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Case No: CL-2018-000809

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION
COMMERCIAL COURT

Royal Courts of Justice
Strand, London, WC2A 2LL

Date: 26/04/2021

Before :

MR JUSTICE JACOBS

- -

Between :

CHENCO CHEMICAL ENGINEERING AND CONSULTING GMBH	**Claimant**
- and –	
DO FLUORIDE CHEMICALS CO. LTD	**Defendant**

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- -

Mr. Siddharth Dhar and Mr. Mubarak Waseem (instructed by **Bird & Bird LLP**) for the **Claimant**
Mr. Lin Wu for the **Defendant**

Hearing dates: 14 – 16 April 2021

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Approved Judgment

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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MR JUSTICE JACOBS

Mr Justice Jacobs :

Section A: Introduction

1. The Claimant in these proceedings ("Chenco") claims to be owed certain sums by the Defendant ("DFD") pursuant to the terms of a Final Award issued by a Swiss-seated ICC Arbitration Tribunal and dated 15 May 2013 ("the Award").

2. In the Award, the tribunal held that in breach of contract DFD had impermissibly used Chenco's proprietary technology (broadly speaking, its designs for the creation of an Aluminium Fluoride ("AlF_3") production plant) to construct four new plants for the production of AlF_3 at its facilities in Jiaozuo, China. Aluminium Fluoride is a chemical which is itself used in the production of aluminium.

3. As a result, the tribunal in the dispositive part of the Award ordered DFD to pay various sums. These included, in paragraph 414 of the Award, an order for payment of €100,000 per month in contractual liquidated damages to Chenco from 23 March 2011, and on the 23rd of each following month, for as long as it continued to use "Claimant's Technology," and with a backstop date of 31 August 2016. The expression Claimant's Technology was defined in paragraph 192 of the Award. In this judgment, I shall use the expression "Chenco's Technology" (which has at times been used in these proceedings) to describe the same thing.

4. Paragraph 417 of the Final Award obliged DFD to pay Chenco interest on the sums awarded under paragraph 414 "until the date of payment". Alongside the sums which DFD was ordered to pay, Chenco was ordered to pay certain monies to DFD as reimbursement of fees and expenses.

5. In December 2018, Chenco applied to the Commercial Court for permission to enforce the award pursuant to section 101 of the Arbitration Act 1996. That application was made, in accordance with the applicable rules in CPR 62.18, without notice to DFD. The evidence in support of that application, in the witness statement of Ms Sophie Eyre (a partner in the firm of Bird & Bird, Chenco's solicitors) was that no payment had been made in respect of the Award by DFD or anyone or any entity on its behalf. No recoveries had been made in any jurisdiction including in China, where enforcement proceedings had taken place and where in May 2017 the Chinese Court had granted permission to enforce some of the sums awarded under the Award.

6. Moulder J granted the application, giving DFD liberty to apply to vary or discharge the order. DFD so applied, and the matter then came before Sir Michael Burton GBE on 22 June 2020. At that time, DFD was represented by solicitors, Steptoe & Johnson UK LLP, and leading and junior counsel. The application to set Moulder J's order aside was made on a number of grounds. These included an argument that the question of whether DFD had continued to use Chenco's Technology required a further factual inquiry.

7. Sir Michael Burton considered that he was not in a position to decide the factual question of whether DFD had continued to use Chenco's Technology after the date of the Award. He therefore set aside the order of Moulder J, but granted judgment to Chenco in the sum of €2,903,255.53 which represented the balance of sums owed to Chenco in respect of the period up to 23 April 2013 after setting off the sums owed to

DFD under the Award. The order provided for judgment rate interest to accrue on the judgment debt of €2,903,255.53. Chenco says that this sum has not been paid, but it is not the subject of the present proceedings.

8. In relation to the period after 23 April 2013, the judge's order provided:

> "The extent to which any sums are owed to the Claimant for the period after 23 April 2013 pursuant to paragraph 414 and 417 of the Final Award is to be the subject of a further trial in the Commercial Court, pursuant to the directions attached at Schedule A".

9. During the course of argument at the hearing, the judge had referred to this further trial as an "enquiry". His directions in Schedule A provided for the service of pleadings, starting with DFD's Statement of Case, followed by standard disclosure by DFD and the sequential service of factual evidence. There was no requirement for disclosure by Chenco, since the critical question, concerning the use of Chenco's Technology, depended upon facts and circumstances at DFD's facilities, to which Chenco did not have access. The parties were granted permission to serve expert evidence, with directions for reports, a joint memorandum and responsive expert reports. The "enquiry of this matter" was ordered to be listed for a hearing with a time estimate of 3 days including pre-reading.

10. There was no appeal from any aspect of Sir Michael Burton's order.

11. The present trial was therefore to determine whether the Court should enforce paragraphs 414 and 417 of the Final Award for the period May 2013 to August 2016, which turns on whether DFD continued to use Chenco's Technology.

The course of the proceedings

12. In accordance with the directions in Schedule A, the parties served their respective pleadings. By the time of service of DFD's Statement of Case, Steptoe & Johnson had ceased to act. The proceedings have thereafter been conducted by Mr Lin Wu (known also as Allen Wu), who is the Vice General Manager of the Investment Department of DFD. In his first witness statement served on 21 December 2020, in relation to a disclosure application made by Chenco, Mr Wu described himself as having the day to day conduct of the litigation on behalf of DFD. It is apparent that he has been assisted in this work by external Chinese lawyers.

13. The reason for Chenco's disclosure application was the perceived inadequacy of the standard disclosure provided by DFD. The application came before Andrew Baker J on 29 January 2021. He made an order for further disclosure of various categories of documents, including for the disclosure of certain important documents (referred to by their designation by DFD in the proceedings as DFD 1-5.1 and YH1-14) "in their native CAD format, un-edited, and with original accompanying metadata". Further documents were subsequently disclosed pursuant to this order, including metadata. This material is significant in relation to the issues in the case, for reasons which will become apparent.

14. Chenco did not initially serve any statements from factual witnesses. However, it did adduce evidence from Professor Dr.-Ing. Matthias Kind, an expert in process engineering. He served two reports dated 22 March 2021 and 7 April 2021. DFD served three statements from Mr Yu Hehua, who has worked for DFD for some time and continues to do so. He is a professor level senior engineer, and now holds the post of director of the technology department, where he has responsibility for technology R&D, project construction and technical renovation. He was involved in certain work which DFD allege was carried out in 2013 subsequent to, and (on DFD's case) in response to, the tribunal's award. He was not an independent expert witness, and his statements did not contain the declarations required of expert witnesses in court proceedings. DFD described him as an "internal" expert. It was clear from his written and oral evidence that he had considerable technical knowledge relating to process engineering and the production of aluminium fluoride. He was, therefore, a witness who was giving factual evidence which necessarily encompassed technical matters.

15. Prior to the hearing, DFD applied pursuant to CPR 39.6 to be represented by Mr Wu at the trial. Chenco did not oppose that application, subject to being satisfied on a number of matters, in particular that Mr Wu's request for the assistance of an interpreter was carefully controlled and did not derail the timetable. I granted DFD's application, on the basis that Mr Wu would endeavour to address the court in English using the assistance of a Chinese interpreter if required. Mr Wu did so, and the hearing proceeded with reasonable expedition.

16. Both parties made opening statements. Chenco then called as a factual witness Ms Simona Peter, an associate with Bird & Bird. She had served a short witness statement on 12 April 2021 addressing a point raised in DFD's skeleton argument served prior to the hearing. Chenco also called Professor Kind. Both witnesses were briefly cross-examined by Mr Wu. DFD then called Mr Yu Hehua, and he was cross-examined by Mr Dhar. His evidence was given via an interpreter who performed his task well and efficiently. The parties then exchanged brief written closing arguments prior to oral closing arguments which were given on the third day of the hearing.

The issues

17. DFD's pleaded position is set out in its Statement of Claim dated 21 August 2020 and its Reply dated 23 October 2020. In summary it contends that:

    i) In June 2011, on the commencement of the Arbitration and in the face of uncertainty of the ultimate outcome of the Arbitration, DFD enhanced its efforts and investments on research and technical development work to upgrade its AlF_3 production technology. DFD defines this as "the R&D Work".

    ii) DFD conducted the R&D Work for the specific purpose of enabling it to get rid of Chenco's Technology, and therefore to avoid the potential adverse consequences of the arbitration.

    iii) Following the Award, and with the smooth progress of the R&D Work, DFD was able to stop using Chenco's Technology. The fruit of the R&D Work meant that DFD could use its own upgraded technology which would have the benefit of increasing production capacity whilst decreasing raw material

consumption. As a result, DFD stopped all four previous fluid-bed reactors by 16 July 2013 for dismantling, and thereby stopped "in its entirety the use of any Chenco's Technology to the extent described and prohibited by the Award". (I will explain the significance of the "fluid-bed reactors" in Section B below. Each plant had its own fluid-bed reactor. There were therefore 4 reactors in total, but there was no suggestion that there was any material difference in the design of each of them. When referring to the design, I will usually refer to the "reactor" in the singular).

iv) In August and September 2013, DFD dismantled Chenco's Technology from the site of two of its plants (the no.3 and no.4 plants), and installed its own new upgraded plants (referred to in the pleading as the "Two Newly Installed Plants") employing only its own technology. These were said to be newly upgraded plants with the core of new fluid-bed reactors employing "DFD's Upgraded Technology":

v) Thereafter, DFD never used the other two plants. These plants had previously used (on the findings in the Award) Chenco's Technology.

vi) DFD argues that as a result of these changes, DFD has not been using Chenco's Technology in its course of production of AlF_3 to any extent whatsoever.

18. DFD's case, as set out in paragraph 20 of its Statement of Case, was that the onus was on Chenco to establish that after June 2013 DFD continued its use of the technology which had been found in the Award to be in violation of Chenco's Technology. If, therefore, the court held that DFD had changed its technology by introducing the DFD Upgraded Technology after June 2013, and that the DFD Upgraded Technology in the two Newly Installed Plants had removed the Chenco exclusive technical elements and was substantially different from its previously used technology, then the application for recognition and enforcement of paragraphs 414 and 417 of the Final Award must fail.

19. In paragraph 22 of its Statement of Case, DFD focused on the tribunal's findings in paragraph 222 of the Award (which is set out in Section B below), where the tribunal had identified various features of the fluid-bed reactor and had said that DFD's design was "strikingly similar" to Chenco's design. Paragraph 23 of the Statement of Case then identified various changes which were made to the design of the fluid bed reactor which meant that "the Two Newly Installed Plants with DFD's Upgraded Technology should not be taken as using Chenco's Technology".

20. It is relevant to note that DFD's pleaded changes relate to the design of the fluid-bed reactor itself, and not to any other element of the Chenco-designed process. The evidence of Mr Yu at the hearing confirmed that the industrial process which surrounded the fluid-bed reactor itself remained materially unchanged, as was apparent from drawings which showed the overall process before and after the alleged changes to the fluid-bed reactor. DFD's case at trial was in substance that there was nothing confidential about the surrounding process, because all the relevant information was in the public domain.

21. The various changes were all said to have been implemented in or around September 2013. In its pleaded Reply, DFD said that all the four previous fluid-bed reactors had been dismantled by 16 July 2013, but DFD did not admit continuing to use Chenco's Technology until at least 16 July 2013. DFD's case was that after the changes had been made, two of the four plants had resumed operations. It was not suggested that, following resumption, these two plants ceased operating before 31 August 2016.

22. Chenco's pleaded position is set out in its Statement of Defence, dated 25 September 2020. Chenco disputes DFD's position on a "root and branch" basis, contending that it is implausible and incorrect that DFD conducted its own "R&D Work"; or that as a result of that alleged work it developed its own "Upgraded Technology" to replace Chenco's Technology; or that it actually dismantled Chenco's Technology and used its own "Upgraded Technology" in two of its plants. Even if DFD did upgrade its own plants, that did not remove Chenco's Technology. Accordingly, Chenco contended that DFD continued to use Chenco's Technology after the date of the Final Award and until the backstop date of 31 August 2016, such that it is entitled to a sum of €4m plus interest.

23. In its skeleton argument for the trial, Chenco identified the following four key issues for resolution:

> Issue 1: Did DFD in fact design its own "Upgraded Technology" for its own use in or around June 2013?
>
> Issue 2: If so, did DFD actually dismantle the facilities in two of its plants (the previous no.3 and no.4 plant), and install in their place its "DFD's Upgraded Technology", as is alleged, in the period between May 2013 and in or around September 2013?
>
> Issue 3: If so, did that mean that DFD was no longer using Chenco's Technology, in those two plants, or should DFD still be considered to have been doing so?
>
> Issue 4: Did DFD in fact continue to use the other two plants following the Final Award, which it contends were not used, but which it accepts still contained Chenco's Technology; and if so, for how long?

24. I considered that this was a fair summary of the issues ventilated in the pleadings and which were developed by the parties in their written and oral arguments. Issues 1 and 2 were closely related, and were therefore addressed by Chenco collectively. The expert evidence of Professor Kind was essentially directed to Issue 3. Issue 4 was very much a subsidiary issue, to which neither party directed the substance of their submissions.

25. In addition to these factual and technical issues, DFD raised a jurisdictional argument, which is addressed in Section C below. A number of further issues were raised in DFD's closing submissions, and these are addressed in Section E below.

Section B: The Award

26. In this section, I describe the Award in more detail and its significance in the context of the issues for resolution. Bracketed numbers refer to the paragraphs of the Award.

27. The tribunal described the heart of the substantive issues as involving the question of whether DFD had used Chenco's Technology to build additional AlF_3 plants without appropriate consideration from the Claimant (113). That gave rise to various questions including the identification of "Claimant's Technology" as protected by the contract between the parties ("the contract"). The tribunal addressed this question in Section IX of the Award, headed "Claimant's Technology".

28. The relevant contractual provision in that regard was Article 4.1 of Annex 2 of the contract (167). This provided:

> "[Respondent] undertakes not to make further use, directly or indirectly, of the designs, proprietary rights, Know-how, technical information, drawings, specifications, manufacturing techniques or manufacturing instructions supplied by [Claimant] or its distributor or in any way acquired from [Claimant] related to the Technology and Know-how, except for the purpose set forth in this Agreement during the term of this Agreement and for a post-contractual term of 10 years after its termination."

29. The tribunal said (168) that the wording showed that the parties intended a broad scope for the type of information that was protected under the contract, and that the relevant criterion to grant protection against further use is that the relevant information is not in the public domain (169). In considering whether information was in the public domain, the tribunal considered that it did not need to answer the question whether a "package approach" could be taken: ie an argument that "in the extreme, even an assembly of elements of technical information which are all in the public domain can be contractually protected by a clause such as the one found in Article 4.1 of the Annex 2 of the Contract, if the assembled technical information as such is not in the public domain" (170 -171).

30. Accordingly, the tribunal focused on those "technical features of C-110" where there was evidence before the tribunal that those features had been applied by DFD (171). The reference to C-110 was to the engineering package which had been given to DFD and which was relied upon by Chenco (139). For the purposes of this exercise, the tribunal focused on two particular drawings which DFD had submitted, known as R-123 and R-124 (172). It considered R-123 in conjunction with a more detailed DFD document known as C-46. R-123 was a "Process Flow Sheet", which showed both the reactor and some of the equipment that surrounded it, with arrows designating the flow of materials. Exhibit R-124 was the drawing showing the reactor design: the build-up and internals of the chemical reactor (176).

31. The tribunal then considered whether three documents, forming part of C-110, were in the public domain. One of these documents was a "P&I Flow Sheet". The tribunal held that these documents did contain features "as mentioned under para. (171) of this Final Award": in other words, features where there was evidence that they had been

applied by DFD. The tribunal then held that DFD had not met the burden of proof that the technical information contained in these documents was in the public domain. At paragraphs (182) – (183), the tribunal said:

> "(182) This burden of proof cannot be met only by just showing that a technical principle is known in the public domain. What matters is to show that a piece of specific technical information is in the public domain. Respondent has not met the burden of proof that pages 1-599 006A ("P&I Flow Sheet"), 0-599 014 ("Reactor OD 2600 Internals") and 4-599 014/015 ("Reactor OD 2600") of C-110 are in the public domain.
>
> (183) Such a proof cannot be replaced by allegations of circumstantial means of evidence such as, for example, an alleged lack of R&D facilities. It was not demonstrated that the specific technical information is in the public domain."

32. The tribunal's conclusion at the end of Section IX, in paragraph (192) was as follows:

> "(192) The Arbitral Tribunal accordingly finds that the content of the pages 1-599 014 ("P&I flow sheet"), 0-599 014 ("Reactor OD 2600 Internals") and 4-599 014/015 ("Reactor OD 2600") of C-110 is Claimant's technology ("Claimant's Technology")."

33. In Section X of the Award, headed "Violation of the Use Restriction", the tribunal then went on to consider the parties' arguments as to whether there had been a breach of Article 4.1 which contained DFD's obligation not to make further use, directly or indirectly, of Chenco's designs, know-how etc. In that regard, Chenco alleged that DFD had not developed its own AlF_3 technology. Chenco drew attention to various matters, including the "striking similarities" between DFD's flow sheet (Exhibit R-123) and Chenco's technology (194). Chenco therefore argued that there was no convincing evidence that a different AlF_3 plant was being operated by DFD (205). DFD argued that it had developed its own technology for its AlF_3 plants, and used a different fluid bed reactor and a different reaction process (207-8).

34. The tribunal accepted Chenco's case. I will quote in full the tribunal's reasoning in paragraphs (213) – (223) of the Award:

> "(213) In 2006 the contractual ALF3 plant was erected and commissioned according to Claimant's Technology. This plant was operated until (at least) 2010."
>
> (214) Respondent admitted that it later built four additional ALF3 plants at its site in Jiaozuo (one in 2007, one in 2009, and two in 2011).
>
> (215) Respondent claims that these additional plants are not copies of Claimant's plant. Rather, they were built by using

proprietary know-how developed by Respondent before entering into the Contract with Claimant in 2005.

(216) Respondent submitted three documents which describe the state of Respondent's technology before signing the contract with the Claimant.

- Document R-94 (dated December 2005) is a technical drawing of the concrete structure for housing two ALF3 plants.

- Document R-89 (dated March 2005) is a flow sheet of the core part of the process.

- Document R-138 (dated March 2005) is a technical drawing of the distribution plate with bubble caps at the feed gas entrance into the reactor.

(217) However, most characteristic features of Respondent's earlier technology were not used by Respondent in its later plants. These are, for instance, only two recycles of solid material from the cyclones into the reactor, rotating valves in these recycle lines, a static (not rotating) cooler for the ALF3 product, and bubble caps with cylinder-shaped, straight skirts. Obviously, this technology was abandoned by respondent after signing the contract with Claimant in December 2005.

(218) The four additional plants were built after two years of operation of Claimant's plant. The technology of the four additional plants is disclosed to the Arbitral Tribunal only with respect to flow sheet (R-123 dated November 2009) and reactor design (R-124 dated April 2012). Many technical details of the additional plants (e.g. design and dimensions of Venturi dryer, cyclones, off gas scrubbers, product cooler, etc.) remain unknown.

(219) The flow sheet R-123 is oversimplified as it does not show all essential features of Respondent's process. Nonetheless, together with the printout of the computer screens in the control room (C-46, pp. 11-14, see also CS-16 pp. 61-71) a clear evaluation of Respondent's new process is possible. In the central part (around the reactor) the process has striking similarities with Claimant's process (C-110, drawing 0-599 006A). This manifested by:

- Vaporous AHF feed to the reactor (via item EO301);

- Use of wet Al(OH)3 (via item LO302);

- Circulating fluidized bed reactor (item RO301)

- Three recycles of solid material from the cyclones into the reactor (item XO303-5);

- Cooling of the reaction product AlF3 in a rotating drum (item FO302);

- Temperature control of the reactor by hot air (via item CO302).

(220) Furthermore, there are many additional similarities with Claimant's design in the geometrical design of equipment and piping. The decisive criteria, however, are the specific design and the interaction of these features in the whole process.

(221) By contrast, the existing differences between the Respondent's and Claimant's processes are of minor importance. For instance, the provision of a fourth cyclone and a gravity settling chamber for dust separation from the off gas is due to the rather fine Al(OH)3 feed not forseen in the contract. The same holds for the use of a third scrubber for off gas purification.

(222) The heart of the process is the chemical reactor, which has the circulating fluidized bed. The relevant documents are R-124 (Respondent's drawing of the reactor) and Claimant's drawings in C-110. Of special importance are Claimant's drawings 0-599 014 (reactor lower part) and 1-599 015 (reactor upper part). A comparison of the two reactor designs reveals striking similarities of nearly all design details of the reactors.

- The same material was used (Inconel 600)

- The reactors have exactly the same diameter (2.6m) and approximately the same height (approx. 10m).

- All pipe connections of the reactors have the same positions and dimensions.

- Even the numbering (N1, N2, N3, etc) of the pipe connections is identical.

- The arrangement and shapes of the stiffening plates of the reactor head, of the pipe connections and of the support ring are identical.

- The same holds for the arrangement of the measuring devices (e.g. temperature, pressure).

- In both designs, the distribution plates for the feed gas entry consist of bubble caps. The bubble caps have exactly the same height (300 mm), the same clearance

(90 mm), and the same shape (cone-shaped, flared skirt of the caps).

- Respondent's bubble caps, however, have a smaller diameter characterized by the inner diameter of the chimneys (Respondent 4.83 cm, Claimant 7.366 cm). This difference is compensated by a different number of bubble caps on the distribution plate (Respondent 91, Claimant 37). In both cases, the total free area of the chimneys is virtually the same (Respondent 0.1667 m^2, Claimant 0.1577 m^2). This is important as the pressure drop of the gas, which is a significant operational parameter, is determined by the free area of the distribution plate.

- The design of the bubble caps in Respondent's additional plants differs significantly from Respondent's former design (R-138 dated March 2005), in particular in the height of the bubble caps (old 240 mm, new 300 mm) and in the shape of the caps (old cylinder-shaped, straight skirt; new cone-shaped, flared skirt).

(223) The only obvious difference of the two reactor designs is the provision of a sieve tray in the middle part of the Respondent's reactor. The advantages and disadvantages of the intermediate sieve tray are disputed by the parties. However, the Arbitral Tribunal comes to conclusion that the additional sieve tray is of minor importance for the function of the reactor. The holes in the sieve tray (10 mm diameter) are larger by a factor of 200 than the solid particles (approx. 0.05 mm diameter). Thus, the particles can be easily entrained by the gas and transported from the zone below the sieve tray into the zone above the sieve tray. The sieve tray is equipped with three down comers to enable a down flow of the solid particles from the upper zone into the lower zone of the fluidized bed. In both sections, the superficial velocity of the gas is higher by a factor of approximately 10 than the terminal velocity of the particles. Therefore, the characteristic features of a circulating fluidized bed are maintained in spite of the introduction of an intermediate sieve tray in Respondent's design."

35. Its conclusions were expressed in paragraphs (224) and (225) as follows:

"(224) Therefore, the Arbitral Tribunal comes to the conclusion that the four production lines of Respondent do use Claimant's Technology in the core section of the process, and, to a very high degree, in the specific design of the reactor.

(225) Therefore, the Arbitral Tribunal **finds** that Respondent was and is in violation of the use restriction."

36. The tribunal decided that a contractual provision requiring the payment of what it described as "monthly penalties" applied to a violation of the use restriction under Article 4.2 of Annex 2 of the contract (249). Accordingly, DFD were ordered to pay €100,000 per month starting on 23 March 2011 and continuing to 31 August 2016. This latter date was the 10th anniversary of the start-up of the plant, and the tribunal construed this as being the relevant date for the end of the 10 year period in which the monthly damages were payable. These sums so awarded were additional to an award of compensatory damages of €320,000.

37. The relevant clause relied upon by the tribunal was headed "liquidated damages". In its written closing DFD drew attention to the penal nature of this clause, and the fact that the tribunal had awarded compensatory damages as well. Any argument based upon these matters is in my view beside the point. The contract between the parties is governed by Swiss law. Although an initial challenge to the Award was made by DFD in Switzerland, that challenge was not pursued. I am therefore dealing with an award which is valid under Swiss law, and indeed in respect of which this court has already decided that Chenco is entitled to judgment in respect of some of the monies awarded pursuant to the liquidated damages or "monthly penalties" provision.

38. A number of aspects of the Award are of particular significance in relation to the arguments which have been advanced at trial.

39. First, the tribunal rejected DFD's case that the technical information in the three relevant documents, forming part of C-110, was in the public domain.

40. Secondly, it is clear from paragraphs 213 – 224 that the tribunal's decision, that there had been a violation of the "use restriction", concerned not only the reactor itself, but more generally the "central part" or "core section" of the process which surrounded the reactor. Thus, in paragraph 219, the tribunal identified various features of the "central part (around the reactor)" of the industrial process of DFD, and described these as having striking similarities with Chenco's process.

41. It is not necessary for me to describe that industrial process in detail. It suffices to say that the six features identified in paragraph 219 included the reactor – which is certainly a key feature of the industrial process – but also 5 other features of the central part of the process. Similarly, in paragraph 224, the tribunal referred to the "core section of the process" as well as the reactor itself. There is no difference in substance between the "central part (around the reactor)" referred to in paragraph 219, and the "core section of the process" referred to in paragraph 224. It is clear from the drawings shown to me at trial, and the expert evidence of Professor Kind, that there are certain aspects of the process which were closely connected to the reactor itself, and the chemical reaction which produced AlF_3, and other parts of the plant which could be regarded as more distant and were not therefore "central" or "core".

42. Thirdly, the effect of the Award is that DFD had breached its relevant contractual obligation in Article 4.1 in respect of the period up to the time when the Award was issued in May 2013. DFD's case was that it was entitled to do what it was doing, because (in substance) any relevant technical information was in the public domain and it had developed its own technology. That case was rejected by the tribunal, and Sir Michael Burton ordered enforcement of the monetary consequences of the

relevant breaches, as determined by the tribunal, in respect of the period up to the date of the Award.

43. Fourth, the tribunal obviously could not make any determination as to what the position was subsequent to the Award. That is a matter for determination at the trial which took place before me. However, the tribunal's findings in the Award, described above, remain relevant, important and indeed binding upon the parties. The present trial does not present DFD with an opportunity to relitigate issues which were determined, adversely to DFD, in the arbitration. Accordingly, since the tribunal determined that DFD was liable for breach in respect of the period from March 2011 onwards, and this court has ordered enforcement of the Award up to 23 April 2013, it necessarily follows that DFD will be liable for breach thereafter unless there was indeed some relevant change to its industrial process which meant that it was no longer using Chenco's Technology in respect of which the tribunal held that it was in breach.

Section C: Jurisdiction

44. DFD accepts that the court has jurisdiction to determine Issue 1 and Issue 2. However, DFD disputes the court's jurisdiction to determine Issue 3. DFD submits that the question of whether it is still using Chenco's Technology – in the light of the changes it says it has made to the reactor – does not fall within the scope of recognition and enforcement of the Award. DFD says that this question has to be determined in a fresh arbitral reference.

45. For the following reasons, I do not accept DFD's argument that the court does not have jurisdiction to determine issue 3.

46. First, the present factual enquiry arises out of an order made by the court following agreement by the parties on the terms of that order in the light of the hearing before Sir Michael Burton. Paragraph 3 of the order dated 22 June 2020 provides as follows:

> "3. The extent to which any sums are owed to the Claimant for the period after 23 April 2013 pursuant to paragraph 414 and 417 of the Final Award is to be the subject of a further trial in the Commercial Court, pursuant to the directions attached at Schedule A."

47. The directions for the trial ordered under paragraph 3, as set out in Schedule A, included a specific direction in paragraph 7 that:

> "The parties shall be permitted to serve expert evidence limited to one expert per party relating to the use of Chenco technology by DFD and by when DFD ceased all use of Chenco technology."

48. The order contains no qualification or reservations as to the court's jurisdiction to determine the issue identified in paragraph 3 of the order. There is therefore no basis for limiting, in any way, the court's jurisdiction to decide the relevant issue, or indeed the evidence and arguments that each party could adduce on the merits of the issue raised.

49. That conclusion is reinforced by paragraph 7 of Schedule A to the order. That paragraph entitled both parties to adduce expert evidence on the question of when DFD ceased all use of Chenco's Technology. Again, there is no qualification or limitation on the expert evidence which each party could adduce in support of its case on the question of when DFD ceased all use of Chenco's Technology, and no suggestion that some aspects of that issue were outside the scope of the trial or the court's jurisdiction. The determination of the point in time at which DFD ceased to use Chenco's Technology presupposes answering the question of whether DFD ceased to use Chenco's Technology at all.

50. Secondly, it is unsurprising that the order was made in those terms. The transcript of the hearing records, at various stages, exchanges between the judge and counsel as to how matters were to proceed. It is clear that, as reflected in the order, DFD ultimately accepted that the relevant issue was for the court to determine.

51. Thus, at the outset of the hearing, Sir Michael Burton raised the issue of whether DFD had continued to use Chenco's Technology post-2013 and how that was to be determined; whether by the court directing an issue, or sending the matter back to the arbitrators. At the outset, Mr Hughes QC for DFD, took the position that this question "should be sent back to the arbitrators": see page 2: lines 14-15 of the transcript. (References hereafter in brackets are to the pages and line numbers of the transcript). The judge then asked whether it would not be "more sensible to have it heard by the court as to whether there's been an unauthorised use": (3:1-2). He was clearly of the view that this was the sensible approach as can be seen from what he said later in the hearing (30:6-10), namely that it was:

> "much more sensible for the court to decide it than for a seven-year -old - - I don't even know if the arbitrators are still alive, but they won't have any memory of it, I don't suppose -- much more sensible for it to be decided by the Commercial Court"

52. Prior to that latter comment, the judge had invited the parties to discuss whether they might not agree to this approach:

> "I mean, I don't know whether there's any point, is there, in my giving an opportunity for you - - for you, Mr Dhar and Mr Hughes, to talk about the possibility of having a - - setting aside the order and having a hearing adjudicated by the court on whether you have made unauthorised use of the technology, and I'm quite happy to say since the award, but it seems to me inevitable that you're going to have to say since July 2013, when you made your changes … "

53. The parties agreed to discuss the proposal and Mr Hughes reported the progress as follows (27:7-17):

> "My Lord, thank you. We've had constructive discussions in part. We've then -- Mr Dhar and I and our respective solicitors have been discussing how to move forward, but we shall then need the opportunity to take proper instructions with our clients in Beijing. So that if I start and then Mr Dhar can follow.

> The parties have both agreed in principle that it would be a good idea to - - for the court to address the issue of post-award -- the post-award issue in relation to alleged unauthorised use in relation to the monthly penalty payments as your Lordship suggested."

54. During another break, Mr Hughes succeeded in taking instructions on the proposal. He reported as follows (31:2-8):

> "We've been having -- holding discussions with our clients over the lunch break.
>
> …
>
> They're in agreement to the – to your Lordship' s proposal that there be a further determination in the Commercial Court of the issue of future or post-award penalty payments …"

55. There followed discussion about the terms of a draft order which Mr Dhar for Chenco had drafted, and Mr Hughes indicated that there had not been sufficient time to get sensible instructions. The judge referred to Mr Hughes having received "general instructions", and allowed more time for him to consider with his clients the draft order and to come back with any alternative suggestions.

56. After a break, Mr Hughes thanked the judge for the extra time. He said that "the common ground is that both parties accept that the question of further sums under paragraphs 414 and 417 of the Award should be the subject of a further trial in the Commercial Court pursuant to the directions".

57. In the light of these exchanges which led to the order, DFD cannot in my view dispute the court's jurisdiction to decide all aspects of the issue identified in paragraph 3 of the court's order. The court's jurisdiction was very clearly accepted, and the case has proceeded on that basis. That conclusion is reinforced by paragraph 9.5 of DFD's Reply, which pleads:

> "… it is averred that whether, for the period after 23 April 2013 (pursuant to paragraphs (414) – (417) of the Final Award), there was any unauthorised use of Chenco's technology by DFD is a matter of fact before this Court. The Court shall adjudicate the matter afresh upon the parties' statements and evidence in these proceedings without being bound by any observation of the Tribunal …"

58. Thirdly and in any event, in *A v B* [2020] EWHC 2790 (Comm) Foxton J considered the proper approach to jurisdiction under section 66 of the 1996 Act in cases where the question is "whether conditions set out in the award have occurred or the provisions of the award have been affected by subsequent events" ([28]). The core of his reasoning on this point, as relevant for present purposes, is at [29] to [31]:

> "[29]. To the extent that an arbitration has resulted in a final award, the interface between court and arbitration proceedings

> is very different to that which arises in relation to a prospective or pending arbitration. Not only does a final award render the tribunal functus officio, but enforcement of the award is essentially a matter for national courts rather than arbitral tribunals, so much so that, at least under English law, the award itself gives rise to a cause of action enforceable in court, and the award can be turned into a judgment of the court or enforced as if it were. If an award is entered as a judgment, that generates another cause of action (an action on the judgment) which is itself capable of being sued upon in court. Disputes relating to attempts to enforce the award through national courts are matters for the relevant court, not a dispute to be referred to arbitration.
>
> [30]. As I have noted, an English arbitration award creates a new cause of action – the implied promise to enforce the award – which has long been recognised to give a claim which can be brought before the English court in an action on an award (Purslow v Baily (1704) 2 Ld Raym 1039; Hassneh Insurance Co of Israel v Mew [1993] 2 Lloyd's Rep 243; Associated Electric and Gas Insurance Services Ltd v European Reinsurance Co of Zurich [2003] 1 WLR 1041, [9]). Judgment in such actions is not limited to giving the relief set out in the award, but extends to awarding interest under s.35A of the Senior Courts Act 1981 (Coastal States Trading (UK) Ltd v Mebro Mineraloel-handelsgesellschaft GmbH [1986] 1 Lloyd's Rep 465). It has never, so far as I am aware, been suggested that such claims could be subject to a successful stay argument in favour of arbitration. Equally, it has long been recognised that, in trying an action on an award, it may be necessary for the court to resolve a dispute as to whether the award was settled or varied by subsequent agreement (Smith v Trowsdale (1854) 3 E & B 83).
>
> [31]. If that is the position when an action is brought on an award, what of the position when summary enforcement is sought under s.66? I can see no reason why the court is not able, if it is willing as a matter of discretion to do so, to resolve in the context of a contested s.66 application disputes of a type which might be raised as a defence to an action on an award. […]"

59. Foxton J's approach applies, in my view, equally to enforcement applications under section 101. The court therefore has jurisdiction to determine Issue 3, which concerns whether a condition in an award has occurred (in this case whether DFD has continued to make unauthorised use of Chenco's Technology), regardless of consent or submission by DFD.

60. Accordingly, I reject the jurisdiction arguments. In any event, in the light of my conclusion (below) that Chenco succeed on Issues 1 and 2, DFD's jurisdiction arguments (which are directed at Issue 3) do not assist them.

Section D: Issues 1 and 2

61. The essential question here is whether there were material changes to the reactor which were introduced by DFD. Did DFD in fact design its own "Upgraded Technology" for its own use in or around June 2013? If so, did DFD actually dismantle the facilities in two of its plants (the previous no.3 and no.4 plant), and install in their place its "Upgraded Technology", as is alleged, in the period between May 2013 and in or around September 2013? The focus here is upon the reactor, because DFD's case is that this was the only relevant part of Chenco's Technology where it could be said that DFD acted in breach of contract. Chenco disputes this proposition, on the basis of the tribunal's findings of breach in relation to aspects other than the reactor. But it is appropriate first to address the question of whether there were material changes to the reactor. If there were none, then DFD's case fails and it is not necessary to address issues 3 and 4.

62. There is here a factual dispute: Chenco says that DFD made no material changes, and DFD relies upon the evidence of Mr Yu that it did. Chenco says that Mr Yu's evidence should be rejected: it is unsupported by, and inconsistent with, relevant contemporaneous documents as well as the inherent probabilities.

63. In resolving this factual question, I apply the well-known guidance of Robert Goff LJ in *Armagas Ltd v Mundogas S.A. (The Ocean Frost),* [1985] 1 Lloyd's Rep. 1, [57]:

> "Speaking from my own experience, I have found it essential in cases of fraud, when considering the credibility of witnesses, always to test their veracity by reference to the objective facts proved independently of their testimony, in particular by reference to the documents in the case, and also to pay particular regard to their motives and to the overall probabilities. It is frequently very difficult to tell whether a witness is telling the truth or not; and where there is a conflict of evidence such as there was in the present case, reference to the objective facts and documents, to the witnesses' motives, and to the overall probabilities, can be of very great assistance to a Judge in ascertaining the truth."

64. Robert Goff LJ's judgment was described as the "classic statement" in *Simetra Global Assets Ltd. v Ikon Finance Ltd.* [2019] EWCA Civ 1413, where Males LJ said at [48]:

> "In this regard I would say something about the importance of contemporary documents as a means of getting at the truth, not only of what was going on, but also as to the motivation and state of mind of those concerned. That applies to documents passing between the parties, but with even greater force to a party's internal documents including emails and instant messaging. Those tend to be the documents where a witness's guard is down and their true thoughts are plain to see. Indeed, it has become a commonplace of judgments in commercial cases where there is often extensive disclosure to emphasise the importance of the contemporary documents. Although this cannot be regarded as a rule of law, those documents are

> generally regarded as far more reliable than the oral evidence of witnesses, still less their demeanour while giving evidence."

65. Before considering the detail of such limited contemporaneous documents as exist, there are three matters which in my view are relevant as far as the inherent probabilities are concerned. They all point away from the case which DFD seeks to advance.

66. First, DFD's case that, in response to the Award, it carried out significant modifications to its facilities, would be inherently probable if there was evidence that DFD were taking steps to comply with the Award in all, or at least other, significant respects. However, the evidence indicates that DFD has not taken any steps at all to comply with the Award in the nearly 8 years since it was published, and that this failure has continued notwithstanding the judgment that was entered following the June 2020 hearing before Sir Michael Burton. On the contrary, DFD has resisted enforcement of the Award in a number of jurisdictions, including at the June 2020 hearing itself. Mr Yu's evidence indicated that he, and indeed DFD, strongly disagreed with the Award. Indeed, some of the materials submitted by DFD for this hearing, including parts of the witness statements of Mr Yu, seek to rely upon factual or expert materials which were before the tribunal but which, as is apparent from its decision, the tribunal did not accept.

67. Mr Yu said in his evidence that, in June 2013, there was some urgency required on the part of DFD in order to implement the technical changes required by the Award. He said this in the context of seeking to explain certain oddities in the reactor drawing on which DFD relied. I shall return to those oddities in due course. In my view, however, it is inherently unlikely that a party will be taking urgent, or indeed any, steps to implement technical changes necessitated by an arbitration, where the evidence shows that that party is taking no other steps to pay monies awarded, but instead is taking all steps to resist enforcement.

68. Secondly, and to some extent related to the prior point, the effect of the tribunal's Award is that DFD committed, over a lengthy period of time, what can only be regarded as a serious breach of its obligations under the contract. Having been held to have breached its contract, DFD has taken no steps to pay the amounts due to Chenco. Moreover, even on DFD's best case, the only steps taken to make changes concern the reactor. Nothing has been done to change any parts of the process which surround the reactor. Instead, DFD argues that the only relevant protected technology involves the reactor itself, notwithstanding that (as described in Section B above) the tribunal's decision was to the contrary. In these circumstances, I regard it as inherently unlikely that DFD will have considered it necessary or even desirable to spend money in order to implement changes pursuant to an Award which, as is clear on the evidence, it simply does not accept.

69. Thirdly, the work required in order to implement necessary changes, even if only to the reactor itself, would not have been straightforward. Indeed, DFD's case in these proceedings is that the critical drawing, showing the proposed changes to the reactor, was so confidential that DFD would not give a copy to the contractor or contractors who were working on it. Instead, Mr Yu's evidence initially was that the contractor came to see the drawing at DFD's premises, although subsequently his evidence was that DFD's personnel would attend the contractor's premises with the drawing. Their

presence there was to ensure that the work was carried out properly. Professor Kind's evidence indicated that the reactor for the industrial process of making AlF_3 was a central part of a sophisticated system. The process involved fluidisation of solids, which involves intense heat and mass transfer between solids and gas. The fluidisation process involves an upstream of gas to make a solid behave as though it were a liquid. This is achieved by a sufficiently high gas flow velocity passing through a powderous solid which makes the powdered solid itself flow. A minimum gas velocity is needed for the process of fluidisation to start. A vigorous movement is favourable for heat and mass transfers between gas and solid as well as for mixing of the gas and the solid. Mr Yu in his evidence accepted that the process involved very, very hot gases, and that it was essential to avoid mixing the hydrogen fluoride gas with water.

70. In these circumstances, one would naturally expect any contract for a significant project involving the reactor to involve significant cost and to contain provisions designed to ensure that the contractor carried out the work properly and in accordance with an agreed standard. That is borne out by the documents relied upon by DFD in support of its case that the work was carried out. DFD produced photographs of a number of contracts. These included two contracts with a contractor – whose name was redacted but to whom DFD gave the designation HX. DFD was referred to as Party A in the contracts, and HX as Party B. The contracts related to the "Transformation of Main Body and Bed of Alloy Fluidized Bed" on "Technical Innovation Line" 1 and 2. The contractual price for each contract was just under RMB 2 million (being approximately US$ 300,000). The contracts contained detailed provisions concerning quality standards (Article 2) and acceptance (Article 5). These articles provided:

> "Article 2 Technical Standards (Quality Standards) and Training
>
> Technical standards of equipment (including quality requirements): Party B shall process in strict accordance with national standards, industry standards and drawings finally confirmed by the Parties to meet Part A's technical and operational requirements. Stainless steel is made of Baosteel or TISCO national standard plate, and all materials are provided with material certificates. Within 15 days after signing the contract, Party B shall provide the equipment outline dimension drawings, electrical conditions, equipment weight and basic conditions, among which the as-built drawings shall be a complete set of detailed electronic drawings and two sets of as-built blueprints for each unit. The equipment falling into the category of pressure vessels shall also be provided with pressure vessel qualification certificates, etc.
>
> Before manufacturing, Party B shall notify Party A on a site visit for material confirmation.
>
> Party B shall not limit or obstruct the use of any equipment by setting any operation password or implicitly creating any password for the equipment, or by installing any computer

program on the equipment (including but not limited to PRC (Program Route Control)).

During the operation of the equipment, for vulnerable non-standard parts, Party B shall keep the spare parts in Party A's warehouse.

Before delivery, it is required to pickle and passivate inside and outside of the equipment.

Article 5 Acceptance

1.Time of acceptance: the final acceptance shall be carried out after Party B's equipment is installed and debugged, but the final acceptance time shall in no case be later than the time when Party B should make the delivery; otherwise, it shall be deemed as delayed delivery by Party B;

2.Acceptance standards: include but not limited to technical agreements, design drawings, material certificates, equipment operation instructions, equipment certificates, installation and commissioning test reports and other relevant data for acceptance;

3.Acceptance: the acceptance is completed in three progressive stages, namely, preliminary acceptance stage, installation, commissioning and trial run stage, and final acceptance stage;

(1) Preliminary acceptance stage: Party B shall notify Party A in writing to before preliminary acceptance within three days after the arrival of the equipment. The preliminary acceptance period lasts for three days, including inspection of packaging, appearance, specifications, quantity and weight of the equipment and spare parts. Party A shall issue a preliminary acceptance certificate to Party B within 3 days after the preliminary acceptance, which, however, does not mean that the acceptance is completed, and the equipment accepted as qualified.

(2) Installation, commissioning and trial run stage: Party B shall carry out installation and commissioning of the equipment three days after the issuance of the preliminary acceptance certificate. The installation and commissioning process shall be supervised by Party A's personnel onsite. The trial run period shall last for at least three days. During the trial run period, Party B shall record the trial run data every day and sign it for confirmation by Party A.

Installation, commissioning and trial run means equipment power-on and material-carrying operation, which is conducted to show that those equipment are qualified in terms of

> stable equipment performance, capacity, production and compliance of standard, and compliance of all parameters and indicators with the requirements in technical agreement.
>
> (3) Final acceptance stage: Party B shall notify Party A in writing for final acceptance within three days after installation, commissioning and trial run. The final acceptance period lasts for fifteen days. However, before final acceptance, Party B shall deliver to Party A the original design drawings, material certificates (contracts for purchasing raw materials from a third party and VAT invoices, etc.), equipment certificates, operation instructions, operation guidance, etc., or copies (seals and signatures) approved by Party A, as well as installation, commissioning and trial run records, etc., as prerequisites for final acceptance. In the final acceptance, Party A will compare and test the equipment based on the technical agreement and the data mentioned above. Within three days after the final acceptance, Party A shall issue a final acceptance certificate to Party B, by which the equipment shall be deemed as qualified.
>
> If the equipment has hidden (inherent) quality defects or defects that are unlikely to be found in the final acceptance process, it will still be regarded as unqualified. Party A shall raise a written objection within three days after any flaw or defect is discovered, and Party B shall appoint professional technicians to the site to repair, replace or return the items within forty-eight hours, and all expenses arising therefrom shall be borne by Party B."

71. The contracts also provided, in Article 10, for any notices to be delivered and served by "Party A's entrusted person, Yu Hehua": ie Mr Yu, who gave evidence at the trial. Any notice served by any other person or by other means was not binding upon the parties.

72. Work of this kind would inevitably generate correspondence and documentation, including the drawings and blueprints referred to in the clauses quoted above. Indeed, these contracts in Article 12 specifically provided that they had two annexes, including in Annex II "Equipment Drawing". A remarkable feature of the present case is that there is no supporting documentation which relates to the performance of these contracts. The equipment drawings which were annexed to the two HX contracts have not been produced.

73. The same is true of another contract relied upon: a contract for RMB 4 million with an installation contractor designated as JG, and relating to equipment and pipeline demolition on 4 production lines, and related recovery and installation works. Annex 1 to this contract, referred to in Article 11, was "the technical requirements for equipment and pipeline installation". This Annex has not been produced. The text of this contract refers, for example, to work on pipelines. It is not, however, possible to understand exactly what was to be done, and what was actually done, on the basis of this text and without the Annex to the contract. The contracts with HX appear to be

potentially more relevant, since at least those do refer to the "transformation of main body and bed of alloy fluidized bed".

74. In my view, it should not have been difficult for DFD to prove the nature of any work that was carried out in 2013. If there was indeed a significant redesign of the reactor, then this should not be at all difficult to prove by the production of relevant contemporaneous materials. I do not accept that the passage of time, or changes to IT systems, or the fact (as Mr. Wu said in his opening oral submissions) that oral communication was easy in DFD's building, provide a satisfactory explanation for the remarkable absence of supporting documentation in this case. On the contrary, if it were indeed the case that DFD were concerned to implement changes consequent upon the Award, so as to avoid a significant continuing liability of €100,000 per month, it would have been regarded as essential to ensure that the changes were properly documented, with all important documents being retained, so as to be able to prove in due course that they had indeed been implemented. I would have expected photographs to be available, but none have been produced.

75. Nor do I accept that the absence of documentation contemplated by the contracts relied upon by DFD can be explained, as Mr Yu suggested, by the fact that DFD's contract procurement department was using standard form templates which did not reflect what was actually happening in practice. There are in fact differences between the two HX contracts and the JG contract, including in the description of the Annexes to those contracts. Even if, however, the contract procurement department was using a standard template, in my view that simply reflects the fact that if a company such as DFD contracts for a significant engineering project to its industrial process, and in particular to the reactor, it will naturally require, for its own protection and in order to ensure the integrity of its processes, the sort of provisions relating to documentation and acceptance that one sees in the contracts. As Mr Dhar submitted, when one is dealing with complicated industrial processes involving significant quantities of potentially hazardous material, it would be important to obtain and retain blueprints of the work that has been paid for.

76. Against this background, I turn to consider such contemporaneous documents as do exist. In short, however, I agree with Chenco's submission that there is no documentation which can properly be regarded as supporting DFD's case, and indeed that it is contradicted by some of the handful of documents that do exist.

May – July 2013: DFD Internal documentation and market announcements

77. The Award was notified to DFD by its Swiss lawyers, Schellenberg Wittmer, on 27 May 2013. The covering email from the partner at that firm identified the fact that the decision raised various issues and questions for DFD, including as regards its impact on DFD's future AlF_3 business. On 1 June 2013, DFD's board made a public stock exchange statement about the Award. The statement referred to the award of the monthly penalty of € 100,000 per month. It concluded by saying that the company would take "proper measurement to deal with the award and will disclose any major development on time". I was not referred to any subsequent announcements which identified any specific steps taken in relation to the Award.

78. On 11 June 2013, a meeting of DFD's Technical Committee took place. It was attended by a number of senior individuals, including Mr Yu. The brief minutes of the meeting record the following:

> "According to the company's anhydrous aluminium fluoride plants operation status and regarding to the technical improvement of anhydrous aluminium fluoride, the attendees have discussed and concluded as follows:
>
> 1. The company's anhydrous aluminium fluoride plants need to be technical upgraded and revamped.
>
> 2. Department of Technology have to submit the project proposal before 15 June and finalize the material sourcing, the project will be initial in July, and complete the modification of the existing four plants in September."

79. There was nothing in the minutes which indicated that the upgrade and revamp was a consequence of the Award, or what the nature of this upgrade and revamp was to be.

80. The minutes of the meeting required DFD's Department of Technology to submit a project proposal before 15 June 2013. Mr Yu said in evidence that the decision was made at that meeting to go ahead with the revamp. Mr Yu then drafted a "Project Proposal", and this was reviewed by DFD's deputy general manager (Yang Huachun) and approved by its general manager (Hou Hongjun). The Project Proposal had five short sections: I - Project Background: II – Undertaking Department; III – Main Content of the Project; IV- Schedule of the Project; V – Project assignment. The document stated:

> "I. Project Background
>
> 1. The market of aluminium fluoride was shrink, and the price was in the lower ebb.
>
> 2. The tube material of the Anhydrous Hydrofluoric Acid heater in the aluminium fluoride plants facing corrosion alarm, the reliability of the equipment getting low.
>
> 3. Hot gas, reaction and wet scrubbing system in the plants are due for maintenance.
>
> II. Undertaking Department
>
> Department of Technology
>
> III. Main Content of the Project
>
> 1. Replace the heat exchange tube of the Anhydrous Hydrofluoric Acid heater, increase the reliability of the equipment.

2. Check and maintain the hot gas and reaction system, including the equipment and tube for combustion chamber, fluid-bed and hot gas duct.

3. Clean and maintain of the wet scrubbing system, including the equipment and tube for venture, receiver and waste water tank.

4. Clean the site and surface of the equipment.

5. Process, safety and operation training to the relevant personnel.

IV. Schedule of the Project

1. 16 June to 15 July 2013, material sourcing for the project.

2. 16 July to 31 August 2013, replace the heat exchange tube of the Anhydrous Hydrofluoric Acid heater.

3. 16 July to 31 August 2013, training.

4. 16 July to 31 August 2013, check and maintain hot gas, reaction and off-gas wet scrubbing system. 5. 1 to 15 September 2013, clean the site and surface of the equipment.

V. Project assignment

Item No.	Description	Department	Manager	Remarks
1	Source of project material	Project Office	Yu Hehua	Cooperate with the Bid Invitation Office and the Supply Division
2	Replace the heat exchange tube	Project Office	Yu Hehua	Cooperate with the Department of Production
3	Check and maintain the hot gas and reaction system	Department of Production	Zhou Xiaoping	
4	Clean and maintain of the wet scrubbing system	Department of Production	Zhou Xiaoping	
5	Training	Department of Production	Zhou Xiaoping	
6	Clean the site and surface of the equipment	Department of Production	Zhou Xiaoping	

Department of Technology

June 2013

Drafted by: Yu Hebna (in hand writing)

Reviewed by: Yang Huachun (in hand writing)

Approved by: Hou Hongjun (in hand writing)"

81. This document is in my view inconsistent with DFD's current case. If the background to the proposal was the need to make important changes in light of the Award, then one would expect that important aspect of the background to have been referred to in the "Project Background" section. One would also expect all important proposed replacement equipment to be identified. Instead, the only specific item that is to be replaced is the heat exchange tube. Otherwise, the work envisaged was described, in various places in the document, as checking and maintenance work: see Section I, paragraph 3, Section III paragraphs 2 and 3, Section IV paragraph 4, and Section V under Item 3. Mr Yu accepted in his evidence that checking and maintenance of the hot gas and reaction system, including the fluid bed was "very different to what you are now saying". I did not consider that Mr Yu had any adequate explanation for why this document did not refer specifically the work that DFD now contends was to be carried out, but instead refers to checking and maintenance.

82. On 16 July 2013, DFD made a further market announcement. The first paragraph of the document recorded that DFD and all members of the board guarantee the truthfulness, accuracy and completeness of the information disclosure in the announcement, and that there were no false records, misleading statements or major omissions. The announcement recorded the following:

> "In view of the continued sluggishness of the aluminium fluoride market, after DFD's research, it was decided to focus on the technical upgrades of the aluminium fluoride production line. The aluminium fluoride production line will be shut down from 16 July 2013 to 15 September 2013. It is expected to reduce production by around 20,000 tons. According to the current market price of aluminium fluoride, the operating income will be reduced by about RMB I 00 million. Investors are advised to pay attention to the investment risk."

83. There was no reference in this announcement to the alleged project to re-design the reactor in light of the Award. Mr. Yu attempted to deal with this announcement in his first statement, where he accepted that the reason for the shut-down was given as the sluggishness of the aluminium fluoride market. He said that this was "intended to reduce the impact on the company's stock price". I do not see that this provides an answer to the point that the announcement did not refer to, or attribute the reason for the shutdown to, the need for DFD to carry out significant work in light of the Award. In so far as this passage in his witness statements suggests that there would have been an adverse reaction on the stock price if DFD had said that it was making changes in order to comply with the Award – a suggestion that Mr Yu also made, somewhat tentatively in his evidence – I agree with Mr Dhar that this makes no real sense. DFD had already told the market about the Award, and specifically the "monthly penalty", on 1 June 2013. The market was therefore aware of that aspect of the Award. In the

same 1 June 2013 announcement, DFD had said that it would "take proper measurement to deal with the award and will disclose any major development on time". There was therefore every reason, if DFD were indeed taking steps to re-design the reactor in order to comply with the Award and thereby avoid a significant further liability thereunder, to tell the market that this was being done.

84. Accordingly, I consider that there is nothing in these contemporaneous documents which provides support for DFD's case that the reactor was redesigned so as to remove Chenco's Technology, and that in fact those documents contradict it.

The contracts with contractors

85. DFD also relied, in support of its case, upon the contracts with the contractors. I do not consider that any conclusions, favourable to DFD, can be drawn from these documents. Those documents in my view raise many more questions than they answer. For reasons already given, the documents disclosed by DFD are not the full contractual documentation that comprises the contracts: the important annexes are missing. The contracts contemplate that, as would naturally be expected, drawings would be provided by the contractor both at the outset of performance under the contract, and after the work had been performed. For example, as is apparent from Article 2 of the HX contracts set out above, HX was required within 15 days after signing the contract to provide "the equipment outline dimension drawings, electrical conditions, equipment weight and basic conditions". The clause went on to provide that "among which the as-built drawings shall be a complete set of detailed electronic drawings and two sets of as-built blue prints for each unit". Such drawings, if they had been produced by DFD in these proceedings, would have shown what work was intended to be carried out, and what was carried out.

86. Mr Yu's evidence was that no drawings were provided by the contractors. Instead, there was a process whereby DFD sent personnel to the contractors and checked that the work was being carried out properly, in accordance with drawings which DFD had itself prepared. Mr Yu said in his evidence that the equipment supplier would sign a confidentiality contract and non-disclosure agreement and that afterwards "we are not going to allow them to take the drawings away. Instead, we invite them to come to DFD and to check and to see the drawings themselves and we have technical personnel to guide them along, how to manufacture the equipment". Later in his evidence, however, he said that DFD's technical personnel would take the drawings to the contractors or equipment manufacturers, but that they would not give the drawings to them. There was always "supervision when the drawings is presented to the contractor". He confirmed that the contractors themselves produced no drawings at all for their work on the reactors.

87. I regard that evidence as not only inconsistent with the terms of the contracts, but also as completely implausible. I do not see how major and expensive work on the fluid bed reactors could be carried out without the provision by DFD of its drawings or the provision by the contractor of its drawings. I cannot see how the contractor would be in a position to perform its work properly if (as Mr Yu's evidence suggested at first) they had to come to DFD's premises to see DFD's drawings, but were not allowed to take copies of those drawings. Nor do I see how DFD could satisfy itself that the necessary work had been done properly if it did not receive plans and later as built drawings from its contractor. In the present case, a solid documentary record of what

was done would have been important for the additional reason that, on DFD's case, it was carrying out this work in order to ensure that it ceased to use Chenco's Technology and thereby avoid a further liability for damages.

The reactor drawings

88. Significant focus at trial was directed towards a reactor design drawing which, on DFD's case, was prepared in June 2013 and was therefore relied upon as providing support for its case as to the redesign at that time. Chenco's case is that this document was not created until 23 July 2020. In his evidence, Mr Yu agreed that this was the key document which showed how DFD were going to accomplish the task which he had (on his evidence) been given, namely to come out with proposals on how to remove the similarity points.

89. There is a considerable history to this document, including its metadata.

90. In the run-up to the trial, DFD disclosed five different versions of this reactor design. In terms of the technical design, the documents are identical. There are, however, significant differences in terms of file format, metadata and other incidental characteristics.

91. Version (1) was disclosed on 13 November 2020, pursuant to the order for standard disclosure. The drawing was referred to as DFD1-5.1. It was a pdf version of what appears to be a computer-aided design or "CAD" format drawing of the reactor design. The document is mainly black and white, though it contains, in blue, translations of the Mandarin text. A number of measurements are also redacted, again using blue. On the bottom right-hand corner there is a signature of a Ms Jia, dated 17 June 2013, and a signature of Mr Yu, dated 20 June 2013. According to the evidence of Ms Sophie Eyre in support of Chenco's application for disclosure which was in due course heard by Andrew Baker J, the elements in blue were added by a user called "Woody". Those elements were added on 12 November 2020. The metadate state that the document was created and last edited on 12 November 2020. In the course of his closing submissions, Mr Wu told the court that he was "Woody" (as Mr Dhar had previously suggested in his cross-examination of Mr Yu).

92. Version (2) was disclosed together with Mr Yu's first witness statement, dated 11 December 2020. This document was designated by DFD as YH1-14. YH1-14 is also a pdf document and contains the same translations in blue as were also contained in DFD1-5.1. However, unlike DFD1-5.1, YH1-14 does not contain any redactions of measurements. Ms Jia and Mr Yu's signatures are present as in DFD1-5.1 The metadata state that the document was created on 12 August 2020 and last edited on 12 November 2020.

93. On 29 January 2021, Baker J ordered, upon an application by Chenco, that DFD disclose "DFD1-5.1 and YH1-14 in their native CAD format, un-edited, and with original accompanying metadata".

94. On 10 March 2021, DFD disclosed Version (3). This was a .dwg document (ie a CAD format file) served together with Mr Wu's second witness statement. Visually, the most distinguishing feature of this document is that it is in green, yellow and red. There are no signatures on the document. Importantly, the metadata give a creation

date of 23 July 2020 and a last modified date of 22 February 2021. Chenco's case is that 23 July 2020 was indeed the creation date of this drawing. DFD disputes this.

95. Together with Mr Yu's second witness statement, dated 22 March 2021, DFD disclosed Version (4). This was a photograph of a printout of the reactor design. On the photograph can be seen the signatures of Ms Jia and Mr Yu, as in DFD1-5.1 and YH1-14. The photograph was disclosed together with a package of photographs of other drawings, comprising 48 pages of photographs referred to as YH2-1. In his oral evidence, Mr Yu described YH2-1 as the final printed and approved package of documents.

96. At paragraph 12 of his second witness statement Mr Yu states as follows:

> "12. I would like to note, the original files disclosed in WL2-2 by 10 March 2021 contained working draft, the final confirmed drawing have been printed in hard copies, reviewed and signed by the designers and myself before been stored in archive. The photos collection of the final printed version of WL2-2 is hereby submitted as YH2-1. If there is any discrepancy between the paper signature file and the original WL2-2 file, YH2-1 shall prevail."

97. The final version (Version (5)) was disclosed on 9 April 2021, together with DFD's skeleton argument. This was a further .dwg document. According to the metadate, this document was created on 3 June 2013 and last edited on 15 June 2013. The metadata further state that the document was last saved by "woody".

98. The discrepancy between the metadate of the two .dwg documents was addressed in DFD's skeleton argument at paragraph 16:

> "16. Claimant repeatedly raised issue with the date of the Reactor Design and alleged that 'the native CAD file shows that the Alleged Reactor Design was first created by DFD on 23 July 2020 and not in June 2013'. This is absolutely wrong. Defendant has explained this issue in its previous submissions, which is summarized as follows: Document submission errors are inevitable, as the file research conducted between Mr. Wu Lin, Mr. Yu Henua and relevant DFD technical personnel, there were many procedure regarding the files encryption and decryption, zipping and unzipping, translation, submitting and storing. After claimant points out in its skeleton argument paragraph 106 to 119, Defendant realized the wrong version of metadata file with a creation dated 23 July 2020 was mistakenly disclosed within the package of WL2-2. Please notice that exhibit DFD1-5.1 (as well as YH1-14) in PDF format was not converted directly from CAD file, but a scanned copy of the hard copy drawing with the designer and Mr. Yu's signatures on it, the hard copy scanned date is 23 July 2020 to create the PDF file, and then was edited for adding the English translation by the way of comments on 12 November 2020 before disclosed on 13 November 2020. Anyhow, DFD have

> retrieved the correct version of the CAD file with the creation date 3 June 2013 for the Reactor Design".

99. Mr Dhar asked Mr Yu in cross-examination whether the explanation given in DFD's skeleton argument made sense. Mr Yu said that it did not:

> "Because according to your description, the steps taken, if you take a hard copy and make a scan to create a PDF file, that should not be able to change the date of a CAD file. At least to my knowledge, I don't think that will affect the date of a CAD file."

100. Mr Yu instead gave the following explanation of the discrepancy:

> "So, indeed, I was also aware of this mistake after a phone call with Mr Wu Lin and he told me why the date of creation was not the right date, so I went to verify with the relevant personnel to check what is wrong. So in July 2020, when the court order with regards to the change -- request first came out, I asked the technical personnel to send me the file so that I can compare the process design between DFD's technology and Chenco's technology, so the technical personnel send me a file. And when we have -- we were requested to disclose some documents and I submitted that file to Mr Wu Lin as our disclosure. So after I heard from Wu Lin that date of creation of that particular file was not the correct date, I went to check with the technical personnel who sent me the file back in July 2020 and I got the answer that he was afraid that I might mistakenly did some changes because I want to make dimensions or I want to measure on the CAD file, so he sent me a copy of the original CAD file. So he created a copy of the original CAD file on the date of the 23 July 2020 and he sent that copied CAD file to me. In the end, I told him to retrieve the original file and send it to me and he did so and I forwarded the original CAD file to Mr Allen Wu."

101. For the following reasons, I consider that the relevant drawing was indeed created in July 2020, as the metadata in Version (3) indicates. I do not accept DFD's case that the relevant design dates from June 2013.

102. The starting point to my mind is the metadata on Version (3) itself. This document was disclosed pursuant to an order made by Andrew Baker J upon Chenco's detailed application for further disclosure. The application made by Chenco was, as DFD must have appreciated, an important one. Ms Eyre in her witness statement had explained in some detail the significance of the documentation that, on behalf of Chenco, she was seeking. In her 4th witness statement, dated 10 December 2020, Ms Eyre referred to serious failures in disclosure that needed to be rectified. These included specifically the absence of metadata, which meant that it was "impossible to properly consider the authenticity of the documents". She referred in that connection to document DFD 1-5.1. Metadata was an issue which had been raised in correspondence, and DFD had indicated that it would respond to DFD's complaints by the week commencing 30

November 2020 but had not done so. Andrew Baker J then made his order on 29 January 2021, with an order for production by 5 February 2021. In the event, disclosure was not given until early March 2021.

103. Against this background, it is reasonable to conclude that DFD would take care in producing documents responsive to the order of the court. If, as is now suggested, it is said that there was some explicable error in the metadata of an important document so produced, then I consider that good evidence would need to be given as to exactly what happened. Instead, DFD gave an untenable explanation in its skeleton argument served only days before the hearing: an explanation which Mr Yu could not support. It then gave a completely different explanation in the course of Mr Yu's evidence. That evidence was not based on any personal knowledge that he possessed, but upon what he was told by other people. Neither the original nor the subsequent explanation was supported by any expert evidence. Where DFD within the space of a few days has given two different explanations as to why the metadata showed a July 2020 date, I see no reason why I should accept either of them in preference to the evidence of the metadata itself.

104. In my view, there is therefore nothing to outweigh the evidence as to the date of creation of the drawing as shown by the metadata accompanying Version (3) which was produced in response to Andrew Baker J's order.

105. DFD, in its skeleton argument for trial, relied upon evidence of different metadata, accompanying Version (5), which apparently confirmed the June 2013 dates of creation. Chenco responded to this evidence by calling Ms Simona Peter. The thrust of that evidence, which was not substantially challenged, is that it is relatively easy to manipulate metadata in order to produce a desired result. This can be done by changing the date on the computer clock. I accept that evidence, which is consistent with my own experience in other cases where this issue has arisen. I therefore place no reliance on the metadata produced on 9 April 2021.

106. There is also other evidence, described below, which supports the conclusion that the relevant drawing was not created in June 2013.

107. Chenco was able to point to two significant oddities in the pdf and photographic copies (ie non CAD) of the relevant design drawing. As discussed above, Mr Yu's evidence was that the documents in YH2-1 comprised the final printed and approved package of documents. Within that package was the reactor design drawing. However, there were two important differences between that document and the remainder of the package. First, the reactor design drawing did not have the standard DFD confidentiality warning that appears on all the other documents. Secondly, the other drawings contain a DFD project number.

108. When asked about this, Mr Yu's said that the reactor drawing was a special case. It was produced with great urgency, and an error had been made in failing to spot that it did not have a project number or the warning. He said that because of the urgency, the staff responsible did not have time to add the warnings and the numbers. I found this explanation unconvincing and implausible. It does not take very long to add a project number or warning. One would expect to see both in an important document such as the drawing for the redesign of the reactor; particularly the confidentiality warning if, as Mr Yu maintained, the project was so sensitive that drawings would not even be

given to the contractor. Nor, for reasons already given, do I accept that DFD were approaching matters on the basis that the Award needed to be complied with as a matter of urgency: I have already referred to DFD's unwillingness to comply with other aspects of the Award. Indeed, even on DFD's case, Mr Yu had three days to review the document: it was finalised by Ms Jia on 17 June but only signed off by Mr Yu on 20 June.

109. I agree with Mr Dhar that the likely reason for the omission of these details is that the relevant document was drawn up out of context long after the event, and the omission of the confidentiality warning and project number is the sort of error that might well be made in that process.

110. In addition, Version (5) of the design document, apparently supported by metadata, itself has oddities. This was the version served on 9 April 2021. The metadata shows, however, that this document was last saved by Woody. Mr Wu accepted that he was Woody. I do not consider that there was any valid or convincing reason as to why the metadata should record Mr Wu as being the last person to save the document, given that there is no evidence that he had any involvement in the project in 2013. Furthermore, Mr Wu's evidence in his second witness statement was that the relevant electronic files came from Mr Yu alone. Mr Wu in his oral closing submission sought to explain why the name Woody appeared, suggesting that it was because he had been using certain decryption software. Again, that explanation was unsupported by any expert evidence, and it was not even supported by Mr Yu. When he was asked about why the name Woody appeared on the relevant document, he said that he did not know what "happened to this particular screenshot or what resulted it".

111. For these reasons, I do not consider that any credence can be attached to the design drawing allegedly dated June 2013. I consider that this was indeed created in July 2020. That would, as Chenco submitted, be consistent with the developments in the present litigation which I will now describe.

112. The relevant litigation background in this context is as follows. Prior to the hearing in June 2020 before Sir Michael Burton, there is no evidence that DFD had referred to or relied upon or disclosed in the context of any enforcement proceedings, this specific design drawing. One of DFD's grounds for challenging Moulder J's order was that the Final Award could not be enforced and/or was not binding because, as set out in DFD's application notice, it required a further factual determination of DFD's use of Chenco's Technology, "which determination has not yet taken place". In his witness statement in support of the application, Mr. Raynes on behalf of DFD referred in paragraph 17 of his statement to his instructions that "due to issues with Chenco's Technology, DFD made a number of technical adjustments". He said that these were reflected in the minutes of the meeting dated 15 June 2013 and the corporate announcement made on 16 July 2013. Both of these documents were exhibited. His conclusion was that the shutdown of the fluoride production line referred to in the 16 July corporate announcement necessitated "a factual enquiry as to whether, after this date, DFD was using Chenco's Technology".

113. In her second witness statement in response to DFD's application to set aside, served on 19 February 2020, Ms Eyre said that "DFD has not asserted a positive case" in respect of whether DFD had stopped using Chenco's Technology. (This point was further developed in paragraphs 100 – 101 of Chenco's skeleton argument for the

hearing). Mr. Raynes responded to that witness statement on 8 May 2020. Despite the issue raised by Chenco as to the absence of a positive case, the only contemporaneous evidence disclosed in this context by DFD were the June 2013 Minutes and the July 2013 Announcement. At the hearing before Sir Michael Burton, DFD also referred to submissions made to the Chinese court in its application to resist enforcement of the Award in China. In those submissions DFD had said that "DFD's technology used in the new production lines has continuously been upgraded and revamped every year, especially the drawings and process used after July 2013 were totally different from the drawings and process submitted in the arbitration proceedings". None of these submissions, however, referred to or disclosed the new reactor design, even though (as Mr Yu said), this was a key document.

114. The upshot of the hearing before Sir Michael Burton was that the present trial was ordered. Mr Dhar submitted that the July 2020 metadata shown by Version (3) fits into the chronology. He said that the effect of Sir Michael Burton's order in June 2020 was that there was to be a factual investigation into the question of whether there was a redesign. DFD's case to that effect could not realistically be based only upon the June 2013 Minutes and the July 2013 announcement. Something more concrete was required. This led to the creation of the design drawing in July 2020, not long after Sir Michael Burton's order, as part of DFD doing whatever was necessary to resist paying any money to Chenco. In my view, that submission was convincing and I accept it.

115. In his oral closing submissions, Mr Wu emphasised that DFD's case had always been based upon the proposition that there had been a relevant update to the technology. He referred specifically to the evidence of Mr Xing Xiusong which was submitted in the context of the application to set aside the order for enforcement. In paragraph 15 of his second witness statement, Mr Xing referred to DFD's submission in enforcement proceedings in China where DFD had submitted that it had used its own technology in its new production lines. That passage was, as I have said, read to Sir Michael Burton during the hearing. However, I do not consider that this meets the significant point of the argument; namely that despite the assertions that new technology had been introduced, the important reactor drawing was never produced until after the hearing before Sir Michael Burton.

116. It follows for all these reasons that I do not accept Mr Yu's evidence, and DFD's case, that there was a significant redesign of the reactor in 2013, and that DFD thereafter ceased to use Chenco's Technology in its reactors. Mr Yu's evidence was implausible in various respects described above, and in my view is not consistent with the contemporaneous documents. I consider that such work as was carried out on the reactors was the checking and maintenance work, together with the replacement of the heat exchanger, described in the "Project Proposal" document drafted by Mr Yu.

117. I therefore conclude, on that basis, that Chenco is entitled to enforce paragraph 414 of the Award in full. The resulting sum payable is € 4 million. Chenco is also entitled to default interest, pursuant to paragraph 417 of the Award. Chenco calculated such interest to be € 1,143,091.90 as at 25 September 2020. An updated calculation should be provided by Chenco for the purposes of the order to be made pursuant to this judgment, and any issues arising on the interest calculation can be addressed in writing or at a "consequentials" hearing.

Section E: The remaining issues

Issue 3

118. My conclusions on Issues 1 and 2 are sufficient to decide the present case in favour of Chenco. However, I also so decide because I accept Chenco's argument on Issue 3. The question here is whether, even assuming in DFD's favour that it did redesign the reactor, did that mean that DFD was no longer using Chenco's Technology in the two plants that (on DFD's case) continued to operate.

119. I can deal with this question relatively briefly, in the light of (i) the findings of the tribunal in its Award; (ii) the absence of any case on the part of DFD that any material work was carried out other than on the reactors themselves; and (iii) the evidence of Professor Kind which in my view was given independently and with clarity and authority, and which was not matched by any equivalent, or indeed any, independent expert evidence called by DFD.

120. The starting point is the Award itself. As discussed in Section B above paragraphs [38 - 43], there are a number of aspects of the Award which are of significance, particularly in the context of Issue 3. As it is clear from paragraphs 213 – 224, the tribunal's decision, that there had been a violation of "use restriction" concerned not only the reactor itself, but more generally the "central part" or "core section" of the process which surrounded the reactor. I have already set out the features identified by the tribunal in paragraph 219 of the Award which comprised that central or core section.

121. Professor Kind in his oral evidence told me that the reactor was the central feature of the system, but that it could not be divorced from everything that was around. He said:

> "So it's always the entire process and how you operate it and I would say the technology is the entire bundle consisting of the process flow diagram with the reactor in the centre but also the cyclones around it and so on and how to feed, for instance, the hydrogen fluoride as a gas which has to be evaporated before. And then one very important aspect is you have to fluidise the material in the bed, therefore you need some gas and you need a temperature in the bed, therefore you need the combustion chamber and you have to heat this up before starting the feeding of the HF, yes.
> …
> You want to have – somewhere must be the reactor and that is always in the core. The other parts are to prepare the reactants for the reactor, and others, other sections of the plant are to separate the product from the residuals, from the byproducts, from the auxiliary materials and so on and then get it out and it's exactly what we have here, yes"

122. This was the approach of the tribunal in the Award. The six features identified in paragraph 219 of the Award included but were not confined to the reactor itself. The Award identifies 5 other features of the central part of the process. The tribunal held that DFD was in breach of its obligation in Article 4.1. The tribunal rejected DFD's case that it was entitled to do what it was doing, because (in substance) any relevant technical information was in the public domain. The tribunal's decision, that there was a breach of contract, was not based only upon DFD's use of Chenco's

Technology in the reactor, but more generally in the core process which surrounded the reactor.

123. I now turn to the question of what DFD has actually done by way of change. Apart from its case that the reactor was redesigned, DFD does not allege that it made any material changes to Chenco's process of producing AlF_3. In particular, it was not suggested that there had been any change to the 5 features of the process (other than the reactor) described in paragraph 219 of the Award. Since the tribunal found that DFD's use of that process as a whole represented the illegitimate use of Chenco's Technology, the continued use of that process necessarily engages the liability in paragraph 414 of the Award. This is, as Chenco submitted, a complete answer to DFD's case both on issue 3, but also more generally. Given that the tribunal considered that the core part of the process was protected technology, the liability in paragraph 414 continues unless and until the evidence shows that DFD ceased to use that technology.

124. It is not therefore sufficient for DFD to allege that it ceased to use one part of that technology. Any other conclusion would have the effect of negating the decision and dispositive award of the tribunal, in circumstances where the question is whether the present Award should be enforced.

125. Nor, for similar reasons, is it any answer for DFD to allege in the present proceedings that the process surrounding the reactor was not protected because it was in the public domain. That submission would require this court to reverse the tribunal's decision on the merits. The Award decides not only that the core process surrounding the reactor was protected technology, but it also rejects the public domain argument that was advanced by DFD at the hearing.

126. Finally, there is the evidence of Professor Kind as to the nature of the changes allegedly made to the reactor itself. Even if it were appropriate only to focus on the reactor design changes alleged by DFD, and to disregard the surrounding process, I accept Professor Kind's evidence that these alleged changes were no more than marginal or incremental in nature. Professor Kind's first report contained a very clear explanation of the process of making AlF_3. In Table 2, he analysed in detail the changes which DFD allegedly made to the reactor design. His conclusion was that DFD's alleged changes were immaterial and incremental, and were insufficient to remove Chenco's Technology even if one looks only at the reactor. There was no effective challenge to that evidence in cross-examination, and no independent expert evidence was called by DFD to challenge what Professor Kind had said. I accept that evidence.

127. Accordingly, Chenco's entitlement to enforce paragraphs 414 and 417 in these proceedings succeeds for these additional reasons.

Issue 4

128. In the light of my conclusion on Issues 1-3, it is not necessary to address Issue 4.

Other issues

129. In DFD's written closing, a number of other points were made. These included, in Section A of its submission, the following: that Chenco would be fully compensated by paying the "actual damage" rather than the "penalties" ordered in paragraph 414 and interest thereon; that the Chinese courts had only partially recognised and enforced the Award; that enforcement proceedings had commenced in Canada, and certain receivables in the sum of approximately US$ 700,000 had been frozen; and that enforcement had also been sought in Malaysia. I have already addressed the penalty point. None of these points provide any reason why Chenco should not be entitled to enforce the award in respect of the period after 23 April 2013, in the light of my findings above.

130. In Section D of its written closing, DFD submitted that Professor Kind lacked independence, on the basis that he had been recommended to Chenco by a Professor Stichlmair in 2012 and had provided professional services to Chenco on two occasions. Prof Stichlmair was one of the arbitrators. I do not accept that any of these matters gives rise to doubts as to the independence of Professor Kind. He had prepared reports which were thorough and well-reasoned, and to which there was no responsive independent expert evidence. He answered the (very limited) questions asked by Mr Wu in a straightforward manner. I then asked him some questions, and these too were answered clearly, and with the benefit of Professor Kind's very obvious expertise. I have no hesitation in relying upon his evidence.

131. In Section E of its written closing, DFD relied upon the alleged lack of independence and neutrality of Professor Stichlmair. This was not a point which fell within the scope of the present trial: it was not pleaded, and was only raised in closing submissions. No evidence was directed towards it. I note too that the award was issued many years ago, and was challenged in Switzerland but the challenge was withdrawn. This court has already decided to enforce the Award, save in relation to the issue concerning the period after 23 April 2013. In these circumstances, I do not consider it necessary or appropriate to address this point.

Conclusion

132. Chenco is entitled to judgment on the Award, in the sum of € 4,000,000, together with interest thereon as awarded by the tribunal.