result must be increased by the amounts Reficar paid to its PCS contractors for the correction of CB&I's defective Works (USD 10.3 million[2264]), arriving at USD 5,073.1 million,
- And also by the amounts awarded to CB&I under the counterclaim, for invoices that Reficar should have but has not paid (USD 0.9 million and COP 28.3 million), arriving at USD 5,074 million[2265], plus COP 28.3 million[2266].

2324. The total value of the EPC Agreement thus amounts to USD 5,074 million plus COP 28.3 million.

5.3. SURVIVING RIGHTS AND OBLIGATIONS

2325. As regards the Parties' surviving rights and obligations, as previously advanced in Section VII.2.6 *supra*, TC 76 provides guidance as to these obligations:

> "76.1 The rights and obligations of the Parties under TC1.1, 1.2, 1.3, 8, 15, 16, 17, 18, 19, 24, 44.3, 46, 56.1.21, 58.14, 59, 71, 75.2.2, 75.3.2, 75.5.4, 78, 79.1, 79.2 and 79.4 and this TC76.1 and relating to any waivers and disclaimers of liability, releases from liability, limitations of liability, indemnities, patent indemnities, confidentiality and to insurance shall continue in full force and effect regardless of whether the Work is completed or terminated and shall continue to be in full force and effect so as to protect each Contractor Group member and each Owner Group member from any loss or liability that it may incur after this Agreement is assigned, completed or terminated in accordance with its terms. Termination of this Agreement shall also be without prejudice to any accrued rights and obligations under this Agreement as at the date of termination".

[2264] The Tribunal is unable to quantify the amounts Reficar would have paid to CB&I for performing the same corrective works but considers the amounts paid by Reficar to its PCS contractors to be a reasonable approximation of these amounts.
[2265] 5,073,100,000 + 914,939 = 5,074,019,939 or 5,074 million.
[2266] 28,256,049 is rounded to 28.3 million.

2326. Therefore, the Parties have expressly foreseen which of their rights and obligations under the EPC Contract survive its liquidation. As such, these surviving rights and obligations will comprise:

- The survival clause under TC 76, which includes Indemnification Commitments, and

- The rights and obligations ordered by the Tribunal in the current Award.

VIII.3. INTEREST

2327. Both Parties are in agreement that any amounts awarded by the Tribunal should be increased by interest, pre- and post-award[2267].

2328. Section 4.21 of the DRA stipulates that any amounts awarded in the arbitration should be paid with interest[2268]:

> 4.21 [...] any Arbitration Award for the payment of money shall be paid in the currency or respective currencies for payment specified in the applicable Project Agreement or Project Agreements underlying the Dispute or Disputes and with interest [...]" [Emphasis added].

2329. There are two major points the Tribunal must establish regarding the interest: the relevant dates for the start and end of accrual (**1.**) and the applicable rate (**2.**).

1. START AND END DATE OF ACCRUAL

2330. Reficar offers two alternatives for the *dies a quo,* the date when the accrual of interest should start:

- a monthly basis relative to when Reficar actually expended additional funds on the basis of the expert analysis performed by Breakwater Forensics[2269],
- the mid-point between the start of the EPC Contract on June 15, 2010 and CB&I's demobilisation on October 12, 2015, *i.e.*, February 11, 2013[2270],

2331. When it comes to the *dies ad quem*, Reficar asks for post-award interest until the effective date of payment of the Award[2271].

2332. CB&I, on the other hand, simply references the text of the EPC Agreement and speaks of accrual "from the date of injury until payment" or, for late payments, "from the date such amount should have been paid"[2272]. CB&I and its expert, Compass Lexecon, do, however, heavily criticise the calculations of the monthly payments as presented by Reficar's expert[2273].

2333. The Tribunal is not convinced by the proposals of either Party.

2334. CB&I is correct in criticising the accuracy of the monthly payments schedules presented by Reficar's expert, because these schedules do not differentiate between payments of costs which were reasonable, proper and incurred in accordance with the Contract and payments of costs which failed to meet these requirements. Thus the analysis is of no help to the Tribunal. Reficar's subsidiary proposal of using

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[2267] ESOC, para. 824; Reficar's request for relief no. 35 under ESOC, para. 844; CB&I's request for relief no. ii, ESOD, para. 1612.
[2268] JX-007, p. 13.
[2269] CPHB, para. 507.
[2270] CPHB, para. 508, citing to LI ER, para. 349.
[2271] Reficar's request for relief no. 59; CPHB, para. 532.
[2272] RPHB, para. 643.
[2273] Compass Lexecon ER, Section IV.4 at pdf p. 105.

February 11, 2013 as the *dies a quo* would be unfair to CB&I, as at that point in time, the Works were still advancing and payments continued for at least two more years.

2335. CB&I's suggestion to calculate interest "from the date of injury" is also not helpful: as a consequence of the Bottom-Up approach, it is impossible to determine the exact date on which each Excess Cost arose.

2336. Taking into account its prior findings, the Tribunal decides that the Liquidation Date, as of which the final settlement of accounts is performed, constitutes the appropriate moment for starting the accrual of interest.

2337. As to the *dies ad quem*, both Parties are in agreement that it should be set as of the date of effective payment of any amounts awarded.

2338. Thus, the *dies a quo* used by the Tribunal for calculating interest shall be the Date of Liquidation, *i.e.*, December 31, 2015 and interest shall accrue until the date of effective payment of any amounts awarded by the Tribunal.

2. APPLICABLE RATES AND METHOD OF CALCULATION

2339. Claimant primarily requests that the Tribunal set pre-award interest at the level of Reficar's cost of capital[2274]. Claimant argues that Section 4.21 of the DRA allows the Tribunal to establish interest rates as it finds appropriate, and thus it permits to equate the rate of interest with Reficar's cost of capital (as calculated by Reficar's expert)[2275]. Subsidiarily, Reficar argues that the Tribunal should apply the contractual rate for late payments[2276].

2340. Respondents aver that the contractual interest rate should apply as the rate mutually agreed by the Parties[2277]. CB&I's expert cites to literature stating that whenever tribunals look for the appropriate interest rate, they should first look to the contract that has given rise to the dispute[2278].

2341. The Tribunal sides with CB&I.

2342. As a starting point, the Tribunal notes that Section 4.21 of the DRA grants it considerable leeway in its decision on interest. This Section provides a general rule[2279]:

> "any Award for the payment of money shall be paid [...] with interest accruing from the date of injury until payment at the rate or respective rates of interest accruing on late payments under the applicable Project Agreement or Project Agreements underlying the Dispute or Disputes";

[2274] CPHB2, pdf p. 28, response to para. 646.
[2275] CPHB2, pdf pp. 27-28, response to para. 643.
[2276] CPHB, para. 504.
[2277] RPHB, paras. 643-646.
[2278] RPHB, para. 646, and fn 1431 at pdf p. 274, citing to Compass Lexecon, para. 125, in turn citing to CLEX-026, Beeley, Mark and Richard E. Walck. 2014. "Approaches to the Award of Interest by Arbitration Tribunals". *The Journal of Damages in International Arbitration*, (April): 51-76, at 53 and 54.
[2279] JX-007, p. 13.

But then the provision adds a default option: the general rule (*i.e.*, the rate of interest on late payments) is to be applied

> "[u]nless otherwise decided in the Arbitration Award"[2280].

2343. Although the DRA grants this default option, the Tribunal sees no reason to deviate from the general rule agreed upon by the Parties: there is financial logic in extending the rate of interest agreed upon for late payments to amounts awarded under the present Award. That the late payments rate should apply is reinforced by the fact that Reficar uses this rate as an alternative to its primary request.

2344. The interest rate for late payments under the EPC Contract may be found under TC 58.12, which under the Onshore Agreement provides for an annual rate of LIBOR +2% rate for amounts in USD and DTF +2% rate for amounts in COP[2281]:

> "58.12 Late Payment
>
> […] if either Party fails to pay any amount which is due and payable under this Agreement by the fourteenth (14th) Day following the date (if any) by which it is required to make such payment, such amount shall bear interest (as well as before any judgement) at:
>
> 58.12.1 in case of amounts in US Dollars, a rate per annum which is equal to LIBOR plus 2%; and
>
> 58.12.2 in case of amounts in Colombian Pesos, a rate which is equal to DTF plus 2% […]" [Emphasis added].
>
> [The Offshore Agreement reiterates the above provision[2282].]

2345. The above terms "LIBOR" for the USD and "DTF" for the COP rates are both defined under the EPC Contract

> "'LIBOR' means the six-month US dollar London interbank offer rate as published by the British Bankers Association at approximately 11:00 a.m., London time, on the relevant Day"[2283];
>
> "'DTF' means the rate certified by the Central Bank of Colombia ("*Banco de la República*") for the week in which late interest is accrued as per the provisions of this Agreement, to be the offered rate for 90 days Colombian Peso certificates of deposit"[2284].

2346. TC 58.12 also specifies that the interest should be compounded daily[2285]:

> "58.12 Late Payment

[2280] JX-007, p. 13.
[2281] JX-002, p. 236; JX-004, p. 213.
[2282] JX-002, p. 236; JX-004, p. 213.
[2283] JX-002, p. 167; JX-004, p. 153.
[2284] JX-002, p. 164.
[2285] JX-002, p. 236; JX-004, p. 213.

[...]

The applicable interest rate shall be payable on demand and shall accrue from Day to Day and shall be compounded daily from the date such amount should have been paid until the date of actual payment in full of such amount and such interest" [Emphasis added].

2347. Based on the above, the Tribunal decides that CB&I must pay Reficar interest on the amounts awarded and denominated in USD, at the rate of LIBOR for six-month deposits, plus a margin of 2%, compounded daily, with accrual starting as of December 31, 2015 and continuing until the date of actual payment of all outstanding amounts. For the reasons expressed in Section VIII.2.4 *supra* CB&I UK, CBI Colombiana and CB&I N.V. are jointly and severally liable as regards the payment of interest.

2348. Reficar, in turn, must pay CBI Colombiana interest on the amounts awarded in COB, at the rate of DTF, plus a margin of 2% compounded daily, with accrual starting as of December 31, 2015 and continuing until the date of actual payment of all outstanding amounts.

LIBOR alternative

2349. The Tribunal notes that LIBOR is in the process of phasing out and for this reason the Tribunal must make contingencies and establish an alternative to LIBOR, should it cease to exist while interest is still accruing.

2350. The Tribunal posed this question to the Parties, and they provided the following answers[2286]:

2351. Reficar proposes that the Tribunal should use the DTF; alternatively, Reficar would not be opposed if the Tribunal selected an alternative benchmark, which is widely accepted as a replacement for LIBOR[2287].

2352. CB&I argues that the Tribunal should use the Secured Overnight Financing Rate ["**SOFR**"] as an alternative, as recommended by the Federal Reserve Board and the Federal Reserve Bank of New York[2288].

2353. The Tribunal sides with CB&I.

2354. The rate of interest that accrues on any amounts is inherently connected with the underlying currency; for this reason, it would be unreasonable for the Tribunal to follow Reficar's suggestion to apply the DTF rate, agreed by the Parties as the rate applicable to amounts awarded in COP, to amounts awarded in USD.

[2286] Communication A 164.
[2287] CPHB, para. 506.
[2288] RPHB, para. 644, citing to: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/ARRC_Press_Release_Term_SOFR.pdf.

2355. CB&I, on the other hand, offers a reasonable proposal: the SOFR has been recommended by two major authorities in the State of New York, in which the seat of the arbitration is located.

2356. That SOFR should be accepted as the alternative to LIBOR is confirmed by Reficar, who has pleaded that it would not oppose a decision of the Tribunal adopting a widely accepted alternative benchmark instead of LIBOR; the Tribunal has already found that SOFR is a widely respected benchmark in the State of New York.

2357. For these reasons, should LIBOR cease to exist while interest is still accruing, SOFR should replace the LIBOR rate. Since the applicable LIBOR rate is the six-month rate, the SOFR replacement, if applicable, should also reflect the six-month rate of that benchmark.

3. CONCLUSION

2358. In sum, the Tribunal has decided that:

- (i.) CB&I must pay Reficar interest on the awarded amount of USD 937,495,061, at the rate of six-month LIBOR +2%, compounded daily, accruing from December 31, 2015 until the date of payment.

- Alternatively, should LIBOR cease to exist by the time of payment of the above amounts, then CB&I must pay Reficar interest on the awarded amount of USD 937,495,061, at the rate of six-month LIBOR +2%, compounded daily, accruing from December 31, 2015 until the date when LIBOR ceases to exist, and at the rate of six-month SOFR +2%, compounded daily, accruing from that date, until the date of payment.

- (ii.) Reficar must pay CBI Colombiana interest on the awarded amount of COP 28,256,049, at the rate of DTF +2% compounded daily, accruing from December 31, 2015 until the date of payment.

IX. COSTS

2359. In accordance with Art. 37(4) of the ICC Rules, the Arbitral Tribunal shall fix the costs of the arbitration and decide which of the Parties shall bear them or in what proportion they shall be borne by the Parties.

2360. At the invitation of the Tribunal[2289], each Party presented its respective Statement of Costs[2290].

2361. The following subsections account for the Parties requests (**1.** and **2.**) and the Arbitral Tribunal's decision (**3.**).

2362. As the Tribunal will grant partial award on costs to both Parties, it will thereafter address the set-off of reciprocal credits adjudicated in the present Section (**4.**) and determine the applicable interest (**5.**).

1. CLAIMANT'S REQUEST

2363. Reficar requests the Tribunal an award of the costs of the arbitration incurred by Claimant, including attorneys' fees[2291].

2364. The Statement of Costs submitted by Claimant is as follows[2292]:

Submissions on Claim (all amounts are in $USD)	
Counsel fees	54,296,371
Expert/witnesses	28,489,929
Disbursements/expenses	16,469,424
Total	**99,255,724**
Submissions on Counterclaim	
Counsel fees	11,953,694
Expert/witnesses	3,726,955
Disbursements/expenses	1,216,359
Total	**16,897,008**
Tribunal Decisions with Reservation on Allocation of Cost	
Decision – Procedural Order No. 2	
Counsel fees	313,442
Disbursements	15,000
Total	**328,442**
Decision – Procedural Order No. 3	
Counsel fees	271,182
Disbursements	-
Total	**271,182**
ICC Administrative Costs	
Advance on cost of May 2016	147,000

[2289] Communication A 168.
[2290] Communications C-232 and R-219. Claimant initially submitted its Statement of Costs on December 20, 2021 (communication C-232); in January 2022, the ICC Court increased the advance on costs for both Parties; as a result, Claimant resubmitted its Statement of Costs, together with a correction of a minor error, on February 21, 2022 (Communication C-233).
[2291] Reficar's request for relief no. 58 under CPHB, para. 532.
[2292] Communication C-233.

Advance on cost of September 2016	175,000
Advance on cost of August 2018	702,500
Advance on cost of November 2018	702,500
Advance on cost of May 2021	897,500
Advance on cost of January 2022	775,000
Total	**3,399,500**
Document Production Phase	
Incurred in preparation of DPS and in defense of its DPS	1,233,397
Incurred in preparation of objections to counterparty's DPS	646,853
Total	**1,880,250**
Grand Total	**122,032,106**

2365. Therefore, Reficar requests an award on costs of USD 122,032,106.

2. RESPONDENTS' REQUEST

2366. CB&I has asked for a declaration that it is entitled to be awarded its legal fees, expert fees, and costs of this arbitration[2293].

2367. CB&I's Statement of Costs looks as follows:

Submission on Claim	
Legal Fees	67,847,277.19
Expert Fees	28,566,129.61
Disbursements/Expenses	6,235,709.10
Total	***102,649,115.90***
Submission on Counterclaim	
Legal Fees	21,969,859.90
Expert Fees	9,250,096.56
Disbursements/Expenses	2,019,206.39
Total	***33,239,162.85***
ICC Administrative Costs	
Payment of Initial Advance on Costs	325,000.00
Payment of Readjusted Advance on Costs	897,500.00
Payment of Further Readjusted Advance on Costs2	775,000.00
Total	***1,997,500.00***
Submissions on Tribunal Decisions with Reservations on Allocation of Costs	
Procedural Order No. 2	
Legal Fees	283,365.12
Subtotal	*283,365.12*
Procedural Order No. 3	

[2293] CB&I's request for relief no. hh. Under ESOD, para. 1612.

Legal Fees	569,390.43
Expert Fees	17,700.00
Subtotal	*587,090.43*
Total	***870,455.55***
Document Production Phase	
Costs incurred in relation to Respondents' DPS	246,902.15
Costs incurred in relation to Claimant's DPS	3,896,899.20
Total	***4,143,801.35***
GRAND TOTAL	***142,900,035.65***

2368. Therefore, CB&I requests a declaration that it is entitled to a total of USD 142,900,035.65 on legal fees, expert fees, and costs of this arbitration.

3. DISCUSSION

2369. In reaching its decision on the attribution of costs, the Tribunal will be guided by two provisions: the DRA (i.) and Art. 37 of the ICC Rules (ii.).

2370. (i.) Section 4.22 of DRA stipulates that[2294]:

> "The Arbitral Tribunal shall be empowered to award all or a portion of the costs of the arbitration, and arbitration fees, to either Party. Any Party unsuccessfully resisting enforcement of any Arbitration Award must pay the enforcing Party's cost of those proceedings".

2371. (ii.) Art. 37.5 of the ICC Rules confirms the Tribunal's discretion to make any decision it deems appropriate, at the same time suggesting that the Tribunal take into consideration the Parties' conduct during the proceedings:

> "5 In making decisions as to costs, the arbitral tribunal may take into account such circumstances as it considers relevant, including the extent to which each party has conducted the arbitration in an expeditious and cost-effective manner".

2372. Additionally, Art. 37(1) of the ICC Rules establishes that there are two main categories of Costs:

- The reasonable legal costs incurred by each Party in the furtherance of the arbitration ["**Legal Costs**"] (**3.1.**); under the Statement on Costs, these are reflected by the attorney and expert fees, and the expenses; and
- The fees and expenses of the arbitrators and the ICC administrative expenses fixed by the Court ["**Administrative Costs**"] (**3.2.**).

2373. The Tribunal will take separate decisions regarding these two categories and it will summarize its findings (**3.3.**).

[2294] JX-007, p. 13.

3.1. LEGAL COSTS

2374. The Tribunal will split its analysis into three categories: Claim (**A.**), Counterclaim (**B.**) and procedural decisions (**C.**).

A. Claim

2375. Reficar has been successful in its Claim and must, therefore, be reimbursed for the reasonable Legal Costs incurred in presenting its case.

2376. According to the Statement of Costs, Reficar spent USD 99,255,724 in Legal Costs relating to the Claim. The Tribunal finds that this amount is reasonable; this reasonableness is confirmed by the fact that CB&I spent a similar (slightly higher) amount in its defense against the Claim.

2377. The Tribunal must now decide what proportion of these reasonable costs should be borne by CB&I – the unsuccessful party. In reaching this decision, the Tribunal has considered that Reficar's case, in essence, dealt with the following issues:

- Pre-contractual liability claim, which, although not completely unmeritorious, the Tribunal finally decided against;
- Contractual liability claim, for breach of Cost and Schedule Control Commitments, which the Tribunal accepted, finding that CB&I had breached those contractual obligations with *culpa grave*;
- Quantum of the damages caused by said breach, which the Tribunal established at USD 1,008.41 million, which is approximately 25% of the amount claimed by Reficar.

2378. Allocating equal weight to each of the above issues and taking into account Claimant's relative success rate of 50% and 25% for the first and the last of them, and the full success of the second item, the Tribunal decides that, all in all, Reficar has been successful in, approximately, 58% (50% * 33.33% + 100% * 33.33% + 25% * 33.33%) of its claim.

2379. In light of the above, Reficar is entitled to the reimbursement of 58% of its reasonable Legal Costs arising out of the Claim, *i.e.*, USD 57,568,320.

B. Counterclaim

2380. CB&I filed a Counterclaim, in which it was partly successful, and must similarly be reimbursed for reasonable costs incurred.

2381. According to the Statement of Costs, CB&I spent USD 33,239,162.85 in Legal Costs. The Tribunal thinks that this amount should be adjusted downwards to reflect what, in its view, should be a reasonable amount. The Tribunal notes that Reficar has spent a significantly lower amount in its defense against the Counterclaim, USD 16,897,008. Taking this discrepancy into account, as well as the characteristics of the Counterclaim, the Tribunal finds that CB&I's Legal Costs should be brought down by, approximately, 33%. In the Tribunal's view, USD 22 million is an

acceptable quantification for CB&I's reasonable Legal Costs in bringing its Counterclaim.

2382. In determining what proportion of those reasonable costs should be disbursed by Reficar, the Tribunal has considered that the Counterclaim dealt with one major issue, which is the unpaid invoices (**a.**), and several other issues (**b.**).

a. Unpaid invoices

2383. CBI brought a Counterclaim of USD 48.6 million and COP 275 billion for unpaid invoices, but was ultimately only granted USD 914,939 and COP 28,256,049, which amount to, approximately, a 1% success rate.

2384. Taking into account the complexity and importance of this issue, the Tribunal decides to attribute 60% weight to it. The Tribunal will award 0.6% (60% * 1%) of CB&I's reasonable Legal Costs on account of the success of the unpaid invoices issue.

b. Other issues

2385. The Tribunal has also decided the following other issues:

- Improperly off-set amounts: this Counterclaim was dismissed by the Tribunal;

- Paid, but never approved invoices: this request had already been dealt with in the Tribunal's decision regarding the Claim;

- Drawing upon the Performance LoC: the Tribunal found that Reficar's drawing upon the Performance LoC had been correct, but acknowledged that said amount must be deducted from the amounts ordered to be paid to Reficar since Reficar had already collected; and

- Drawing upon the Advance Payment LoC: the Tribunal dismissed the declaratory relief requested by CB&I.

2386. The Tribunal decides to attribute a 50% success rate to CB&I for the decision on the unapproved invoices (these invoices were subject to the deduction of Excluded Costs) and the drawing of the Performance LoC (the amounts drawn down were deducted from the amounts ordered to be paid by CB&I) and 0% success rate to the other two issues.

2387. Taking into account the complexity and importance of each of these categories of Counterclaims, the Tribunal decides to assign a 10% weight to each of them.

2388. This brings CB&I's success rate on these four other issues to 10% ([0% * 10%] + [50% * 10%] + [50% * 10%] + [0% * 10%]).

* * *

2389. Summing up, considering the maximum reasonable defense costs incurred in arguing the Counterclaim of USD 22 million, the Tribunal finds that CB&I is entitled to a reimbursement of 10.6%[2295] thereof, *i.e.*, USD 2,332,000.

C. Procedural Decisions

2390. Three procedural decisions warrant a decision in a distinct section[2296]:

- Document production (**a.**); and
- PO No. 2 and PO No. 3 (**b.**).

a. Document production

2391. The Tribunal notes that Claimant spent USD 1,880,250 in the document production exercise and Respondents USD 4,143,801. In view of the characteristics of the case, given the number of the document production requests, the Tribunal, exercising the discretion it has when deciding on costs, is of the opinion that USD 1 million is the maximum reasonable amount for Legal Costs incurred in the document production exercise.

2392. As anticipated in PO No. 1, the Tribunal will allocate that amount to the Party that showed more efficiency during the document production exercise, taking into consideration the reasonableness of the requests and objections, the willingness to produce documents and the relative success of the requests made[2297].

2393. The Tribunal finds that Reficar has come closest to reaching efficiency, as it:

- Spent less than half the amount Respondents incurred and yet achieved a higher percentage of granted requests;
- Convinced the Tribunal that the counterparty's requests had to be rejected or narrowed down in a higher percentage than Respondents did; and
- Voluntarily produced a significantly higher number of requests than Respondents.

2394. For these reasons, the Tribunal decides that Claimant be awarded USD 1 million in Legal Costs incurred during the document production phase. The remainder of costs incurred by each Party shall not be reimbursed.

b. PO No. 2 and PO No. 3

2395. As explained in Section II.7 *supra*, PO No. 2 and PO No. 3 related to the admission of the Total Contested Documents from the *Contraloría* Proceedings. During this procedural incident, Reficar sent a letter to the *Contraloría* notifying it that Respondents had used documents obtained from the *Contraloría* Proceedings in this arbitration[2298]. At that stage of the proceedings, the Tribunal found that Reficar

[2295] 0.6%+10%=10.6%
[2296] PO No. 1, para. 65; Communication A 168.
[2297] PO No. 1, para. 66.
[2298] See para. 68 *supra*.

had breached the confidentiality regime of the arbitration by sending such notification[2299] and reserved its decision on costs for this incident until the Final Award[2300].

2396. The Tribunal considers that the reimbursement of reasonable Legal Costs incurred in defending this procedural incident is the appropriate remedy that should be granted to CB&I. According to the Statement on Costs, Respondents spent USD 283,365 in Legal Costs to address this incident; the Tribunal finds that this amount is reasonable, as Reficar spent a similar, if slightly higher, amount.

2397. Regarding PO No. 3, both Parties requested that the Tribunal order sanctions against the counterparty due to alleged improper procedural behaviour. As these specific allegations have not had any further development throughout the proceedings, the Tribunal does not consider that the Legal Costs arising out of PO No. 3 should be reimbursed to either Party.

2398. Thus, CB&I is entitled to USD 283,365 of its reasonable Legal Costs related to PO No. 2 and each Party should bear their own Legal Costs related to PO No. 3.

3.2. ADMINISTRATIVE COSTS

2399. As decided in the ICC Court's session of May 5, 2023, the Administrative Costs amount to USD 5,368,500[2301]. Claimant paid USD 3,382,655[2302] and Respondents USD 1,985,845[2303].

2400. The Tribunal finds that Reficar should be awarded a large portion of the Administrative Costs it paid: CB&I breached its Cost and Schedule Control Commitments with *culpa grave*, showing recklessness in the way it allowed costs and delay to grow. And, although the Tribunal ultimately decided that CB&I had not incurred pre-contractual liability, the Tribunal did acknowledge that CB&I's pre-contractual conduct was far from being commendable.

2401. Hence, the Tribunal finds that Reficar, undisputedly, had a lawful right to commence this arbitration and seek compensation for these breaches. The Tribunal also notes that Reficar's behaviour is not completely without reproach: it failed to pay approximately USD 1 million in invoices due and not all its claims for improper EPC costs have been successful.

2402. In view of this, the Tribunal decides that Reficar be compensated by CB&I for 80% of the Administrative Costs borne by Reficar, *i.e.*, USD 2,706,124. This means that the Administrative Costs are split in a proportion of, approximately, 12.6% for Reficar and 87.4% for CB&I.

3.3. CONCLUSION

[2299] PO No. 2, paras. 152-154.
[2300] PO No. 2, para. 154.
[2301] Case Financial Table compiled by the ICC, dated May 5, 2023.
[2302] USD 3,402,500 minus the reimbursed amount of USD 19,845.
[2303] USD 1,997,500 minus the reimbursed amount of USD 11,655.

2403. In conclusion, Reficar is entitled to reimbursement of the following costs:

- Reasonable Legal Costs in a total of USD 58,568,320, comprising USD 57,568,320 incurred in relation to the Claim, as well as USD 1 million incurred with regard to the document production phase; and

- Administrative Costs in the amount of USD 2,706,124.

2404. Accordingly, Reficar is awarded costs in the amount of USD 61,274,444.

2405. On the other hand, CB&I is also entitled to an award on costs of USD 2,615,365 (*i.e.*, reasonable Legal Costs of USD 2,332,000 incurred in relation to the Counterclaim, and USD 283,365 in relation to PO 2).

4. SET-OFF

2406. The Tribunal has found that both Parties owe each other an award on costs. Thus, it will set-off the amounts due by applying the same principles as those decided in Section VIII.2 *supra* on set-off.

2407. Applying these principles, Reficar's award on costs, in an amount of USD 61,274,444, should be deemed partially paid and settled through set-off, against CB&I's award on costs in an amount of USD 2,615,365, as also adjudicated in this section.

2408. In light of the above, CB&I UK, CB&I N.V. and CBI Colombiana[2304] must jointly and severally pay Reficar an award on costs in the amount of USD 58,659,079.

5. INTEREST

2409. As with set-off, interest on awarded costs will also fall under the same principles as those decided in Section VIII.3 *supra,* on interest. The only difference is that interest on awarded costs is to accrue from the date of the notification of this Award until the date on which payment of any amounts awarded has been carried out.

2410. Therefore, Respondents must pay Reficar interest on the costs awarded at the rate of six-month LIBOR (or the alternative rate, if LIBOR is discontinued[2305]) plus a margin of 2%, compounded daily, accruing from the date of the notification of this Award until the date of payment.

* * *

2411. In conclusion, the Tribunal decides that CB&I UK, CB&I N.V. and CBI Colombiana are ordered to pay jointly and severally to Reficar an award on costs of USD 58,659,079, plus interest at the rate of six-month LIBOR (or the alternative rate, if LIBOR is discontinued) plus a margin of 2%, compounded daily, accruing from the date of the notification of this Award until the date of payment.

[2304] Respondents are jointly and severally ordered to pay the award on costs considering the Tribunal's decision in Section VIII.2.4 *supra*.
[2305] See para. 2357 supra.

X. SUMMARY

2412. The Parties have presented long and exhaustive requests for relief in their submission, which are to be found in Section VI *supra*. In the next sub-sections, the Tribunal will provide a summary of the decisions adopted in this Award, by reference to the Blended Requests for Relief outlined in para. 299 *supra*. The Tribunal will devote individual sub-sections to

- Procedural decisions (**1.**),
- Precontractual liability (**2.**),
- Liability and quantum (**3.**),
- Joint and several liability, set-off and liquidation (**4.**),
- Interest and costs (**5.**), and
- Other claims (**6.**).

1. PROCEDURAL DECISIONS

2413. Reficar has asked the Tribunal to take three procedural decisions regarding the evidence of a witness who failed to appear at the Hearing, negative inferences from deficient document production and shifting of burden of proof[2306]. The Tribunal has taken the appropriate decisions in section III.2 *supra*.

2. PRECONTRACTUAL LIABILITY

2414. The Blended Request for Relief related to precontractual liability is the following[2307]:

> "*1. A declaration that CB&I committed pre-contract misconduct, breaching a pre-contractual duty to act in good faith and/or act with pre-contractual dolo and that CB&I is liable for damages*".

2415. The Tribunal's findings with respect to precontractual liability are the following:

2416. Reficar's case is that CB&I purposefully provided incorrect PFs (i.), July 2009 (ii.) and February 2010 (iii.) Estimates and April 2010 Schedule (iv.). The Tribunal, however, has found that[2308]:

- (i.) it was Reficar who had full knowledge of and requested the use of unrealistic PFs;

[2306] CPHB requests for relief no. 1 and 2.
[2307] CPHB requests for relief no. 3, 4, 5, 6, 7, 10, 23 and 24: RPHB, paras. 675.1 (Respondents' ESOD requests for relief no. 3 and 29) and 675.3(e).
[2308] See para. 653 *supra*.

- (ii.) the July 2009 Estimate did not adhere to the AACE Class 2 +/-10% accuracy level, but was not decisive for Reficar's decision to execute an RC contract;

- (iii.) the February 2010 Estimate did not meet the AACE Class 2 +/- 10% accuracy level, but Reficar was aware of this fact when it decided to execute an RC contract;

- (iv.) the April 2010 Schedule was not a Level 3 Schedule, but was acceptable to Reficar and, in any event, it was not decisive for Reficar's decision to execute an RC EPC Contract.

2417. As a matter of law, Reficar's case is that, by using deception and misrepresentation, CB&I induced Reficar to switch the EPC Contract from an LSTK to an RC methodology with liability caps. Reficar says that CB&I's misconduct resulted in *dolo* and in a breach of a pre-contractual duty to act in good faith.

2418. As regards the *dolo* claim, the Tribunal decided that[2309]:

- it was Reficar who, concerned about the volatile market conditions, took the initiative to change the EPC Contract from LSTK to RC;

- Reficar was aware that the February 2010 Estimate provided by CB&I was not an AACE Class 2 +/-10% estimate; similarly, it knew that the April 2010 Schedule was not a proper Level 3 resource-loaded schedule;

- Reficar did not rely on the Final Full Estimate when it consented to the RC EPC Contract, but on its own budget; similarly, it did not rely on the April 2010 Schedule, but accepted to agree to a Mechanical Completion Date and to receive the Level 3 resource-loaded schedule after the execution of the contract.

2419. The Tribunal also determined that Reficar took an informed decision to change to an RC EPC Contract, based on advice obtained from various expert sources; and that CB&I's input was not accepted lightly, but carefully reviewed by expert advisors engaged by Reficar.

2420. The Tribunal has further resolved that, even if it had found that CB&I's conduct amounted to *dolo* (*quod non*), Reficar still would have failed to provide a counter-factual scenario to establish damages[2310].

2421. As regards the claim for breach of good faith duties, the Tribunal acknowledged that, although CB&I's behaviour was not commendable, it was not the expression of bad faith or indicative of a breach of the good faith duties under Art. 863 of the Colombian Commercial Code[2311].

[2309] See para. 739 *supra*.
[2310] See para. 747 *supra*.
[2311] See para. 811 *supra*.

2422. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> *"1. Declares that CB&I did not commit pre-contract misconduct, did not breach its pre-contractual duty to act in good faith and did not act with pre-contractual dolo and is not liable for any damages under this heading".*

3. LIABILITY AND QUANTUM

2423. Both Parties have presented several claims based on the counterparty's breach of certain obligations. The Tribunal will first recall its previous decisions regarding CB&I's breaches (**3.1.**), then Reficar's breaches (**3.2.**). The Tribunal will then move to the question whether CB&I's breaches amounted to *dolo* or *culpa grave* and therefore, to the lifting of liability caps (**3.3.**). Finally, the Tribunal will address liabilities stemming from other proceedings (**3.4.**).

3.1. BREACH OF OBLIGATIONS BY CB&I

2424. The Tribunal has dismissed some claims based on the fact that they fall outside the Tribunal's power (**A.**). Claims adjudicated by the Tribunal power relate to the following contractual breaches: improper EPC Costs (**B.**), improper delay (**C.**), and work completion (**D.**).

A. Claims outside the Tribunal's power: indirect or consequential damages

2425. The Blended Request for Relief in this regard reads as follows[2312]:

> *"2. A declaration that the limitations in Section 4.13 of the DRA are enforceable".*

2426. The Tribunal has found that Section 4.13 of the DRA limits the Tribunal's authority to award indirect or consequential damages[2313]; thus, Reficar's claims for

- lost profits (request for relief no. 22),
- cost of capital on lost profits (request for relief no. 51) and
- indirect PCS-related costs (requests for relief no. 44, 47 and 48),

which all seek indirect damages, are outside the Tribunal's power and consequently are dismissed[2314].

2427. Request for relief no. 47 (make-good obligation of defective Work) includes a combined claim for indirect damages and for direct damages, and the Tribunal has found that the claim for indirect damages is outside the Tribunal's power[2315].

[2312] CPHB requests for relief no. 22, 44, 47, 48, 50 and 51: RPHB, para. 675.1 (Respondents' ESOD requests for relief no. 3 and 13).
[2313] See para. 2041 *supra*.
[2314] See para. 2076 *supra*.
[2315] See para. 2075 *supra*.

2428. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*2. Declares that the limitations as regards the Tribunal's powers, contained in Section 4.13 of the DRA are enforceable; as a result, the Tribunal lacks the power to adjudicate Reficar's requests for relief no. 22, 44, 48 and 51 and these requests are dismissed; request for relief no. 47 is partially dismissed for the same reason*".

B. Improper EPC Costs

2429. The Blended Request for Relief related to improper EPC Costs is the following[2316]:

> "*3. A declaration that CB&I must reimburse Reficar USD 1,945.96 million for costs paid by Reficar to CB&I, in performing work that were not reasonably and properly incurred in accordance with the EPC Contract*".

2430. The Tribunal has found that the EPC Contract is not a standard cost-reimbursable construction contract, because it includes specific, two-pronged Cost Control Commitments[2317]:

- CB&I's Heightened Diligence Obligation, which required CB&I to rigorously control cost and schedule, in a similar way to a lump sum contract, and to safeguard Reficar's resources as if its own;

- CB&I's Reasonable Cost Obligation, under which CB&I agreed only to claim reimbursement for costs that had been incurred reasonably, properly and in accordance with the Contract.

2431. The Tribunal found that, pursuant to TC 4 and TC 58.9, Reficar is entitled to claw back any amounts paid to CB&I, whenever CB&I has breached its Cost Control Commitments[2318] and that in the present case CB&I has indeed committed such breach[2319].

2432. In order to determine the magnitude of the breach, *i.e.*, to quantify the costs incurred in the construction of the Project that were unreasonable or improperly incurred, the Tribunal opted for a Bottom-Up methodology, which compares the actual EPC costs with an appropriate baseline (defined as the Reasonable Cost Benchmark)[2320]. The methodology implies the following steps:

2433. (i.) The starting point of the calculation is the actual amount paid by Reficar to CB&I, which is USD 5,908.2 million.

[2316] CPHB requests for relief no. 8, 14, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 53 and 56: RPHB, paras. 675.1 (Respondents' ESOD requests for relief no. 1, 3, 6, 7, 9, 14, 15 and 27) and 675.3(b).
[2317] See para. 866 *supra*.
[2318] See para. 918 *supra*.
[2319] See para. 942 *supra*.
[2320] See paras. 952 and 963 *supra*.

2434. (ii.) The second step of the calculation is the determination of the Reasonable Cost Benchmark, which the Tribunal set at USD 3,971 million.

2435. (iii.) Amounts paid in excess of the Reasonable Cost Benchmark constitute Excess Costs, which Reficar is in principle entitled to claw back; the Excess Costs are thus the difference between the total amount paid by Reficar (USD 5,908.2 million) minus the Reasonable Cost Benchmark (USD 3,971 million), *i.e.*, USD 1,937.2 million.

2436. (iv.) But the Tribunal also accepted that some of these Excess Costs were caused by factors outside CB&I's scope of control and needed to be excluded; these costs have been defined as Excluded Costs[2321].

2437. Excluded Costs amount to USD 1,091.20 million, broken down as follows:

- Costs caused by Unpredictable Events: USD 40.4 million[2322];
- Costs due to scope changes: USD 247.5 million[2323];
- Costs due to Claimant's Responsibility Events: USD 803.9 million[2324].

2438. (v.) The Excluded Costs must be deducted from the Excess Costs, resulting in an amount of USD 845.4 million; this is the amount that Reficar is entitled to claw back from CB&I as improper EPC Costs[2325].

2439. Reficar's additional claim for unsubstantiated advance payments, in an amount of USD 140 million, is already included in the previous analysis[2326].

2440. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*3. Declares that CB&I breached its Cost Control Commitments under the EPC Contract and must reimburse Reficar USD 845.4 million for costs paid by Reficar to CB&I, which had not been reasonably and properly incurred in accordance with the EPC Contract*".

C. Improper delay

2441. The Blended Request for Relief related to improper delay is the following[2327]:

> "*4. A declaration that Reficar is owed USD 366.25 million for liquidated damages for delay*".

2442. The Tribunal's findings with respect to improper delay are the following:

[2321] See para. 1015 *supra*.
[2322] See para. 1047 *supra*.
[2323] See para. 1080 *supra*.
[2324] See para. 1350 *supra*.
[2325] See para. 1354 *supra*.
[2326] See para. 1362 *supra*.
[2327] CPHB requests for relief no. 43, 44, 50, 51, 52 and 55; RPHB, para. 675.1 (Respondents' ESOD requests for relief no. 1, 3 and 18).

2443. The Tribunal found that the Guaranteed Mechanical Completion Date agreed by the Parties was February 28, 2013[2328] and that such date had not been amended[2329]. The Tribunal further determined that CB&I achieved Mechanical Completion of the Project when the final Certificate at Subsystem level was signed by Reficar, *i.e.*, on February 23, 2015[2330]. The delay of the Project was set at 725 days[2331]:

- Of these 725 days of delay, 203 occurred before the Cut-Off Date and are attributable to Reficar[2332].

- Of the 522 days of delay which occurred after the Cut-Off Date, 334 days are CB&I's responsibility and 188 days are Reficar's[2333].

2444. The prolongation costs in an amount of USD 157.1 million caused by these 188 days of delay attributable to Reficar have already been computed in the Excluded Costs and thus have been credited to CB&I[2334].

2445. The 334 days of delay caused by CB&I give rise to the application of Delay Liquidated Damages, as provided under TC 54.8, in a total amount of USD 152.75 million[2335].

2446. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*4. Declares that CB&I breached its Schedule Control Commitments under the EPC Contract and owes Reficar USD 152.75 million for delay liquidated damages*".

D. Work completion

2447. The Blended Request for Relief related to work completion costs is the following[2336]:

> "*5. A declaration that Reficar is owed USD 20,626,550 for specific impacts on PCS contractors, including the completion of outstanding and incomplete work and the correction of defective work*".

2448. The Tribunal's findings with respect to work completion costs are the following:

2449. The Tribunal has decided that, once CB&I had achieved Mechanical Completion, Reficar took the Project over and CB&I was no longer under the obligation to complete any pending Works[2337].

[2328] See para. 1558 *supra*.
[2329] See para. 1581 *supra*.
[2330] See para. 1624 *supra*.
[2331] See para. 1718 *supra*.
[2332] See para. 1718 *supra*.
[2333] See para. 1718 *supra*.
[2334] See para. 1348 *supra*.
[2335] See para. 1725 *supra*.
[2336] CPHB requests no. 45, 46 and 47; RPHB, para. 675.1 (Respondents' ESOD requests for relief no. 1 and 3).
[2337] See para. 1756 *supra*.

2450. The decision on correction of defective work, however, was different: CB&I was contractually obliged to correct defects and failed to properly comply with this commitment; thus, CB&I is obliged to pay to Reficar USD 10.3 million[2338] as compensation for the cost of the PCS contractors which carried out the reparations *in lieu* of CB&I[2339].

2451. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*5. Declares that CB&I breached its defects correction obligations under the EPC Contract and owes Reficar USD 10.3 million for specific impacts on PCS contractors*".

3.2. BREACH OF OBLIGATIONS BY RELICAR

2452. CB&I's counterclaim refers to Reficar's failure to pay invoices for cost incurred by CB&I (**A.**) and to Reficar's draw upon letters of credit (**B.**).

A. Unpaid invoices

2453. The Blended Request for Relief related to unpaid invoices is the following[2340]:

> "*6. A declaration that Reficar abused its rights and intentionally and/or maliciously breached its duties under the EPC Contract, and must reimburse CB&I for all reasonable and proper costs incurred until the EPC Contract is liquidated, in an amount of USD 146,964,022 and COP 568,695,037*".

2454. The Tribunal's findings with respect to unpaid (and off-set) invoices is the following:

2455. The Tribunal has decided that CB&I was entitled to payment from Reficar for invoices that complied with the requirements of the EPC Contract: costs had to be reasonable and proper, and invoices had to be correctly submitted and verified[2341].

2456. The Tribunal applied this approach to all invoices claimed by CB&I and decided that Reficar owed CB&I USD 914,939 and COP 28,256,049 for reasonable, proper and duly verified, but unpaid invoices[2342]; the Tribunal also concluded that there was no proof that Reficar had breached the Contract intentionally, maliciously, in an abuse of right or bad faith[2343].

2457. CB&I also claimed that the set-off performed by Reficar with regard to certain invoices had been improper and that the amounts set-off were still due, while Reficar denied the claim. The Tribunal dismissed CB&I's claim for lack of evidence[2344].

[2338] See para. 1834 *supra*.
[2339] See para. 1831 *supra*.
[2340] RPHB, paras. 675.1 (Respondents' ESOD requests for relief no. 1, 4, 8, 11, 26 and 31) and 675.1(a)
[2341] See para. 1373 *supra*.
[2342] See para. 1524 *supra*.
[2343] See para. 1465 *supra*.
[2344] See para. 1480 *supra*.

2458. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*6. Declares that Reficar breached its payment obligations under the EPC Contract and owes CB&I USD 914,939 and COP 28,256,049 for reasonable and proper costs* ".

* * *

2459. Reficar presented two requests for defensive reliefs against CB&I's counterclaim[2345]; given that the Tribunal has partially accepted the counterclaim, these defensive reliefs are already addressed in the relief regarding the counterclaim.

B. Draw-down of letters of credit

2460. The Blended Request for Relief related to the draw-down of letters of credit is the following[2346]:

> "*7. A declaration that Reficar properly drew on the Performance LoC and that amounts already collected must be credited to CB&I in the settlement of accounts; a declaration that Reficar is entitled to fully draw on the Advance Payment LoC, and that amounts drawn reduce the total amount that CB&I is ordered to pay by this Award*".

2461. The Tribunal's findings with respect to the draw-down on letters of credit is:

2462. Reficar's draw-down on the Performance LoC was proper: CB&I was in breach of its contractual obligations and the damage caused exceeded the amount of USD 70 million drawn down[2347]. Since the Performance LoC was drawn-down in full, CB&I no longer has any liability to Reficar under the Performance LoC[2348].

2463. As regards the Advance Payment LoC, the Tribunal has decided that it covered the total USD 5,908.2 million of invoiced costs paid by Reficar[2349]. Reficar was fully entitled to draw upon the Advance Payment LoC when it first attempted to do so – there is, thus, no evidence of a fraudulent conduct[2350] – and CB&I is still liable under the Advance Payment LoC[2351].

2464. If Reficar draws upon the Advance Payment LoC once this arbitration has finished, the amounts collected shall be deducted from CB&I's payment obligations as established in this Award[2352].

[2345] CPHB requests for relief no. 13 and 15.
[2346] CPHB requests for relief no. 16 and 17; RPHB, paras. 675.1 (Respondents' ESOD requests for relief no. 3, 4, 5, 20, 21, 22, 23, 24 and 25) and 675.3(d).
[2347] See para. 1488 *supra*.
[2348] See para. 1489 *supra*.
[2349] See para. 1519 *supra*.
[2350] See para. 1521 *supra*.
[2351] See para. 1519 *supra*.
[2352] See para. 1520 *supra*.

2465. In view of the above, the Tribunal's decision with regard to the Blended Requests for Relief is that it:

> "*7. Declares that Reficar properly drew on the Performance LoC and that amounts already collected must be credited to CB&I in the settlement of accounts; Reficar is entitled to fully draw on the Advance Payment LoC, and amounts drawn will reduce the total amount that CB&I is ordered to pay in this Award*".

3.3. LIMITATIONS OF LIABILITY

2466. The Blended Request for Relief related to limitations of liability is the following[2353]:

> "*8. A declaration that CB&I breached the EPC Contract during the execution phase through culpa grave or gross negligence and CB&I cannot avail itself of the limitation-of-liability provisions in the EPC Contract*".

2467. The Tribunal's findings with respect to the limitations of liability are the following:

2468. The Tribunal analysed CB&I breaches of the Cost and Schedule Control Commitments[2354]:

- The Cost and Schedule Control Commitments were all essential obligations;
- The breaches by CB&I were material and led to foreseeably significant damages;
- CB&I showed recklessness during the breach of its Cost and Schedule Commitments, taking no responsibility for the increases in costs and time and failing to take mitigating actions.

2469. As a result, the Tribunal found that CB&I acted with *culpa grave* when it breached the Cost and Schedule Control Commitments; thus, the liability caps under TCs 8 and 54 do not find application[2355].

2470. In view of the above, the Tribunal's decision on the Blended Request for Relief is that it:

> "*8. Declares that CB&I breached the EPC Contract Cost and Schedule Control Commitments through culpa grave or gross negligence and that CB&I cannot avail itself of the limitation-of-liability provisions in the EPC Contract with regard to the amounts awarded to Reficar in decisions 3. and 4. supra*".

3.4. INDEMNIFICATION COMMITMENTS

[2353] CPHB requests for relief no. 9, 10 and 12; RPHB, para. 675.1 (Respondents' ESOD requests for relief no. 3, 12, 18 and 28).
[2354] See Section VIII.1.2.4 *supra*.
[2355] See para. 2232 *supra*.

2471. The Blended Request for Relief related to the Indemnification Commitments is the following[2356]:

> "*9. A declaration that each Party owes the other or its Group members defense and indemnity for any judgment or decision by Colombian courts or any other governmental authority*".

2472. The Tribunal's findings with respect to the Indemnification Commitments are as follows:

2473. The Tribunal found that the breaching Party must comply with its Indemnification Commitments, to the extent that the breaches determined in this Award give rise to an Indemnifiable Event.

2474. In view of the above, the Tribunal's decision with regard to the Blended Request for Relief is that it:

> "*9. Orders both Parties to comply with their respective Indemnification Commitments under the EPC Contract, to the extent that the breaches determined in this Award trigger an Indemnifiable Event* ".

4. JOINT AND SEVERAL LIABILITY, SET-OFF AND LIQUIDATION

2475. The Tribunal will address each category of decisions separately.

2476. The Blended Requests for Relief related to the set-off, payment and liquidation of the EPC Contract are the following:

> "*10. A declaration that CB&I UK and CBI Colombiana are jointly and severally liable under any Project Agreement. A declaration that CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded pursuant to the Parent Guarantee*"[2357];
>
> "*11. A payment order for the amounts awarded*"[2358];
>
> "*12. A declaration that the Tribunal has Liquidated the EPC Agreement and established the appropriate EPC Agreement value*"[2359].

4.1. JOINT AND SEVERAL LIABILITY

2477. The Tribunal has found that CB&I UK, CBI Colombiana and CB&I N.V. are all jointly and severally liable under the EPC Contract with regard to the totality of amounts awarded in the present procedure[2360].

[2356] CPHB, requests for relief no. 18 and 19; RPHB, paras. 675(1) (Respondents' ESOD requests for relief no. 3, 16, 17, 32 and 33) and 675.3(c).
[2357] CPHB requests for relief no. 20 and 21; RPHB, paras. 675(1) (Respondents' ESOD request for relief no. 3) and 675.3(f).
[2358] CPHB request for relief no. 60; RPHB, paras. 675(1) (Respondents' ESOD request for relief no. 2).
[2359] CPHB, requests for relief no. 15, 43, 46, 47, 56 and 60; RPHB, paras. 675.1 (Respondents' ESOD requests for relief no. 2 and 26) and 675.3(g).
[2360] See para. 2314 *supra*.

4.2. SET-OFF

2478. The Tribunal has established that CB&I owes Reficar USD 1,008.41 million, which comprises[2361]:

- USD 845.4 million due to the breach of the Cost Control Commitments,
- USD 152.75 million due to the breach of the Schedule Control Commitments, and
- USD 10.3 million due to the breach of CB&I's obligation to provide the Works free of defects.

2479. Reficar, in turn, owes[2362]:

- To CB&I UK: USD 914,939 under the Offshore Contract, and
- To CBI Colombiana: COP 28,256,049 under the Onshore Contract,

for unpaid invoices.

2480. Both Parties have asked the Tribunal to perform a set-off of the amounts awarded and the Tribunal decided to do so as of the Liquidation Date, *i.e.*, December 31, 2015.

2481. Applying the set-off, Reficar's claim against CB&I UK in an amount of USD 1,008,410,000, are set-off against CB&I UK's counterclaim against Reficar in an amount of USD 914,939 resulting in a net credit held by Reficar against CB&I UK in an amount of USD 1,007,495,061. This amount must be reduced by USD 70 million already collected by Reficar under the Performance LoC[2363]. Thus, the amount in USD to which Reficar is entitled in accordance with this Award is USD 937,495,061[2364].

2482. Reficar must, however, pay the amounts awarded under the Offshore Contract to CBI Colombiana for unpaid invoices, in an amount of COP 28,256,049.

4.3. LIQUIDATION

2483. The Tribunal has decided to liquidate the Contract as of the Liquidation Date and has established the value of the EPC Agreement at USD 5,074 million plus COP 28.3 million[2365].

2484. In view of the above, the Tribunal's decision on the Blended Requests for Relief is that it:

> "*10. Declares that CB&I UK and CBI Colombiana are jointly and severally liable under any of the Project Agreements and that, pursuant to the Parent*

[2361] See para. 2078 *supra*.
[2362] See para. 1524 *supra*.
[2363] See para. 1528 *supra*.
[2364] 1,007,495,061-70,000,000= 937,495,061.
[2365] See para. 2324 *supra*.

Guarantee, CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded; as a result, Reficar may seek the relief awarded in this arbitration from all three Respondents: CB&I UK, CBI Colombiana and CB&I N.V., all of which are jointly and severally liable under the EPC Contract";

"*11. Orders (i) CB&I UK, CBI Colombiana and CB&I N.V. to pay jointly and severally to Reficar USD 937,495,061 and (ii) Reficar to pay COP 28,256,049 to CBI Colombiana* ";

"*12. Declares that the EPC Agreement, with a value of USD 5,074 million plus COP 28.3 million, is liquidated as of December 31, 2015*".

5. INTEREST AND COSTS

5.1. INTEREST

2485. The Blended Request for Relief related to interest is the following[2366]:

> "*13. An order for interest on the balance after liquidation and post-award interest until the date of payment of the award*".

2486. The Tribunal's findings with respect to interest are the following:

2487. CB&I UK, CBI Colombiana and CB&I N.V., which are jointly and severally liable, must pay Reficar interest on the amounts awarded and denominated in USD, at the rate of LIBOR for six-month deposits, plus a margin of 2%, compounded daily, with accrual starting as of December 31, 2015 and continuing until the date of actual payment of all outstanding amounts.

2488. Reficar, in turn, must pay CBI Colombiana interest on the amounts awarded in COB, at the rate of DTF, plus a margin of 2%, compounded daily, with accrual starting as of December 31, 2015 and continuing until the date of actual payment of all outstanding amounts.

2489. Should LIBOR cease to exist while interest is still accruing, SOFR should replace the LIBOR rate. Since the applicable LIBOR rate is the six-month rate, the SOFR replacement, if applicable, should also reflect the six-month rate of that benchmark.

2490. In view of the above, the Tribunal's decision on the Blended Request for Relief is that it:

> "*13. Orders (i) CB&I UK, CBI Colombiana and CB&I N.V. to pay jointly and severally to Reficar interest on the awarded amount of USD 937,495,061 at the rate of six-month LIBOR plus a margin of 2%, compounded daily, accruing from December 31, 2015 until the date of payment and (ii) Reficar to pay to CBI Colombiana interest on the awarded amount of COP*

[2366] CPHB requests for relief no. 49 and 59; RPHB, para. 675.1 (Respondents' ESOD requests for relief no. 3 and 35).

28,256,049, at the rate of DTF plus a margin of 2%, compounded daily, accruing from December 31, 2015 until the date of payment".

5.2. COSTS

2491. The Blended Request for Relief related to costs is[2367]:

"*14. An award on costs*".

2492. The Tribunal's findings with respect to costs are that both Parties were entitled to an award on costs:

- Reficar in the amount of USD 61,274,444; and
- CB&I in the amount of USD 2,615,365.

2493. Applying the same set-off principles as in Section VIII.2 *supra*, the Tribunal found that Reficar's award on costs should be deemed partially paid and settled through set-off, against CB&I's award on costs.

2494. Accordingly, Reficar is entitled to a reimbursement of its costs in the amount of USD 58,659,079.

2495. Finally, the Tribunal found that the award on costs should accrue interest in the same manner as any other awarder amounts, with the difference that interest on awarded costs is to accrue from the date of the notification of this Award until the date on which payment has been effectuated.

2496. In view of the above, the Tribunal's decision on the Blended Request for Relief is that it:

"*14. Orders CB&I UK, CB&I N.V. and CBI Colombiana to pay jointly and severally to Reficar an award on costs of USD 58,659,079, plus interest at the rate of six-month LIBOR plus a margin of 2%, compounded daily, accruing from the date of the notification of this Award until the date of payment*".

6. OTHER CLAIMS

2497. Both Parties have presented a number of additional requests for relief which the Tribunal needs not address, because of their subsidiary nature:

- Reficar's claim for breach of fiduciary duties[2368] and disgorgement of CB&I's profits and fees[2369] is only pleaded in the alternative, should the Tribunal dismiss the contractual breaches claim[2370], which it has not;
- Similarly, CB&I's counterclaim for unjust enrichment[2371] would only become relevant if the contractually available remedy did not provide adequate

[2367] CPHB request for relief no. 58; RPHB, para. 675.1 (Respondents' ESOD request for relief no. 34).
[2368] CPHB request for relief no. 11.
[2369] CPHB request for relief no. 54.
[2370] See para. 228 *supra*.
[2371] Respondents' ESOD request for relief no. 11.

compensation; but in this case, CB&I has successfully claimed payment of invoices due – there is, thus, no room for an additional claim for unjust enrichment[2372].

2498. The Tribunal also notes that CB&I presented two further requests for relief for additional compensation for fluctuations[2373] or unfair impact on CB&I's economic balance[2374], which are now moot given that the settlement of accounts does not render a result in CB&I's favour.

2499. Therefore, the Tribunal will now take a final decision which adjudicates all requests for relief which have not been dealt with in the preceding decisions[2375]; namely, it:

"*15. Dismisses any other claim, counterclaim or relief sought*".

[2372] See para. 1368 *supra*.
[2373] Respondents' ESOD requests for relief no. 36.
[2374] Respondents' ESOD requests for relief no. 37.
[2375] Among other, CPHB requests for relief no. 57 and 61 are covered by this decision. Similarly, Respondents' ESOD request for relief no. 30 is partially addressed in the Tribunal's adjudication of Reficar's Improper EPC Costs claim.

XI. DECISION

2500. For the reasons provided above, the Arbitral Tribunal decides as follows:

1. Declares that CB&I did not commit pre-contract misconduct, did not breach its pre-contractual duty to act in good faith and did not act with pre-contractual *dolo* and is not liable for any damages under this heading;

2. Declares that the limitations as regards the Tribunal's powers, contained in Section 4.13 of the DRA are enforceable; as a result, the Tribunal lacks the power to adjudicate Reficar's requests for relief no. 22, 44, 48 and 51 and these requests are dismissed; request for relief no. 47 is partially dismissed for the same reason;

3. Declares that CB&I breached its Cost Control Commitments under the EPC Contract and must reimburse Reficar USD 845.4 million for costs paid by Reficar to CB&I, which had not been reasonably and properly incurred in accordance with the EPC Contract;

4. Declares that CB&I breached its Schedule Control Commitments under the EPC Contract and owes Reficar USD 152.75 million for delay liquidated damages;

5. Declares that CB&I breached its defects correction obligations under the EPC Contract and owes Reficar USD 10.3 million for specific impacts on PCS contractors;

6. Declares that Reficar breached its payment obligations under the EPC Contract and owes CB&I USD 914,939 and COP 28,256,049 for reasonable and proper costs;

7. Declares that Reficar properly drew on the Performance LoC and that amounts already collected must be credited to CB&I in the settlement of accounts; Reficar is entitled to fully draw on the Advance Payment LoC, and amounts drawn will reduce the total amount that CB&I is ordered to pay in this Award;

8. Declares that CB&I breached the EPC Contract Cost and Schedule Control Commitments through *culpa grave* or gross negligence and that CB&I cannot avail itself of the limitation-of-liability provisions in the EPC Contract with regard to the amounts awarded to Reficar in decisions 3. and 4. *supra*;

9. Orders both Parties to comply with their respective Indemnification Commitments under the EPC Contract, to the extent that the breaches determined in this Award trigger an Indemnifiable Event;

10. Declares that CB&I UK and CBI Colombiana are jointly and severally liable under any of the Project Agreements and that, pursuant to the Parent Guarantee, CB&I N.V. is jointly and severally liable as a primary obligor for all obligations declared and amounts awarded; as a result, Reficar may seek the relief awarded in this arbitration from all three Respondents: CB&I UK,

CBI Colombiana and CB&I N.V., all of which are jointly and severally liable under the EPC Contract;

11. Orders (i) CB&I UK, CBI Colombiana and CB&I N.V. to pay jointly and severally to Reficar USD 937,495,061 and (ii) Reficar to pay COP 28,256,049 to CBI Colombiana;

12. Declares that the EPC Agreement, with a value of USD 5,074 million plus COP 28.3 million, is liquidated as of December 31, 2015;

13. Orders (i) CB&I UK, CBI Colombiana and CB&I N.V. to pay jointly and severally to Reficar interest on the awarded amount of USD 937,495,061 at the rate of six-month LIBOR plus a margin of 2%, compounded daily, accruing from December 31, 2015 until the date of payment and (ii) Reficar to pay to CBI Colombiana interest on the awarded amount of COP 28,256,049, at the rate of DTF plus a margin of 2%, compounded daily, accruing from December 31, 2015 until the date of payment;

14. Orders CB&I UK, CB&I N.V. and CBI Colombiana to pay jointly and severally to Reficar an award on costs of USD 58,659,079, plus interest at the rate of six-month LIBOR plus a margin of 2%, compounded daily, accruing from the date of the notification of this Award until the date of payment; and

15. Dismisses any other claim, counterclaim or relief sought by any Party.

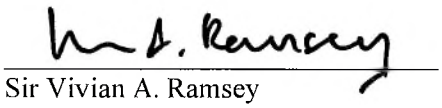
Place of arbitration: New York City, New York, U.S.A.

Date: June 2, 2023

THE ARBITRAL TRIBUNAL

Juan Fernández-Armesto
President of the Arbitral Tribunal

Andrés Jana Linetzky
Co-arbitrator



Sir Vivian A. Ramsey
Co-arbitrator