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AWARD

CHAMBRE DE COMMERCE INTERNATIONALE — INTERNATIONAL CHAMBER OF COMMERCE (ICC)
COUR INTERNATIONALE D'ARBITRAGE — INTERNATIONAL COURT OF ARBITRATION

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ICC INTERNATIONAL COURT OF ARBITRATION

CASE No. 23366/MK

TETRONICS (INTERNATIONAL) LIMITED

(United Kingdom)

vs/

1. BLUEOAK ARKANSAS, LLC

(U.S.A.)

2. BLUEOAK RESOURCES, INC.

(U.S.A.)

This document is an original of the Final Award rendered in conformity with the Rules of Arbitration of the ICC International Court of Arbitration.

ICC Case No. 23366/MK

INTERNATIONAL CHAMBER OF COMMERCE
INTERNATIONAL COURT OF ARBITRATION

TETRONICS (INTERNATIONAL) LIMITED (United Kingdom)

Claimant

v.

BLUEOAK ARKANSAS, LLC (U.S.A.) and
BLUEOAK RESOURCES, INC. (U.S.A.)

Respondents

FINAL AWARD

Gerald W. Ghikas, Q.C. **Sole Arbitrator**
Vancouver Arbitration Chambers
Suite 1500
701 West Georgia Street
Vancouver, British Columbia
Canada V7Y 1C6

FINAL AWARD

I. OVERVIEW

1. This dispute arises out of a contract for the design, manufacture, and sale by the claimant, Tetronics (International) Limited (**Tetronics**), to the respondent, BlueOak Arkansas, LLC (**BlueOak**), of a plasma arc furnace for smelting e-waste to extract and concentrate precious metals into a commercially tradeable alloy typically containing copper, gold, silver and palladium. The furnace was to be used in an e-waste recovery facility in Osceola, Arkansas, (**Facility**) owned and operated by BlueOak.

2. BlueOak and Tetronics entered into a 27 March 2014 FEED & Supply Contract (**FEED & Supply Contract**). [RX-002] The FEED & Supply Contract was later modified by Variation Agreement 01, dated 10 April 2015 (**Variation 01**) and by Variation Agreement 02, dated 4 March 2016 (**Variation 02**). [RX-001] The FEED & Supply Contract, as modified through Variation 01 and Variation 02, is referred to in this award as the "**Contract**."

3. In connection with Tetronics and BlueOak entering into the FEED & Supply Contract, Tetronics and BlueOak's affiliate, the Respondent BlueOak Resources, Inc. (**BlueOak Resources**) entered into a License Agreement dated 6 February 2014 (**License Agreement**). Under the License Agreement, Tetronics licensed to BlueOak Resources intellectual property relating to the furnace and its operation so that BlueOak Resources could sublicense that intellectual property to BlueOak. [CX-004]

4. Disputes have arisen between Tetronics and BlueOak out of the Contract and between Tetronics and BlueOak Resources out of the License Agreement. Those disputes have been referred to arbitration in this proceeding.

II. THE PARTIES AND THEIR REPRESENTATIVES

(A) The Claimant

5. Tetronics is incorporated under the laws of the United Kingdom with an office at Marston Gate, Stirling Road, South Marston Park, Swindon, United Kingdom. Tetronics supplies engineering and design services and equipment related to plasma recovery systems. [TOR ¶1]

(B) Claimant's Representatives

6. Tetronics is represented by its counsel:

Mr. Michael J. Sheehan
Ms. Michelle M. Wezner
Ms. Mary C. Dirkes
HOWARD AND HOWARD ATTORNEYS PLLC
450 West Fourth Street
Royal Oak, Michigan 48067
U.S.A.
Tel: +1 248 723 0376
Fax : +1 248 645 1568
Email: HHTetronics-BlueOak@HowardandHoward.com

(C) The Respondents

7. BlueOak is incorporated under the laws of Delaware with an office at 1024 Ohlendorf Road, Osceola, Arkansas 72370, United States of America. BlueOak was at all material times the owner of the e-waste processing Facility in Osceola, Arkansas. [TOR ¶3]

8. BlueOak Resources is incorporated under the laws of Delaware with an office at 1534 Plaza Lane #244, Burlingame, California 94010, United States of America. BlueOak Resources is a shareholder of BlueOak. [TOR ¶4]

(D) Respondents' Representatives

9. BlueOak and BlueOak Resources are represented by their counsel:

Mr. Sashe Dimitroff
Mr. Marco Molina
Ms. Alexandra L. Trujillo
BAKER & HOSTETLER LLP
811 Main Street
Suite 1100
Houston, Texas 77002
U.S.A.
Tel: +1 713 646 1320
Email: sdimitroff@bakerlaw.com
Email: mmolina@bakerlaw.com
Email: atrujillo@bakerlaw.com

(E) Secretariat of the ICC International Court of Arbitration

10. Counsel in charge of this arbitration at the Secretariat of the International Chamber of Commerce International Court of Arbitration (**Secretariat**) is:

Mr. Marek Krasula, Counsel
International Chamber of Commerce
International Court of Arbitration SICANA Inc.
140 East 45th Street, Suite 14C
New York, NY 10017, USA
Tel: 1-646-699-5704
Email: ica9@iccwbo.org

III. THE COMMERCIAL AGREEMENTS AND THE ARBITRATION AGREEMENT

(A) License Agreement

11. Tetronics and BlueOak Resources entered into the 6 February 2014 License Agreement under which Tetronics licensed to BlueOak Resources certain patents, know-how and other intellectual property rights associated with equipment for a plasma arc furnace to be supplied to BlueOak and associated with the process of using the equipment to treat precious metal bearing wastes and other materials. [TOR ¶12; CX-004]

(B) FEED & Supply Contract and Variation 01

12. Tetronics and BlueOak entered into the FEED & Supply Contract dated 27 March 2014. The FEED and Supply Contract is comprised of a short, executed agreement and various Schedules incorporated by reference. Under the FEED & Supply Contract Tetronics agreed to perform front-end engineering and design services in relation to a proposed plasma recovery system and to manufacture, install and commission equipment at BlueOak's e-waste processing Facility in Arkansas. The FEED & Supply Contract was varied on 10 April 2015 by Variation 01. [TOR ¶12; RX-002]

(C) Variation 02

13. After installation of a first system at the Facility, on 16 November 2015 there was a catastrophic event in which molten metal escaped causing substantial damage. The FEED & Supply Contract was then further varied on 4 March 2016 by Variation 02 to provide for the supply of a replacement system. [TOR ¶¶10,11]

14. Variation 02 is comprised of a short executed operative agreement, attaching and incorporating by reference several Schedules and their Annexes, as follows: [RX-001]

    a. Schedule A to Variation 02 is entitled "Consolidated Varied Contract (Contract Agreement & Schedules 1-3) Variations Highlighted" and is comprised of a copy of the original FEED & Supply Contract and its first three schedules (Schedule A "Phase I Conditions"; Schedule 2 "Phase II Contract Particulars", and; Schedule 3 "Conditions;" and

    b. Schedule B to Variation 02 is entitled "Variations to the Balance of the Schedules to the Contract" and is comprised of a chart describing changes to Schedules 4-14 of the FEED & Supply Contract, in some cases referring to replacement Schedules or Additional Schedules that are attached to the chart as "Annexes" 1-12.

15. Clause 2 of the operative agreement states: [RX-001]

> **2. Variation of Contract**
>
> 2.1 With effect from the Variation Date 02 [4 March 2016], the Buyer and Seller agree on the variations to the [FEED & Supply Contract] as shown in the Schedules A and B of this Variation Agreement 02.
>
> 2.2 The Parties confirm that the [FEED & Supply Contract] shall remain fully effective as varied by this Variation Agreement 02. The Parties acknowledge and agree that, subject to Clause 4.1 below, nothing in this Variation Agreement 02 is intended to waive or alter any rights or obligations of the Parties with respect to events that accrued prior to the date hereof and the Initial Contract governs with respect to all such matters.

16. As a consequence, from and after 4 March 2016 the contractual rights and obligations of the parties were governed by the FEED & Supply Contract as amended by Variation 01 and as subsequently amended by Variation 02, which are collectively referred to in this award as the "**Contract**."

(D) Arbitration Agreements

16. Each of the original FEED & Supply Contract, the operative agreement forming part of Variation 02, the Contract as amended by Variation 02 and the License Agreement contains an arbitration agreement. [TOR ¶¶13-17]

17. Clause 5.1 of the operative agreement that is part of Variation 02 states: [RX-001]

> **Disputes, Governing Law and Jurisdiction**
>
> 5.1 Disputes or claims arising out of or in connection with this Variation Agreement 02 shall be determined as set out in the [FEED & Supply Contract] at Clause 16 (Arbitration and Governing Law). This Variation Agreement 02 or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and interpreted in accordance with the law of New York, United States of America.

18. Clause 16 of Schedule 3 to the original FEED & Supply Contract contained an arbitration agreement. As and from 4 March 2016, Schedule 3 to the Feed & Supply Agreement was replaced by Schedule 3 to Schedule A to Variation 02. Clause 16 of the original Schedule 3 and Clause 16 of the replacement Schedule 3 are identical. They state: [RX-001, 002]

> 16. **ARBITRATION AND GOVERNING LAW**
>
> 16.1 The parties shall firstly attempt to amicably settle all disputes, controversies or differences of any kind which arise between the parties in connection with or arising out of this Contract through private negotiation. If the parties concerned fail to amicably settle such disputes, controversies or differences through private negotiation within one (1) month (except as otherwise specified in this Contract), such disputes , controversies or differences shall be finally and exclusively resolved by arbitration under the then current conciliation and arbitration rules of the International Chamber of Commerce, Paris (the "ICC Rules"). The arbitration shall be conducted in accordance with the ICC Rules. The parties agree that:
>
> (a) One arbitrator shall be appointed in accordance with the ICC Rules
>
> (b) The place of arbitration shall be Paris, France unless the parties mutually agree upon another place and the arbitration proceedings (*sic*).
>
> (c) The arbitrators shall be bound by the provisions of the ICC Rules. Each party hereto consents to the joinder in any arbitration proceeding brought pursuant to this Contract, of any and all additional parties as shall be reasonably necessary, in the opinion

of either of the parties hereto, to a full and complete resolution of the matter or matters being arbitrated; each party further consents to joinder in any arbitration or other action involving such parties.

(d) The arbitration award shall be enforceable by any court in any jurisdiction in which the Seller or the Buyer is domiciled, may be found or has assets and the parties (*sic*) consent to the jurisdiction of any such court.

19. Clause 19 of the License Agreement states: [CX-004]

19. ARBITRATION AND GOVERNING LAW

19.1 All disputes, controversies or differences of any kind which arise between the parties hereto in connection with or arising out of this Agreement shall in the first place be amicably settled by and between the parties concerned through private negotiation. If the parties concerned fail to amicably settle such disputes, controversies or differences through private negotiation within one (1) month (except as otherwise specified in this Agreement), such disputes, controversies or differences shall be finally and exclusively resolved by arbitration under the then current rules of the International Chamber of Commerce, Paris (the "ICC Rules"). The arbitration shall be conducted in accordance with the ICC Rules.

19.2 One arbitrator shall be appointed in accordance with the ICC Rules.

19.3 The place of arbitration shall be Paris, France unless the parties mutually agree upon another place and the arbitration proceedings (*sic*).

19.4 The arbitrators shall be bound by the provisions of the ICC Rules. Each party hereto consents to the joinder in any arbitration proceeding brought pursuant to this Agreement, of any and all additional parties as shall be reasonably necessary, in the opinion of either the parties hereto, to a full and complete resolution of the matter or matters being arbitrated; each party further consents to joinder in any arbitration or other action involving such parties.

19.5 The arbitration award shall be enforceable by any court in any jurisdiction in which the [sic] either party is domiciled, may be found

or has assets and the parties (*sic*) consent to the jurisdiction of any such court.

19.6 This Agreement shall be governed and construed in accordance with the laws of the State of New York, United States of America.

(E) Applicable Laws

20. Each of the relevant agreements is stated to be governed by New York law. [TOR ¶¶18-21]

21. Clause 5.1 of the operative agreement forming part of Variation 02, which is quoted in full above, states: [RX-001]

> … This Variation of Agreement 02 or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and interpreted in accordance with the law of New York, United States of America.

22. Clause 18.5 of Schedule 3 to the FEED & Supply Contract and Clause 18.5 of Schedule 3 to Schedule A to Variation 02 are identical. They state: [RX-002]

> **18.5 Governing law**
>
> This Contract and any dispute, claim or obligation (whether contractual or non-contractual) arising out of or in connection with it, its subject matter or formation shall be governed by the law of New York, United States of America.

23. Clause 19.6 of the License Agreement states: [CX-004]

> 19.6 This Agreement shall be governed and construed in accordance with the law of the State of New York, United States of America.

(F) Applicable Rules of Procedure

24. The procedural rules governing this proceeding are the Arbitration Rules of the International Chamber of Commerce in force as and from 1 March 2017 (**ICC Rules**) and any supplementary rules, hearing protocols or directions that may be established from time to time by agreement of the parties or by the Sole Arbitrator. [TOR ¶22]

25. By the Terms of Reference, the parties agreed that, except to the extent, if any, that they are in conflict with the ICC Rules, the Sole Arbitrator may have regard to the IBA Rules on Taking of Evidence in International Arbitration in the exercise of his discretion with respect to procedural matters. [TOR ¶23]

(G) Language of the Arbitration

26. The language of the arbitration is English. [TOR ¶24]

(H) Place of Arbitration

27. Pursuant to the Arbitration Agreements, the seat of arbitration is Paris, France. [TOR ¶25]

IV. PROCEDURAL HISTORY

(A) Request for Arbitration

28. Tetronics delivered the Request for Arbitration (**Request)** to the Secretariat by letter dated 17 January 2018. The Request named BlueOak as sole respondent. By correspondence dated 18 January 2018 the Secretariat acknowledged receipt of the Request on 17 January 2018. [TOR ¶26]

29. By letter dated 29 January 2018 the Secretariat notified BlueOak of the Request and informed it that it had 30 days from the day following receipt of such correspondence within which to deliver an Answer. BlueOak received the Secretariat's notification of the Request for Arbitration on 31 January 2018. [TOR ¶27]

(B) Emergency Measures Proceeding

30. By letter dated 2 February 2018 Tetronics submitted an Application for Emergency Measures (**Emergency Measures Application**) to the Secretariat pursuant to Article 1 of the Emergency Arbitrator Rules set out in Appendix V to the ICC Rules (**EA Rules**). On 5 February 2018, the President of the ICC Court appointed an Emergency Arbitrator pursuant to Article 2 of the EA Rules. [TOR ¶46]

31. Tetronics sought an order enjoining BlueOak from drawing on an advance payment bond which had been provided pursuant to the Contract, or alternatively requiring that any funds paid under the bond be placed in escrow. BlueOak made a counter-

application for an order requiring Tetronics to provide security for any award that might be granted in respect of BlueOak's Counterclaim. On 16 February 2018 the Emergency Arbitrator issued an Order (**EA Order**) rejecting the Emergency Measures Application and the Respondent BlueOak's counter-application for interim relief, allocating costs of the EA proceedings to Tetronics and rejecting all other requests for costs of the Emergency Measures Proceedings. [TOR ¶47]

(C) BlueOak's Answer and Counterclaim

32. By email correspondence dated 28 February 2018 Tetronics and BlueOak advised the Secretariat that they had agreed to extend the deadline for delivery of the Answer and Counterclaim until 5 March 2018. By email correspondence dated 1 March 2018 the Secretariat confirmed that the time for submitting an Answer was extended to 5 March 2018. [TOR ¶28]

33. By letter dated 5 March 2018 BlueOak submitted to the Secretariat its Answer and Counterclaim (**Answer and Counterclaim**). By letter dated 9 March 2018 the Secretariat acknowledged receipt and delivered a copy of the Answer and Counterclaim to Tetronics. [TOR ¶29]

(D) Request for Arbitration Against Additional Party (BlueOak Resources)

34. On 19 March 2018 the Secretariat received from Tetronics a Request for Joinder dated 6 March 2018 (**Request for Joinder**), seeking to join BlueOak Resources as an additional party to this arbitration. By letter dated 22 March 2018 the Secretariat acknowledged receipt and delivered a copy of the Request for Joinder to BlueOak. [TOR ¶30]

35. By further letter dated 22 March 2018 the Secretariat notified BlueOak Resources of the Request for Joinder at the address provided by Tetronics, and informed BlueOak Resources that its Answer to the Request for Joinder was due within 30 days after receipt of the notification. On 26 March 2018 the Secretariat advised Tetronics that the delivery of its notification had failed due to an incorrect address and asked for an alternative address to which notification could be made. Delivery

of the 22 March 2018 notification and the Request for Joinder was made to the alternative address for BlueOak Resources on 29 March 2018. [TOR ¶31]

(E) BlueOak Resources' Answer

36. By letter dated 30 April 2018, BlueOak Resources submitted its Answer to the Request for Joinder (**Answer**). By letter dated 2 May 2018 the Secretariat acknowledged receipt of the Answer and delivered copies to Tetronics and BlueOak. [TOR ¶32]

(F) The Sole Arbitrator's Appointment

37. By letters dated 29 January 2018 the Secretariat advised Tetronics and BlueOak that if the parties failed to nominate the sole arbitrator within 30 days from the date that BlueOak received the Request or any additional time allowed by the Secretariat, the ICC International Court of Arbitration (**ICC Court**) would appoint an arbitrator pursuant to Article 12(3) of the ICC Rules. [TOR ¶35]

38. By letter dated 6 February 2018 the Secretariat informed the parties that the time limit granted for the appointment of the sole arbitrator was extended to 2 March 2018. [TOR ¶36]

39. All parties asked the ICC Court to appoint the sole arbitrator. By letter dated 24 May 2018 the Secretariat advised the parties that at its session that day the ICC Court had appointed Gerald W. Ghikas, Q.C. as Sole Arbitrator (**Sole Arbitrator**) upon the Canadian national Committee's proposal. [TOR ¶39]

40. The address of the of the Sole Arbitrator is:

Gerald W. Ghikas, Q.C.
Vancouver Arbitration Chambers
Suite 1500
701 West Georgia Street
Vancouver, British Columbia,
Canada V7Y 1C6
Tel: +1.604.725.8862
Email: gghikas@ghikasarbitration.com

41. By signing the Terms of Reference, the parties confirmed that they have no objection to the appointment of the Sole Arbitrator. [TOR ¶43]

(G) New Caption for Proceedings

42. By separate correspondence dated 27 March 2018 Tetronics and BlueOak agreed that, from among several alternatives suggested by the Secretariat, the caption for these proceedings should be "TETRONICS (INTERNATIONAL) LIMITED (United Kingdom) vs/ 1. BLUEOAK ARKANSAS, LLC (U.S.A.) 2. BLUEOAK RESOURCES, INC. (U.S.A)". By correspondence dated 30 April 2018 BlueOak Resources agreed with this proposed caption. By letter dated 2 May 2018 the Secretariat advised that pursuant to the parties' agreement, the caption in these proceeding was amended as agreed. [TOR ¶33]

(H) Tetronics' Reply

43. By letter dated 10 April 2018 Tetronics submitted to the Secretariat its Reply to BlueOak's Counterclaims (**Reply**). By letter dated 11 April 2018 the Secretariat acknowledged receipt and delivered copies of the Reply to BlueOak and BlueOak Resources. [TOR ¶34]

(I) Transmission of the File

44. Pursuant to Article 16 of the ICC Rules, the Secretariat transmitted the file to the Sole Arbitrator on 24 May 2018. [TOR ¶41]

(J) Case Management Conference, Terms of Reference and Procedural Timetable

45. A draft of the Terms of Reference was delivered to the parties by the Sole Arbitrator on 30 May 2018. The parties provided comments on the draft Terms of Reference on 8 June 2018. A revised draft was sent to the parties by the Sole Arbitrator on 8 June 2018. During a Case Management Conference conducted by conference telephone on 20 June 2018 the parties and the Sole Arbitrator discussed the Terms of Reference, supplemental procedural rules and a Procedural Timetable. The final content of these Terms of Reference was agreed through subsequent exchanges of correspondence. [TOR ¶42]

46. By letter dated 6 July 2018 the Secretariat acknowledged receipt of the Procedural Timetable. The signed Terms of Reference were delivered to the Secretariat by email communication dated 31 July 2018. On 2 August 2018 the Secretariat acknowledged receipt of the Terms of Reference.

(K) Procedural Orders

47. From time to time the Sole Arbitrator determined procedural matters, recorded agreements of the parties as to procedural matters or gave procedural directions by issuing procedural orders. The matters so addressed are summarized in the following paragraphs:

(a) Procedural Order No. 1, 25 June 2018 (revised 27 July 2018)

48. Procedural Order No. 1 was issued on 25 June 2018 to establish, after consultation with the parties, supplementary procedural rules. Procedural Order No. 1 was revised and reissued on 27 July 2018 after hearing submissions from the parties concerning specific revisions proposed by Respondents.

(b) Procedural Order No. 2, 29 June 2018

49. Procedural Order No. 2 directed Respondents to identify the documents comprising what was referred to as the "Hatch Report" and established a process for the preparation of a confidentiality order.

(c) Procedural Order No. 3, 26 July 2018

50. Procedural Order No. 3 decided the appropriate form of confidentiality order, gave directions concerning the production of the Hatch Report and recorded the positions of the parties concerning changes to Procedural Order No. 1 that were proposed by Respondents.

(d) Procedural Order No. 1, REVISED, 27 July 2018

51. The revised version of Procedural Order No. 1 was issued on 27 July 2018, including some, but not all, of the changes requested by Respondents.

(e) Stipulated Protective Order, 27 July 2018

52. The parties had submitted to the Sole Arbitrator two different versions of a Stipulated Protective Order, authorizing the Sole Arbitrator to determine the appropriate form of order, which all parties agreed to sign and by which all parties agreed to be bound. After hearing from the parties, Procedural Order No. 3 had

determined the appropriate form of order. The Stipulated Protective Order was issued dated as of 27 July 2018.

(f) Procedural Order No. 4, 3 October 2018

53. Procedural Order No. 4 dismissed applications by Tetronics for orders:

    a. Barring Respondents' expert designation of individuals of Hatch; or

    b. Alternatively, finding that Respondents' disclosure to Hatch was a breach of Respondents' confidentiality obligations to Tetronics;

    c. Barring the use of the "Sensitive Commercial Information" (**SCI**) designation for any Hatch related documents or analysis; and

    d. Finding a full reservation of rights for Tetronics on its breach of contract claim against Respondents.

(g) Procedural Order No. 5, 4 October 2018

54. Procedural Order No. 5 declared that certain applications of Tetronics were moot in the light of subsequent events.

(h) Procedural Order No. 6, 5 October 2018

55. Procedural Order No. 6 dismissed an application by Tetronics for an order requiring Respondents to deliver alloy samples.

(i) Rulings on Document Production Requests, 25 October 2018

56. On 25 October 2019, the parties' Redfern Schedules were delivered to the parties, showing the Sole Arbitrator's rulings on document production requests.

(j) Procedural Order No. 7, 1 November 2018

57. Procedural Order No. 7 dismissed applications by Respondents for orders finding that spoliation is not applicable to this arbitration, or, alternatively, ruling that, even if spoliation was applicable, spoliation would not occur if the Respondents took certain specified steps to dismantle and dispose of the furnace supplied by

Tetronics. The Order established a protocol whereby, if it wished, Tetronics could observe and make a video recording of the work that Respondents proposed to undertake.

(k) Procedural Order No. 8, 2 November 2018

58. Procedural Order No. 8 gave directions concerning document production questions raised by the parties.

(l) Procedural Order No. 9, 4 November 2018

59. Procedural Order No. 9 allowed an application by Tetronics to set aside Respondents' SCI designations of documents comprising the Hatch Report.

(m) Procedural Order No. 10, 13 November 2018

60. Procedural Order No. 10 allowed an application by Respondents for directions requiring Tetronics to review and narrow certain of its SCI designations.

(n) Procedural Order No. 11, 29 January 2019

61. Procedural Order No. 11 decided cross-applications of the parties concerning various procedural matters and ordered that:

    a. the Respondents were granted leave to amend and supplement the counterclaims;

    b. the date for delivery of the Second Memorials was extended until 4 February 2019;

    c. the Evidentiary Hearing was adjourned until 5 August 2019 for 9 days and a REVISED Procedural Timetable was issued;

    d. applications of both parties for interim measures involving the provision of security were dismissed; and

    e. the application of the Respondents for production of additional insurance documents was dismissed.

(o) Procedural Order No. 12, 23 February 2019

62. Procedural Order No. 12 granted Tetronics leave to amend the Statement of Claim, ordered Tetronics to deliver a Supplemental Second Memorial relating solely to the claims and defences added by way of amendment by 1 March 2019, and gave directions that the parties should respond to each others' new claims and allegations in their respective Third Memorials and deliver rejoinders with respect to their new allegations and claims on 1 July 2019. A Further Revised Procedural Timetable was issued.

(p) Procedural Order No. 13, 26 March 2019

63. Paragraph 118 of the original Statement of Counterclaims dated 24 December 2018, forming part of Respondents' First Memorial, states:

> Respondents estimate that the monetary value of the claims submitted herein amount to at least US$12,966,387.96. Respondents reserve all rights with respect to calculation of damages and further pleadings and arguments with respect to damages, including liquidated damages and lost profits.

64. In their Amended and Supplemented Statement of Counterclaims, Respondents allege that Tetronics' breaches of contract, negligent misrepresentations and professional negligence and malpractice caused the Respondents to receive no viable asset or revenue stream, "resulting in lost profits or consequential damages." The document states further that the "exact amount of such lost profits or consequential damages are not known at this stage of the litigation, but the amount can be reasonably ascertained and BlueOak is prepared to demonstrate with sufficient certainty these amounts at trial through experts, fact witnesses, and documentary evidence." No evidence to support a claim for lost profits was submitted by Respondents with their First or Second Memorials.

65. By the Amended and Supplemented Statement of Counterclaims Respondents also added a claim seeking indemnification for all damages incurred as a result of secured creditors' demands on the Respondents and the anticipated foreclosure on BlueOak's assets. Respondents contended that evidence to quantify losses claimed by the amendments should be delivered with their Third Memorial.

66. Procedural Order No. 13 directed Respondents to advise the Sole Arbitrator and the Claimants by 2 April 2019 whether they are in fact claiming lost profits, and ordered

that, absent a showing of good cause as to why such evidence was not delivered sooner, the time for presenting evidence to support any counterclaim for damages in the form of lost profits had passed, except for any proper reply evidence.

67. Procedural Order No. 13 determined that Respondents had shown good cause as to why it was not possible to quantify the amounts claimed by way of indemnification in respect of claims by its secured creditors. It ordered that:

    a. On or before 9 April 2019 deliver a written statement of the amounts claimed as damages by way of indemnification for claims made against the Respondents by Secured Creditors and all documents tendered as exhibits in support of the quantum claimed;

    b. On or before 16 April 2019 deliver any witness statements or expert evidence relied upon to support the quantum so claimed;

    c. Tetronics could then answer the indemnity claims in its Third Memorial.

68. Procedural Order No. 13 also granted Tetronics' leave to renew its application for security as a result of changed circumstances, including Respondents' new counterclaims, and established a briefing schedule for that application.

(q) Withdrawal of Certain Counterclaims

69. On 29 March 2019 Respondents wrote to the Sole Arbitrator and Tetronics asking the Sole Arbitrator to confirm that if the Respondents decided to withdraw their lost profits and indemnity counterclaims then there would be no basis for Tetronics to renew its application for security. Alternatively, Respondents sought leave to renew their application for security.

70. In an email communication to the parties dated 1 April 2019, the Sole Arbitrator said (in relevant part):

> It is correct that the only aspect of Tetronics' applications for security which I am prepared to reconsider at this stage is whether the Respondents should be required to post security for Tetronics' costs to defend the counterclaims – only that issue is to be the subject of the further briefing I have authorized.

> …. It is correct that the fact that the Respondents have increased the amount of their counterclaim, and expanded the scope of the allegations in the counterclaim, were factors that impacted my decision to allow Tetronics to renew one part of its security application. That is clearly set out in the Order. I do not consider it appropriate, however, to respond to the Respondents' questions about what I would do if they were to choose to abandon any part of their claims. It seems to me that any discussions about whether Tetronics' application should proceed if claims are abandoned should take place between the parties. If claims actually are abandoned, the Respondents are of course free to raise that as an answer to the renewed application, which I propose to decide on its merits after giving both parties an opportunity to be heard.

71. By an email communication dated 2 April 2019 Respondents stated "Respondents withdraw their request for lost profits and indemnity." In response to a request for clarification from the Sole Arbitrator dated 6 April 2019, Respondents confirmed by email communication dated 8 April 2019 that "that the damages claims that are withdrawn are those set out in paragraphs 175 and 176 of Respondents' Amended and Supplemented Statement of Counterclaims."

(r) Procedural Order No. 14, 8 April 2019

72. Procedural Order No. 14 refused Tetronics' renewed application for security for the costs of defending the counterclaims.

(s) Rulings on Supplemental Document Production Requests, 9 April 2019

73. On 9 April 2019 the Sole Arbitrator returned to the parties their respective Redfern Schedules setting out rulings on supplemental document production requests.

(t) Procedural Order No. 15, 1 August 2019

74. Procedural Order No. 15 (in the form of an email communication) allowed in part and refused in part requests of Respondents to admit additional documents to the record.

(L) Memorials

75. As directed by the Sole Arbitrator the parties delivered Memorials as follows:

First Memorials (**CM1** and **RM1**)	25 September 2018

Second Memorials (**CM2** and **RM2**) 4 February 2019
Third Memorials (**CM3** and **RM3**) 10 June 2019
Fourth Memorials (**CM4** and **RM4**) 1 July 2019

(M) Organizational Conference and Hearing Agenda

76. On 18 July 2019 the Sole Arbitrator conducted a procedural telephone conference with counsel to organize the evidentiary hearing.

(N) Costs Stipulation

77. By email correspondence dated 2 August 2019 the parties advised the Sole Arbitrator of an agreement concerning costs, as follows (**Costs Stipulation**):

> The parties have agreed to stipulate to certain fees and costs, and thereby eliminate the need for any further legal argument and briefing on these issues. Specifically, the parties stipulate:
>
> 1. Each party has incurred at least $1 million USD in reasonable and necessary attorneys' fees and expenses in this action. This $1 million amount encompasses all hearing and travel and expenses for lawyers and witnesses as well as expert fees (cumulatively "Legal Fees").
>
> 2. Each party agrees to cap their request for Legal Fees at $1 million USD.
>
> 3. This stipulation does not cover ICC costs (e.g., arbitrator fees and ICC administrative costs).
>
> 4. Each party agrees to give you full discretion to determine either
>
> a. Whether there is a single prevailing party, and if so, whether that party should be awarded the full $1 million stipulated Legal Fees or some lesser amount, or
>
> b. Whether each party has prevailed on different issues. To the extent the Arbitrator determines that each party prevailed on different issues, the parties agree to give the Arbitrator sole discretion to determine what amounts should be awarded to each party, with offsets to result in a single net award to one party.
>
> It is the parties' intent that this stipulation obviate the need for any post-hearing submissions on attorney fee or cost awards, although, of course, should the Arbitral Tribunal request additional submissions, we would be glad to provide same. This is being sent by consent of both the parties.

(O) The Evidentiary Hearing

78. The evidentiary hearing took place in Paris, France, on 5-9 and 12-14 August 2019.

(P) Post-Hearing Briefs

79. On 19 August 2019 the Sole Arbitrator delivered to the parties Guidelines for Post-Hearing Briefs setting out issues that the Sole Arbitrator wished the parties to address in their post-hearing briefs. After consultation with the parties, revised Guidelines (**Guidelines**) were issued on 9 September 2019.

80. The parties delivered First Post-Hearing Briefs (**CPHB1** and **RPHB1**) on 22 October 2019. They delivered second Post-Hearing Briefs (**CPHB2** and **RPHB2**) on 19 November 2019.

(Q) Closure of Proceedings

81. On 18 December 2019 the Sole Arbitrator declared proceedings closed pursuant to Article 27(1) of the ICC Rules

(R) Time for Delivery of Award

82. By letter dated 12 July 2018, the Secretariat informed the Sole Arbitrator and the parties that at its session that day the Court fixed 5 July 2019 as the time limit for the final award based on the Procedural Timetable, pursuant to Article 31(1) of the ICC Rules. By email communication dated 5 July 2019 the Secretariat advised that on 4 July 2019 the Court extended the time limit for rendering the final award until 15 October 2019, pursuant to Article 31(2) of the ICC Rules. By email communication dated 15 October 2019 the Secretariat advised that on 3 October 2019 the ICC Court extended the time limit for rendering the final award until 12 January 2020 pursuant to Article 31(2) of the ICC Rules. By email communication dated 31 January 2020 the Secretariat advised that on 9 January 2020 the ICC Court extended the time for rendering the final award until 12 February 2020 pursuant to Article 31(2) of the ICC Rules. By email communication dated 13 February 2020 the Secretariat advised that on 6 February 2020 the ICC Court extended the time for rendering the final award until 31 March 2020 pursuant to Article 31(2) of the ICC Rules. By email communication dated 31 March 2020 the Secretariat advised that on 5 March 2020 the ICC Court further extended the time for rendering the final award until 30 April 2020 pursuant to Article 31(2) of the ICC Rules.

V. JURISDICTION

83. No party objects to the jurisdiction of the Sole Arbitrator. The parties agree that the Sole Arbitrator has jurisdiction to settle the disputes described in and to grant the relief claimed in the Request, the Answer and Counterclaim, the Reply, the Request for Joinder, the Answer and the Terms of Reference and any subsequent submissions allowed by the Sole Arbitrator. [TOR ¶48]

VI. THE FACTUAL BACKGROUND

84. The background facts set out in this Part of this award either are undisputed or are facts as found by the Sole Arbitrator based on a careful consideration of the evidence and submissions of the parties. This is not intended to be an exhaustive statement of the relevant facts. Where necessary, additional findings are set out in other parts of this award.

(A) Background to the License Agreement

85. BlueOak Resources was established in 2011 to develop novel solutions for recovering value from electronic waste. From 2011 to 2013, BlueOak Resources researched technologies and solicited bids in search of a technology provider for an e-waste recycling facility business plan. During this time, BlueOak Resources began discussions with Tetronics. [RWS9 (First Witness Statement of Privahini Bradoo) ¶6]

86. Tetronics describes itself as a designer and supplier of innovative engineering solutions for effective environmental waste treatment, resource recovery solutions and hazardous waste disposal. Tetronics had supplied a number of plasma arc furnaces for a range of materials and volumes. [CWS99 (First Witness Statement of Graeme Rumbol) ¶¶3]

87. BlueOak was formed in 2013 as an operational, single-purpose entity. The purpose of BlueOak was to develop multiple e-waste recycling facilities in the United States (specifically, at the beginning, the Facility in Osceola, Arkansas). [RWS9 (Bradoo) ¶7; RWS1 (First Witness Statement of Ahab Garas) ¶8] BlueOak's shareholders include institutional and sovereign investors. Its ground-breaking ceremony for the Osceola Facility was attended by many dignitaries including former Vice-President Al Gore. [RWS1 (Garas) ¶5]

88. BlueOak Resources owns a minority shareholder interest in BlueOak. BlueOak Resources was not involved in the day-to-day technical operations, management or control of the Facility. [RWS9 (Bradoo) ¶8]

89. By early 2014, BlueOak, BlueOak Resources and Tetronics had begun serious negotiations for the design, manufacture, installation and commissioning of a plasma arc furnace and precious metal recovery system. Before entering into any design and supply contract, Tetronics insisted on protecting its patents, know-how and intellectual property rights related to the plasma arc furnace and process. [RWS9 (Bradoo) ¶8]

90. On 6 February 2014, BlueOak Resources and Tetronics entered into the License Agreement. [RX-109; RWS9 (Bradoo) ¶9] BlueOak Resources was the entity that entered into this agreement with Tetronics because, at the time, BlueOak was not fully funded. There remained the possibility that the Osceola project would not receive anticipated funding from investors. If this were to happen, BlueOak Resources did not want to lose its negotiated deal and license to use Tetronics' technology for future ventures. [RWS9 (Bradoo) ¶10]

91. The License Agreement authorized BlueOak Resources to grant a sub-license of the Tetronics technology to BlueOak. [RX-109, §2.1] BlueOak Resources entered into a sub-licensing agreement with BlueOak requiring BlueOak to adhere to the terms of the Licensing Agreement. [RWS9 (Bradoo) ¶11]

92. The License Agreement states (in relevant part): [RX-109]

> **5. CONFIDENTIALITY**
>
> 5.1 Each party agrees during the term of this Agreement and after expiry or termination of this Agreement howsoever arising to keep secret and confidential all Confidential Information obtained from the other. Each party further agrees to use such Confidential Information exclusively for the purposes of this Agreement, and only to disclose the same as follows:
>
> > 5.1.1 (in the case of the Licensee) to its directors or employees concerned in the manufacture or use of the Furnace and operation of the Process; and
> >
> > 5.1 .2 (in the case of the Licensor) to its directors and employees concerned in the supply and operation of the Process and the Furnace.

5.2 The provisions of clause 5. 1 shall not apply to Confidential Information or other information which the Licensor or the Licensee (as the case may be):

5.2.1 can prove to have been in its possession (other than under any obligation of confidence) at the date of receipt or which becomes public knowledge otherwise than through a breach of any obligation of confidentiality owed to the party communicating such information to the other; or

5.2.2 is required to disclose in the course of servicing or repair of the Equipment and (subject to the agreement of the other party) in the course of marketing or of sales; or

5.2.3 is required to disclose pursuant to an obligation under statute or to a statutory or governmental body.

(B) FEED & Supply Contract

93. BlueOak's business plan included crushing and melting e-waste, such as old computer circuit boards, to extract the precious and semi-precious metals they contained, which include gold, copper, silver, and platinum group metals (**PGMs**). BlueOak would then sell the recycled metals to be included in products made by companies such as Mont Blanc and Cartier. [RWS1 (Garas) ¶4]

94. Tetronics presented to BlueOak a "Firm Price Proposal for a 7,000 Tonnes Per Year Untreated Electronics Waste Recovery Plant M" dated 21 March 2014 (**Proposal**). [CX-001, Schedule 4; RX-002, Schedule 4; RX-006] The Proposal was that Tetronics would supply and install a bespoke system using a plasma arc furnace to recover precious metals from e-waste. It was to be the first commercial scale plant of its kind in the world. In simple terms, the proposed process would take crushed electronic waste materials (such as circuit boards), remove the organic materials (mainly though incineration) and concentrate the metals into a copper rich alloy. This would be done by using the specific properties of plasma (extremely high temperature and high levels of ultraviolet light) to destroy hazardous material and melt the precious metals so that they would concentrate, by force of gravity, for extraction. [CWS69 (Rumbol) ¶8]

95. Tetronics' marketing documents state that plasma arc furnace technology, in which plasma generating electrodes are suspended over the "bath" of metal waste, has advantages in terms of operating costs and efficiency over submerged arc furnace

technology in which a “torch” is submerged into the bath. [RX-033; RX-083] The Proposal stated “[t]he electrical power delivery of the electrodes is adjusted to ensure a constant melt temperature of around 1300°C to 1600°C.” [CX-001]

96. The Proposal included a Process Flow Diagram (**PFD**) which was described as “[a] typical process flow diagram for the plasma system with indicative flows…” The PFD showed that e-waste would be mixed with lime, fed into the furnace, and processed into either off-gas (which would be removed through an off-gas system), slag (consisting of low-density elements that sat at the top of the melt bath), or metal alloy (consisting of high-density precious metals that sank to the bottom of the furnace). The PFD, and the corresponding table beneath it, indicates that the slag and the alloy would reach 1600°C inside the furnace. It includes an illustration showing a notional container of metal alloy after tapping at a temperature of 1600°C and an illustration showing a notional container of molten slag after leaving the furnace via an overflow mechanism at a temperature of 1450°C Off-gas is shown to be leaving the furnace at a temperature of 1200°C. [CX-001]

97. On 27 March 2014, BlueOak and Tetronics executed the FEED & Supply Contract. The FEED and Supply Contract is comprised of a short, executed operative agreement and various Schedules incorporated by reference. The Proposal is attached to the FEED and Supply Contract as Schedule 4. Paragraph (A) of the operative agreement states “[Tetronics] has agreed to perform front end engineering and design ("FEED") services consistent with the Proposal in relation to the proposed plasma recovery system, which services shall comprise Phase I of the Contract.” Clause 3 of the FEED & Supply Contract incorporates by reference the provisions in the Proposal relating to the Phase I Period as a “Phase 1 Contract Document.” [CX-001]

98. Paragraph (B) of the operative agreement states that after satisfaction of conditions relating to Phase I “[Tetronics] agrees to manufacture, install and Commission the Equipment for [BlueOak] and the [BlueOak] agrees to purchase the Equipment on the terms and subject to the conditions set out in the Contract.” Under Clause 4 of the FEED & Supply Contract, once the Phase 1 conditions are satisfied the entire Proposal and other specified documents are incorporated by reference as part of the “Contract.” [CX-001]

(C) Variation 01 and the Failure of the First System

99. On 10 April 2015, Tetronics and BlueOak executed Variation 01, which modified certain particulars of the Feed & Supply Contract with respect to the system that Tetronics had agreed to supply. [CX-002]

100. In November 2015, Tetronics delivered and installed the first system (**First System**) at BlueOak's Facility. The parties successfully "tapped" the furnace (extracting molten alloy) and processed the tapped alloy through an on-site granulator on one occasion. A granulator is a large piece of equipment used to form molten metal into solid balls of roughly uniform size. BlueOak originally had planned to cast the molten alloy tapped from the furnace into ingots. It had decided, however, to granulate the alloy instead. [RWS2 (Second Witness Statement of Ahab Garas) ¶¶14-19]

101. The First System ultimately passed the "hot commissioning test." On 16 November 2015, however, as the parties were testing the First System, molten metal breached the bottom of the furnace and poured out of a six-inch hole into the BlueOak Facility. As the molten metal struck the cement floor, it set off fires and damaged much of BlueOak's equipment and property. The parties evacuated their personnel and BlueOak shut down the entire Facility for two weeks until the metal cooled and first responders could secure the Facility. [RWS2 (Garas) ¶¶15-19; RWS4 (First Witness Statement of Robert Foster) ¶28]

102. The specific causes of and responsibility for the failure of the First System are <u>not</u> the subject of this arbitration.

(D) BlueOak's Insurance Claim

103. After the First System's furnace meltdown, BlueOak hired a consultant to assess the extent of the damage. The estimate was US$11,080,241.70[1] in property and equipment damage. [RWS12 (First Witness Statement of Jennifer Satorious) ¶6; RX-100] BlueOak settled with its insurer in early 2016. The amount BlueOak received did not fully cover the assessed damages resulting from the furnace meltdown or the anticipated improvements and betterments needed to prevent a second meltdown. It also did not cover operating costs associated with replacements and improvements. [RWS12 (Satorious) ¶8]

[1] All dollar amounts used in this award are expressed in United States' Dollars.

(E) Variation 02

104. BlueOak and Tetronics agreed that Tetronics would supply a replacement system (**Second System**). The design would largely be the same as the First System, but there would be modifications to build in further risk mitigation against the possibility of another furnace breakout. [CWS134 (Second Witness Statement of Graeme Rumbol) ¶5; CWS136 (Second Witness Statement of David Deegan) ¶6]

105. On 4 March 2016, the parties executed Variation 02. Variation 02 recited that:

> (C) The Parties wish to vary the Contract with effect from the (*sic*) Variation Date 02 by including the Replacement Works detailed in Annex 1 and replacing the Project Gantt Chart together with other amendments specified in this Variation Agreement 02.

106. Annex 2 to Schedule B is a "Variation Agreement Gantt Chart" establishing a revised work schedule (**VA Gantt Chart**). [RX-001]

107. With the execution of Variation 02, the "**Contract**" came into existence, comprised of the FEED & Supply Contract, as amended by Variation 01 and Variation 02. Throughout the Contract, Tetronics is referred to as "**Seller**" and BlueOak is referred to as "**Buye**r." Schedule 3 to Schedule A to Variation 02, which forms part of the Contract, is entitled "Conditions" (**Conditions**). It includes the following relevant contractual provisions: [RX-001]

> **1. Definitions and Interpretation**
>
> In this Contract, unless the context otherwise requires, the following definitions shall apply
>
> "**Confidential Information**" means any commercial or technical information, including the Seller's intellectual property, in whatever form which is disclosed by one Party to the other Party and which would be regarded as confidential by a reasonable business person including, without limitation, all business, · statistical, financial, marketing and personnel information, customer or supplier details, know-how, designs, trade secrets or software of the disclosing Party or any information that is marked as "Confidential"
>
> "**Contract**" means the agreement between the Parties evidenced in the Phase I Contract Documents and Phase II Contract Documents as amended or varied by the Parties from time to time.

…

"**Contract Price**" means the sum of £7,576,250, plus any amounts by Buyer from and after the date hereof in respect of Change Orders (as defined in Section 6.4). For purposes of clarification, the Contract Price does not include the Replacement Works Price; further, the Contract Price and the Replacement Works Price represent all amounts owed by Buyer to Seller in respect of the Equipment and the Replacement Equipment.

…

"**Equipment**" means the equipment to be designed, manufactured, supplied and/or installed by the Seller as more particularly described in the Proposal.

…

"**Final Acceptance Certificate**" or "**FA Certificate**" means the certificate issued by the Parties in accordance with Schedule 6 following successful FAT.

"**Final Acceptance Test**", "**FAT**" or "**FA Test**" means the final acceptance tests described in Schedule 6.

…

"**FOP**" means the furnace operating plans attached as Annex C to Schedule 4.

…

"**Preliminary Acceptance Test**" or "**PAT**" or "**PA Test**" means the preliminary acceptance tests described in Schedule 5.

…

"**Replacement Works CDR**" means the critical design review in relation to the design of the Replacement Works described in Schedule 14.

"**Replacement Works PDR**" means the preliminary design review in relation to the design of the Replacement Works described in Schedule 14.

…

"**Start Up**" means the term for the testing regime or period comprising both Start Up Test and Start Up Test: Second Pass. Start Up shall be deemed to commence on commencement of SUT and shall continue until issuance of the SUT 2 Certificate in accordance with Schedule 6.

"**Start Up Test**" or "**SUT**" means the start up tests described in Schedule 4A.

"**Start Up Test: Second Pass**" or "**SUT 2**" means the start up tests second pass described in Schedule 4B.

2. Supply obligations

2.1 The Seller shall, subject to the provisions of the Contract, design, manufacture, deliver to the Site oversee installation, and Commission the Plant.

2.2 In carrying out the design of the Plant, the Seller shall exercise reasonable skill, care and diligence.

2.3 The Seller warrants that the Plant shall comply with the Proposal and the Contract.

2.4 The Plant shall be delivered to the Site in accordance with the Delivery Terms.

…

2.10 On Variation Date 02, Seller and Buyer shall commence Replacement Works PDR [Preliminary Design Review] in accordance with Schedule 14. Once the Parties successfully complete Replacement Works PDR in accordance with Schedule 14, the Parties shall proceed to Replacement Works CDR. Prior to the completion of the Replacement Works CDR, the Seller may submit to the Buyer for approval a revised FOP in accordance with the process for Change Orders set forth in Clause 6.4. In the event that the Seller does not submit such a revision or if the Parties are unable to agree upon the revised FOP, then the FOP attached as Annex C to Schedule 4 as at Variation Date 02 shall remain in place. Once the Parties successfully complete Replacement Works CDR in accordance with Schedule 14, then Seller shall proceed to material procurement as set forth in the VA Gantt Chart.

…

3. Installation of the Plant

Following delivery of the Plant, the Seller shall supervise the installation of the Plant at the Site. The Buyer shall be responsible for providing appropriately skilled personnel to undertake the installation.

4. Commissioning the Plant and Testing

4.1 Following installation of the Plant at the Site, the Parties shall undertake Commissioning. Seller shall supervise Commissioning and both the Seller and Buyer will provide adequate resources to ensure its timely completion. On completion of Commissioning, the Seller and Buyer shall, without undue delay, undertake Start Up.

…

4.3 On successful completion of the Preliminary Acceptance Test, the Parties shall issue the Preliminary Acceptance Certificate in accordance with Schedule 5 following which the Seller and Buyer shall undertake the Final Acceptance Test.

4.4 On successful completion of the Final Acceptance Test, the Parties shall issue the Final Acceptance Certificate in accordance with Schedule 6.
…

5. Obligations of the Buyer

5.1 The Buyer shall provide the Seller with appropriate access to the Site for the purpose of the Seller carrying out its obligations pursuant to this Contract.

5.2 The Buyer shall provide to the Seller the amount of feedstock necessary to perform required Commissioning and testing at required feed rates. The feedstock will have physical characteristics and composition similar to and within the expected range of variability of the feedstock set out in the Proposal. The Buyer shall also provide all services, facilities, materials and labour necessary to enable the Seller to undertake all tests and operation procedures outlined in the VA Gantt Chart.
…

9. Warranties

9.1 (a) Subject to Clause 9.5 below, the Seller warrants that the Plant supplied by the Seller conforms to this Contract and Proposal and shall be new, free from defects and shall, judged by prudent international industry standards, be of good workmanship and materials and, under normal operation conditions, shall show no defect due to engineering, design, fabrication, materials or workmanship.

(b) The Seller warrants that all the services rendered by the Seller shall conform with this Contract and shall be, judged by prudent international industry standards, consistent with good technical service practice. The Seller shall correct defects or failure caused by the breach of this warranty. The claims under this warranty need to be made in writing to the Seller within one (1) month after having been discovered.

9.2 The Seller's obligations under the warranties in Clause 9.1 (a) shall be effective for two years following issuance of the Final Acceptance Certificate but in no case longer than thirty six (36) months after Replacement Equipment delivery to the Site (hereinafter referred to as "Warranty Period")….
…

9.5 The Seller shall not be responsible and these warranties shall not apply if the Equipment or Replacement Equipment has been subjected to any of the following occurrences and such occurrence directly contributed to the failure of the Equipment or Replacement Equipment to be in compliance with the warranty:

(a) Incorrect or negligent operations or improper maintenance in violation of normal operating procedures provided by Seller to Buyer.

(b) alterations made otherwise than by or with the written consent of the Seller or as set forth in this Contract.

(c) defects attributable to the Plant not being properly maintained or operated under normal operating conditions by or on behalf of the Buyer by any person other than the Seller.

(d) fair wear and tear or where otherwise the relevant part or parts of the Equipment or Replacement Equipment has been consumed or worn out in normal operating procedures provided by Seller to Buyer.

…

10. Contract Price, Replacement Works Price and Payment Terms

10.1 The Buyer shall pay the Seller the Contract Price and the Replacement Works Price in consideration of the Seller's obligations under this Contract, in accordance with the Payment Terms and Milestones set out in the Phase II Contract Particulars. …

10.2 If the Buyer fails to make payment of any amount due to the Seller within 5 days of the date for payment of that amount the Seller shall be entitled to receive interest on that amount at the rate of 5% per annum above the base rate of the Bank of England.

10.3 Buyer has heretofore established a bank account (the "Project Bank Account"), disbursements from which will be subject to the Project Bank Account Disbursing Agreement. As of Variation Date 02, the balance in such account is not less than £1,716,000. Payments will be made to Seller on the terms and subject to the conditions set forth herein and in the Project Bank Account Disbursing Agreement.

10.4 Seller has heretofore obtained an Advance Payment Bond for the benefit of Buyer, which bond has an expiration date of 30 September 2016.

10A Contract Security

The Seller shall use reasonable efforts to extend the duration of the Advance Payment Bond in the reduced amount of £3,080,000 to successful completion of FAT. In the event that Seller is unable, despite 'reasonable efforts, to so extend

the duration of the Advance Payment Bond to successful completion of FAT, then either (i) Seller shall provide an alternative form of security reasonably acceptable to Buyer in the amount of £3,080,000 (any such alternative security approved by Buyer in accordance with this Clause 1 0A is hereinafter referred to as "Alternative Security"), or (ii) Seller shall provide an Alternative Security in the amount of £1,400,000 and all payments owed by Buyer to Seller hereunder shall be delayed until successful completion of FAT. Following installation, the Parties may, by mutual agreement, determine to reduce the amount of the Advance Payment Bond and/or Alternative Security.

…

10C Variation Agreement Gantt Chart

Prior to the completion of the Replacement Works CDR, the Seller may submit to the Buyer for approval a revised VA Gantt Chart in accordance with the process for Change Orders set forth in Clause 6.4. In the event that the Seller does not submit such a revision or if the Parties are unable to agree upon the revised VA Gantt Chart, then the VA Gantt Chart attached hereto as Schedule 7 shall remain in place.

…

13. Confidentiality

13.1 Subject to Clause 13.2 the Parties shall keep confidential all the Confidential Information received by one Party from the other Party relating to this Contract and shall use all reasonable endeavours to prevent their employees, subcontractors, Associated Company, and agents from making any disclosure to any third party of any Confidential Information.

13.2 The obligation in Clause 13.1 shall not apply to:

(b) [*sic*] any disclosure of information that is reasonably required by any Party in the performance of its obligations under this Contract for the performance of those obligations;

(c) any matter which a Party can demonstrate is already or becomes generally available and in the public domain otherwise than as a result of a breach of this Clause 13;

…

(e) any disclosure of information that is reasonably required to be made by either Party to its insurers and/or professional advisors.

…

14. Insurance and Indemnification

14.1 The Seller shall at its own expense procure and maintain and comply with conditions of a professional indemnity insurance policy for the duration of this Contract until the end of the Warranty Period indemnifying the Buyer for any claim which it may become legally liable to pay because of claims arising out of the performance of the professional engineering in connection with this Contract. Each claim and aggregate limit shall not be less than the Contract Price. The premium for this professional indemnity insurance will be borne by the Seller. The same applies for the retained liabilities for each and every loss.

…

14.4 The Seller will provide to the Buyer insurance certificates documenting coverage for professional indemnity insurance as specified in Clause 14.1 and commercial general liability insurance including products liability insurance as specified in Clause 14.5. The Seller is required to notify the Buyer as soon as it becomes aware of the termination, non-renewal or modification for the disadvantage of the Buyer of any policy of insurance. Certificates shall be provided no later than thirty (30) days after the effective date of the insurance policy, except in the case of the defects coverage which shall be provided no later than thirty (30) days prior to transfer of risk to the Buyer

.

14.5 Seller shall maintain, and provide evidence of, product liability insurance being part of the commercial general liability and commercial umbrella in the amount of at least $10 million USD. Such limit shall be provided under the commercial general liability and commercial umbrella. This limit is not considered to be a limitation of any liability assessed.

…

14.9 If any insurance required under this Contract is cancelled for any reason whatsoever, including nonpayment of premium or any substantial change is made which affects the interests of the Buyer, and/or the Seller, such cancellation or change shall not be effective as to the affected Party respectively for thirty (30) days after receipt by such Party of written notice sent by registered mail.

17. TERMINATION

17.1 If an Event of Insolvency occurs in relation to the Seller then the Buyer may at its option terminate this Contract.

17.2 If the Seller:

(a) Abandons or unreasonably suspends performance of the Contract requirements without reasonable excuse for a period of thirty (30) days;

(b) Is otherwise in breach of any of its material obligations under this Contract;

(c) does not issue a Preliminary Acceptance Certificate pursuant to clause 11.2(b) (subject to the exercise of 11.2(e)); or

(d) does not issue a Final Acceptance Certificate pursuant to clause 11.3(c) (subject to the exercise of 11.3(e)), then the Seller shall, within thirty (30) days of receipt from the Buyer of notice of default under this Clause 17.2, correct or cause to be corrected such default or make or cause to be made provision satisfactory to the Buyer for correcting such default within a reasonable time thereafter, failing which the Buyer may at its option terminate this Contract.

17.3 Upon any termination pursuant to Clause 17.1 or 17.2 the Buyer may, as a remedy:

(a) Subject only to making payment to the Seller of any amount equal to the aggregate cost of all Equipment on Site, together with the value of engineering and design, as reasonably determined by the Buyer and the Seller less the aggregate of all amounts previously paid by the Buyer to the Seller in accordance with Schedule 1, take possession of all Equipment located at the Seller's facilities or the facilities of any supplier or any other supplier or subcontractor, whether or not such Equipment is in a deliverable state; or

(c)(*sic*) Draw the full amount of the incurred damages from any outstanding Advance Payment Bond, to the extent that the Buyer has incurred damages due to such termination and such damages are not covered under other rights exercised by the Buyer. In the event that the Buyer intends to draw on any Advance Payment Bond due to a termination the Seller shall have the opportunity, but in no case longer than thirty (30) days, to provide evidence to the Buyer of its ability to continue to perform its obligations under this Contract. If the Buyer determines in its reasonable discretion that the Seller is able to perform its obligations under this Contract in the manner initially anticipated by the Buyer the Buyer agrees to abstain from making the draw until and unless the Seller fails to perform its obligations under this Contract.

17.4 If an Event of Insolvency occurs in relation to the Buyer then the Seller may at its option terminate this Contract.

17.5 If the Buyer is in breach of its material obligations under this Contract and has not cured this breach within thirty (30) days upon written notice by Seller, then Seller may, at its option, terminate this Contract.

17.6 Upon any termination by Seller pursuant to clause 17.4 of this Contract, the Seller shall have all rights available to it at law and in equity.

…

108. Schedule 2 to Schedule A to Variation 02, entitled "Phase II Contract Particulars" describes when payments are to be made by BlueOak to Tetronics in respect of the "Contract Price" and the "Replacement Contract Price" as follows:

Contract Price; Replacement Works Price

The Contract Price is defined in Schedule 3. The Replacement Works Price is $4,999,860; the Replacement Works Price is denominated and payable in USD.

Payment Terms and Milestones - Contract Price

£2,500,000 - on commencement of Phase II.

£1,940,250 -Against shipping agent's confirmed receipt of goods ready for shipment. Release of shipper's multimodal bill of lading will not be released until confirmed payment.

£713,500 - Upon issuance of the Start Up Test Certificate in accordance with Schedule 4A following successful SUT.

£293,500 - upon issuance of the Start Up Test: Second Pass Certificate in accordance with Schedule 4B following successful SUT 2.

£420,000 - By means of payments in accordance with the Clause 10.1(a).

£709,000 - Upon issuance of the FA Certificate in accordance with Schedule 6 following successful FAT.

Payment Terms and Milestones - Replacement Works Price

$3,000,000 upon Variation Date 02.

$1,000,000 - upon completion of the Replacement Works CDR.

$999,860 - upon completion of Commissioning of Plant.

109. Of the $4,999,860.00 Replacement Works Price, Tetronics was paid $4,731,848.00, with the remaining $268,012.00 reflecting liquidated damages paid to BlueOak for delivery delays and costs incurred by BlueOak with respect to the First System. [CWS69 (Rumbol) ¶31]

(F) Design of the Second System

110. Some of the equipment originally supplied under the FEED & Supply Contract was retained for use with the Second System. Variation 02 reflected the need for equipment to replace the equipment damaged by the insured event. The Second System also was to include design modifications to mitigate the risk of another furnace failure and to address some issues that had been encountered when commissioning the First System. [CWS134 (Rumbol) ¶5; CWS136 (Deegan) ¶6; CX-029]

111. As had occurred with the First System, the design process for the Second System included a Preliminary Design Review (**PDR**) and a Critical Design Review (**CDR**). During the PDR phase, representatives of Tetronics and BlueOak met with representatives of BlueOak on 21 April 2016 and presented the preliminary designs. Robert Foster and Ahab Garas of BlueOak were at the PDR meetings and were accompanied by BlueOak's outside consultants and sub-contractors. [CX-024; CX-029; CWS70 (First Witness Statement of Matthew Powell) ¶21]

112. On 20 May 2016 Foster, on behalf of BlueOak, executed a PDR Acceptance Certificate stating that "BOA confirms completeness with the understanding that all action items documented in the … PDR Meeting Minutes are fully executed." [CX-023; CWS70 (Powell) ¶20]

113. The CDR meeting took place on 9-10 June 2016 with substantially the same attendees. Tetronics made a presentation of the final design and engineering plans. Tetronics presented various documents before and during the CDR meeting. On 10 June 2016 Foster signed a CDR Acceptance Certificate stating "We, the undersigned, agree that the Critical Design Review (CDR) has been successfully achieved and Concept design accepted to allow progress towards detailed design and Manufacture, whilst addressing any actions published in the attached meeting minutes." [RX-009; CX-025,-035; CWS70 (Powell) ¶22]

(G) Consideration of a TBRC

114. The evidence shows that BlueOak had been considering whether to install a top-blown rotary converter (**TBRC**) between the furnace and the granulator. The purpose of the TBRC was to heat and further refine the alloy after it was tapped from Tetronics' furnace, but before it was poured into the granulator. In connection with the possible acquisition of a TBRC, in late October 2016 BlueOak asked Tetronics to analyze whether the waste product generated by the operation of the TBRC (called 'Fayalite slag') could be recycled and then fed into the plasma arc furnace. Tetronics provided a quote to BlueOak to study that issue. BlueOak responded on 10 March 2017 that it found the quote unacceptable and said "we will proceed on our own." The evidence shows that no TBRC was ever installed. The possible acquisition of a TBRC was revisited by BlueOak in mid-2018. [CX-139,-140; [TR Day 6 (Foster) pp. 140-144]

(H) Summary of Intended Operation of the Second System

115. On 4 May 2017, about a year after the CDR, Tetronics sent BlueOak an "Operation and Maintenance Manual" for the Second System (**OM Manual**). The OM Manual provides a useful summary of the intended operation of the Second System. [RX-024]

116. The "System and Process Description" section of the OM Manual states that the System "is designed for the treatment of raw or non-pre-treated electronic waste (e-waste), assumed to be mainly of printed circuit board (PCB) waste form and quality." The section notes that there is what are called first and second "passes" of material through the furnace. The "first pass" involves only e-waste being introduced to the furnace. The OM Manual states before being fed into the furnace the e-waste is to be shredded "to an average diameter of 50 mm." Coils of wires, referred to as 'stringers' are to be removed or reduced in length. The shredded e-waste is then "transferred to the blend formulation system, where the e-waste is blended at ground level with fluxing agents (lime and main tap slag)." [RX-024]

117. Once the blended e-waste is fed into the furnace, the OM Manual states that the furnace will gasify the organic material and funnel the resulting hot off-gas through the off-gas system. There, a thermal oxidizer converts carbon monoxide to carbon dioxide and then cools the gas. The gas then is fed through filters that separate dust particles. Lime is injected into the gas to neutralize harmful toxins before releasing the gas into the atmosphere. "[D]usts recovered in the various off-gas systems units

are pneumatically transported to heated silos … where they are stored until they get recycled and fed through the furnace [the '**Second Pass**'] in order to recover the Precious Metals (**PMs**), most notably silver … contained within the dust ….” [RX-024]

118. The OM Manual describes what occurs inside the furnace as the contents are heated to their 'liquidus' temperatures using the suspended electrodes: [RX-024]

> Most of the inorganics and metals form a melt pool (liquidus/molten pool of mixed material), which consist of two distinct, separate phases i.e. an upper molten layer of slag, composed mostly of metaloxides (metals with high reducing potentials), and a lower, free copper/iron based, metallic alloy layer (metals with a low reducing potential for other species) containing the majority of the PMs. There is a non-destinct [*sic*] transitional layer/mass transfer region between the slag and alloy layer. During the smelting, the low reducing potential metallic constituents of the feed get reduced or stay bright (metallic) and form molten micro-droplets, which percolate through the top slag layer, scrubbing the PMs into the collector metal layer … The collector metal layer accumulates in the base of the furnace. The plasma power input is adjusted by the End User, to ensure a constant melt temperature of around 1500°C to 1700°C with the target being 1600°C.
>
> … The metal alloy is only tapped intermittently from the main tap hole, once sufficient metal volume has accumulated in the furnace hearth….

(I) Installation of the Second System

119. Tetronics ordered parts and equipment for the Second System. These were shipped to BlueOak's Facility in Arkansas. A team from Tetronics went to Arkansas in December, 2016 to assemble the furnace and to supervise installation. [CWS70 (Powell) ¶26]

120. The VA Gantt Chart called for equipment installation to be completed by 9 December 2016. The next step in the intended process after the equipment was installed was commissioning, leading to a formal start up test (**SUT –** comprised of **SUT 1** for the First Pass and **SUT 2** for the Second Pass) supervised by Tetronics' staff. After startup the system was to be operated by BlueOak for a period of time before conducting a final acceptance test (**FAT**). [CWS70 (Powell) ¶27]

121. Installation of the equipment was not completed until April 2017. This gave rise to a liquidated damage claim by BlueOak against Tetronics of approximately $250,000.00. The next milestone payment to Tetronics was not due until SUT had

been completed. As a result of the delays, Tetronics asked that the payment be made early, deducting the amount claimed by BlueOak as liquidated damages. On 15 March 2017 BlueOak and Tetronics agreed that certain funds held in an escrow account subject to their joint signatures be disbursed, with $751,173.00 being paid to Tetronics and $249,993.00 being paid to BlueOak. [CWS134 (Rumbol) ¶11; CX-138]

(J) Delays in Commissioning of the Second System (June-October 2017)

122. After equipment installation was complete Tetronics began the commissioning process. The parties disagree about some of what occurred in the course of Tetronics' efforts to complete commissioning. There is no dispute that Tetronics did not ever achieve SUT or FAT. A significant area of controversy in this arbitration concerns which of the parties is responsible for these failures. To the extent necessary, the details of the arguments and evidence underpinning the parties' positions with respect to these matters will be discussed as part of the Analysis.

123. A general statement of Tetronics' position is articulated by, among others, David Deegan, Tetronics' Chief Technical Officer. Deegan states that Tetronics' efforts to achieve commissioning and complete SUT and FAT were frustrated and delayed by BlueOak's actions, including: [CWS71 (Deegan) ¶¶7,17-25]

    a. providing feed material with a physical and chemical composition that did not comply with Contract specifications;

    b. BlueOak's demands that were, in his view, outside of the Contract specifications, including a demand that no alloy be tapped unless the alloy reached a temperature of 1550°C-1600°C within the furnace; and

    c. poor maintenance of the System and operational errors by BlueOak.

124. John Conway, Tetronics' Head of Project Management, states: [CWS72 (First Witness Statement of John Conway) ¶¶45-47]

> 45. … the greatest delays came from the impacts of site power outages, critical data communication network interferences and most significantly, the inconsistency of the feed supplied by BlueOak and BlueOak's insistence that they would not allow the furnace to be tapped unless the internal alloy temperature was 1600°C.

125. Tetronics contends that the various disruptions they describe often resulted in the furnace operation being shut down and then restarted, causing a significant delay because the furnace must be brought back up to temperature. [CWS71 (Deegan) ¶7; CWS135 (Powell) ¶¶8-15]

126. BlueOak's general position is articulated by, among others, Foster, who was Chief Operating Officer of BlueOak from January 2015 to June 2018. Foster states that between June and October 2017, Tetronics was in *de facto* control of the plant, supervising BlueOak personnel. He states that during this period: [RWS4 (Foster) ¶¶33-38, 42-70]

    a. there were more than fifteen serious incidents that could have caused a debilitating injury or death and more than fifty other incidents regarding shutdowns or safety issues;

    b. repeated shutdowns of the furnace and the inability of the furnace to maintain heat caused the metal alloy to cool and "freeze" within the furnace so that it could not be "tapped";

    c. the entire System was shut down on multiple occasions due to blockages in the off-gas system, including the dust conveyor system, the candle filter, and the thermal oxidizer conveyors;

    d. the electrodes constantly broke off and defective electrode seals allowed carbon monoxide and other poisonous gas to be released into the Facility and the atmosphere;

    e. water cooling system nozzles leaked water into the furnace creating a risk of explosion; and

    f. the furnace was not able to heat the metal alloy to the required temperature which in his view is 1600°C, determined by finding the alloy's liquidus point and adding the amount of "superheat" required to offset the heat loss sustained when transporting the alloy from the tap-hole to the granulator.

(K) The Granulator and the Requirement for a Minimum Tapping Temperature

127. BlueOak hired Economy Industrial in the spring of 2015 to design a granulator and a granulation process. Molten alloy was to be tapped from the furnace into a ladle and transported in the ladle "downstream," across the Facility to the granulator, where the ladle would be 'tilted' to deposit the alloy for granulation. Kevin Morrow of Economy Industrial designed the metal flow from the ladle tilter to the granulator. [RWS11 (Witness Statement of Kevin Morrow) ¶4]

128. Morrow's evidence is that "[t]o be successfully granulated, the alloy needed to enter the granulator at as close to 1450°C as possible, or higher." He recommended to BlueOak that the alloy temperature at the time of tapping needed to be approximately 1550-1600°C. If the alloy is tapped from the furnace at 1600°C, Morrow's evidence is that it is still able to withstand cooling by up to 100-150°C as it is transported to the granulator. [RWS11 (Morrow) ¶6]

129. Morrow's evidence is that typical alloy transport times from a melting furnace to downstream processing are eight to ten minutes in a sophisticated smelting facility. BlueOak's alloy transport time was approximately twelve minutes. Morrow advised BlueOak that if the ladle was pre-heated to 1090°C, the alloy temperature would decrease by approximately 60-70°C during the transport process. His evidence is that If the furnace superheated the alloy to 1600°C, the alloy would only cool down 60-70℃ during the transport process and would be "well within the optimal temperature for granulation." [RWS11 (Morrow) ¶¶4-7]

130. There are disputes between the parties concerning what Tetronics knew or ought to have known about the temperature requirements for granulation, when any such information was acquired by Tetronics, whether Tetronics' design ought to have accounted for those requirements and whether under the Contract Tetronics had promised that the Second System would produce molten alloy at the tap-hole at a temperature of 1600°C. The conflicting evidence and submissions on these subjects are discussed as part of the Analysis.

131. The evidence clearly establishes that commencing in May or June 2017 BlueOak, primarily through Foster, insisted that the furnace not be tapped unless the temperature of the alloy reached 1600°C. In late July 2017 BlueOak agreed to reduce the minimum tapping temperature to 1550°C. [CWS72 (Conway) ¶¶46, 49-51; CWS70 (Powell) ¶¶33-37; CWS135 (Second Witness Statement of Matthew

Powell) ¶¶8,9; CX-075; RWS5 (Foster) ¶25] The evidence shows that Foster and other BlueOak personnel stated that the minimum tapping temperature requirement was for the purpose of making the alloy hot enough for BlueOak to granulate the alloy. [CWS187 (Second Witness Statement of John Conway) ¶9]

132. In addition to the minimum tapping temperature demanded by BlueOak, Tetronics' operating procedures did not permit tapping until the depth of the molten alloy layer within the furnace reached at least 12 inches. [TR Day 6 (Foster) pp. 254-257]

133. Between June and October2017 the molten alloy was tapped only 11 times. This limited amount of tapping was not sufficient for Tetronics to meet the throughput requirements for SUT or FAT. [TR Day 3 (Deegan) pp 357-258]

134. Tetronics' internal and external correspondence shows that achieving the desired tapping temperature was a major focus of Tetronics' commissioning efforts until October 2017. [RX-070,-071,-073] In August 2017 Tetronics decided to submerge the electrode into the melt pool "in order to improve penetration of the heat into the alloy."[RX-071,-093] By early October 2017, however, Tetronics had not been successful in consistently achieving the targeted alloy temperature of 1550℃. [RX-093]

(L) Delays Unrelated to the Minimum Tapping Temperature (June-October 2017)

135. On 3 July 2017 Foster wrote to Deegan noting the slow progress in commissioning, as only five lots had been tapped and granulated. He outlined a number of "design issues" which he said required immediate attention "in order to complete Hot Commissioning." The list included: [RX-037]

    a. Dust build-up in the off-gas system which he considered was attributable to the pneumatic dust conveyor system used to convey dust from the off-gas system to the feeder system for "Second Pass" processing;

    b. A defective feed system slide gate which failed to prevent backflow of process gas into the feed system resulting in an explosion and a fire;

    c. Inadequate lime injection in the off-gas system, because the lime feeder did not feed consistently and required operator assistance;

d. The thermal oxidizer continued to 'trip' shutdowns of the furnace due to "numerous issues" relating to the oxidizer;

e. Furnace burner capacity inhibited the restart capability of the furnace and Tetronics' "workarounds" using rebar or railroad steel to kickstart the plasma arc after each shutdown were dangerous and ineffective; and

f. Water/oxygen injectors in the off-gas system inhibited efforts to heat the alloy because they only "performed at their functional capacity" when the furnace was at "half of the design capacity" and also caused steam explosions because of leaks inside the furnace.

136. On 11 August 2017 Foster sent a letter to Powell, reporting damage to the refractory caused by Tetronics' increase of the slag levels inside the furnace to coat the coolers and reduce heat losses. Foster noted that this practice ran contrary to what Tetronics initially included in its "O&M Manual" and "[w]hile the practice was successful in reducing the losses," the procedure resulted in significant wear to the refractory block and the water - cooled nesting block. [RX-031]

137. Another issue that arose during commissioning was that the electrode seals permitted electricity to arc out of the furnace, causing 'side-arc' events in which the plasma arc would come out of the furnace and onto the nearby platform like a bolt of lightning. Three such events in September 2017 caused safety concerns and plant shutdowns. [RX-012,016,038,107; CX-094,097] At a 27 September 2017 meeting Tetronics and BlueOak agreed that wear of the electrode seal was a contributing factor. Tetronics agreed to purchase upgraded electrode seals. [RX-096]

138. On 17 August 2017, Garas told Rumbol that he would "not permit any new material to be fed in to the furnace unless [the parties] have an acceptable interim solution in place" regarding the "remov[al] [of] dust from the Off-gas system" that routinely caused blockages and shut down the System. Rumbol acknowledged the issue and proposed a "path forward." Tetronics offered to "pause the hot commissioning to develop and implement the permanent fix to the Off-gas dust conveyor system." Rumbol proposed that "[d]uring this pause [Tetronics'] team will return to the UK and will return as soon as we have installed a permanent fix to the Off-gas dust conveyor." [RX-013]

(M) Tetronics' October 2017 Demobilization and Planned Upgrades

139. Tetronics planned to demobilize its commissioning efforts at the Facility and return to England on 13 October 2017 to conduct further diligence in order to fix the design and engineering issues with the Second System. [CX-115] BlueOak was aware of and approved Tetronics' departure on 13 October 2017. The plant was shut down to perform routine maintenance, including a re-lining of the furnace. [CWS71 (Deegan) ¶¶10, 11]

140. On 10 October 2017, Deegan sent an e-mail to BlueOak that attached a presentation on engineering updates Tetronics planned to undertake "to improve or correct operability" of the Second System. [CX-062] Deegan stated that '[w]e provide this presentation to inform BOA of our intention, seek their approval to proceed and also to allow Tetronics, on this basis, to commit to purchases with its supply chain." The attached presentation included plans for (i) an "Electrode Seal Upgrade" that could better withstand the operating temperatures of the furnace; (ii) a "New Hydrated Lime Feeder" for the off-gas system; (iii) a "Thermal Oxidiser Burner Upgrade" for the off-gas system; (iv) proposed fixes to the pneumatic dust conveying system in the off-gas system; and (v) a "Feed Chute Modification" to the feeder system. [CX-011]

141. On 11 October 2017 the parties met to discuss Tetronics' presentation. Deegan then sent an e-mail memorializing the meeting and noting that BlueOak approved the fixes that Tetronics proposed and authorized Tetronics to proceed, except for the fixes to the pneumatic dust collection component of the off-gas system. BlueOak requested a mechanical dust collection component to be added. Tetronics committed to take this up with its external engineering consultants (**STB**) to determine what was possible to improve BlueOak's confidence in the methodology proposed by Tetronics. [CX-011]

142. On 17 October 2017 Rumbol wrote to Garas as follows: [RX-003]

> As part of the due diligence we need to perform to provide assurances to our bond providers I have determined that we have a differing view of our contractual obligations concerning the alloy tap temp. I believe the BOA position is it must be 1600 Deg. C, reduced to 1550 Deg. C on a concession.
>
> It is now clear to me that the contractual position is different.

- Annex 10 to Variation 02 is the FOP which states that the furnace operating temp is 1600 Deg. C, which it is and we comply with. It does not state the alloy temp should be 1600 Deg. C (See attached)

- The FOP was reviewed and accepted at CDR (See attached) this also states the furnace operating temp is 1600 Deg. C, which it is and we comply with. It does not state the alloy temp should be 1600 Deg. C.

- The CDR information pack included a document called Projected Composition of Molten Products – recovery of metals from E-waste 856-1028-05-TD006-R02 (See attached). This document clearly states that the 1st and second pass slags will be 1600 Deg. C and the 1st and second pass Alloy temps will be 1470-1530 Deg. C. A furnace with slag at 1600 and alloy at 1470-1530, would be operating at c1600 Deg. C to deliver the slag temp and be in accordance with the FOP.

We seem to have spent enormous amounts of time trying to achieve a BOA requested Alloy temp that is not a contractual requirement. As a consequence, I believe we are much closer to achieving the required contractual performance from the furnace. For clarity Tetronics does not have a contractual obligation to achieve an alloy temp of 1600 Deg. C.

(N) Hatch Reports, Issuance of HSBC Bond and BlueOak's Default Notice (October to December 2017)

143. Tetronics agreed that during its temporary absence from the site beginning on 13 October 2017 BlueOak could continue operating the furnace, but at a reduced capacity. Tetronics contends that during this time BlueOak operated the furnace outside of the agreed operating parameters, and made modifications to the furnace that were not approved by Tetronics. [CWS72 (Conway) ¶11; CWS70 (Powell) ¶77; CWS71 (Deegan) ¶¶12, 22; CX-043]

144. BlueOak had engaged the engineering firm Hatch Associates Consultants (**Hatch**) as one of its advisors in approximately April 2017. After entering into a 21 August 2017 non-disclosure agreement (**Hatch NDA**) on 21 September 2017 BlueOak specifically engaged Hatch "to assess the furnace operation (i.e., whether furnace could heat the metal alloy to 1600°C), provide an opinion of the causes of cold alloy and offer potential solutions, and subsequently to assess the current design and performance of the off-gas system … delivered to BlueOak by [Tetronics]." [RWS007 (First Witness Statement of Daan Sauter) ¶¶2-5] If Hatch found any issues, Garas asked Hatch to indicate whether such issues could be remedied, and if so, how. Garas

asked Hatch not to limit any potential remedy based on monetary restraints. Hatch was not asked to opine on BlueOak's or Tetronics' contractual performance. [RWS008 (Second Witness Statement of Daan Sauter) ¶8; RX-077; CX-190]

145. In early October 2017 Hatch deployed a team headed by its Project Manager, Daan Sauter, to inspect the Second System. On 5 October 2017 Hatch made a PowerPoint presentation to BlueOak. [CX-080] In relation to the "cold alloy" issue, it stated:

- Furnace is unable to systematically heat the alloy to the target temperature of > 1550°C
    - In furnace design it is more typical to minimize alloy superheat for furnace integrity reasons

- However the alloy bath is typically fully molten and hence can be tapped at current temperatures (> 1300°C)
    - Depending on Cu: Fe ratio

- Key recommendation is to separate melting and phase separation (furnace) from final heating to meet granulation temperature (ladle)
    - Use the chemical heating value in the alloy

146. BlueOak received substantial drafts of two reports dated 1 November 2017. One Report was a "Cold Alloy Assessment" authored primarily by Sauter. The other was a "Furnace Off-Gas Review" authored primarily by others at Hatch. [CX-190,191]

147. Contemporaneously with Hatch's work, Tetronics and BlueOak were in communication about the replacement of the Advanced Payment Bond that had been issued in accordance with the FEED & Supply Contract, but which expired on 30 June 2017. Variation 02 required Tetronics to use reasonable efforts to extend the duration of the Advance Payment Bond or other security until successful completion of the FAT. [RX-001, Schedule 3, §10A]

148. Tetronics had asked HSBC to issue a new bond (**HSBC Bond**). As a precondition to its issuance of the HSBC Bond, HSBC required Tetronics to obtain an assurance from BlueOak in a form acceptable to HSBC that would give HSBC comfort that there would not be an immediate call on the HSBC Bond once it was issued (**Comfort Letter**). [CWS69 (Rumbol) ¶33] Discussions and written exchanges between Garas of BlueOak and Rumbol of Tetronics about a form of Comfort Letter had begun in late October and continued through early November. Garas and Rumbol also discussed a proposal by Tetronics that (i) pending issuance of the HSBC Bond

BlueOak would directly pay Tetronics suppliers for the "agreed engineering enhancements" that Tetronics was working on in England and (ii) once the HSBC Bond was issued BlueOak would make a payment of £850,000-900,000 to Tetronics and (iii) any advances made by BlueOak to Tetronics' suppliers would be deducted from the payment due to Tetronics on completion of FAT. [CX-082; RWS3 (Garas) 9-24; CWS142 (Rumbol) ¶7; CWS69 (Rumbol) ¶¶30-37; RX-086]

149. BlueOak signed and delivered the final form of Comfort letter dated 13 November 2017. It was a revised version of earlier drafts and had been approved by HSBC. It was addressed to Tetronics and stated: [RX-082; CX-012]

> In support of Tetronics efforts to secure the required contract security defined in clause 10A (Schedule 3) of the conditions of variation agreement 02. BlueOak Arkansas LLC confirm the following:
>
> 1. As far as we are aware there are no current circumstances that would give rise to a demand for breach of the underlying supply contract on the assumption that the previous Guarantee were still in place.
>
> 2. We agree to the wording of the guarantee as defined by the attached draft (Guarantee wording reference 31055).
>
> 3. We agree to the proposed Guarantee expiration date of the 19th of January 2018.

150. The evidence of Garas is that "at that time, BlueOak had no intention of immediately drawing on the bond." He states: [RWS3 ¶19]

> 19. This is true even though, by November 2017, it was obvious to both parties that the furnace was not going to operate as contractually-contemplated without modification. This was well known and obvious given that no operating project milestones had been achieved. In October 2017, Tetronics had returned back to England to brainstorm solutions with its entire team. BlueOak was patiently waiting to see what solutions Tetronics would propose to remedy the errors, while also trying to work through some solutions on their own. In fact, BlueOak engaged Hatch Ltd. ("Hatch") for this very purpose. Hatch was hired to flag key issues and propose solutions in order to make the Osceola facility profitable. Hatch was not brought on to evaluate either parties' contractual performance.

151. On 21 November 2017 HSBC issued the HSBC Bond in the amount of £3,080,000.00. [CX-074]

152. On 29 November 2017, Tetronics sent to BlueOak a package of information reporting on steps taken to implement agreed fixes and to give confidence to BlueOak that proposed fixes to the pneumatic dust conveyor system would work without having to replace it with a mechanical system. The attached presentation: [CX-038]

    a. confirmed that the electrode seal upgrade had been completed;

    b. reported that a loaned upgraded lime feeder unit was currently being installed on site and that a new replacement unit would be delivered in January 2018;

    c. reported that the new thermal oxidizer burner upgrade equipment was due on site in late December 2017 and would be installed in January 2018;

    d. with respect to the dust conveyor system, reported that STB had developed a revised solution, that design review would be completed at the end of the week, and that equipment orders had been placed; and

    e. reported that the feed chute modifications would be complete by Christmas, 2017.

153. The parties met on 30 November 2017 to discuss the engineering fixes Tetronics proposed to implement and a revised Gantt Chart setting out the implementation schedule. [CX-038]

154. The final versions of Hatch's Cold Alloy Assessment and the Furnace Off-Gas Review were delivered to BlueOak on 8 December 2017. [RTX-015,016] The stated purpose of the final Cold Alloy Assessment (**Final Hatch Cold Alloy Report**) was to determine "if the current system [defined as "PAF" or "Plasma Arc Furnace"] is able to achieve the operating parameters described in the PAF Furnace Operating Plan (**FOP**) and to, identify any design changes or modifications required in order to achieve the furnace operating plan (FOP) production rates and process flow diagram (PFD) parameters collectively referred to in this document as the FOP." The "overall conclusions" were summarized as follows: [RX-015]

> From a high-level summary perspective and as further documented in this report, Hatch's overall conclusion is that it is challenging to consistently reach the PAF FOP and continuing to do so will impact both production, furnace integrity and poses significant safety concerns. As such, Hatch recommend that the pursuit of 1600°C alloy temperature be abandoned and rather the temperature should be kept as low as possible, with the alloy superheated outside of the PAF. Together with the off-gas review … we have identified many design changes and modifications which are expected to result in BlueOak being able to track the FOP production rates, but without requiring the existing PAF to achieve the FOP targets, specifically the alloy temperature.

155. The final Furnace Off-Gas Review (**Final Hatch Off-Gas Report**) included Hatch's "assessment of the furnace gas systems with the focus of identifying priority upgrade recommendations based on an assessment of operating data, discussions with operators, and a physical review of the operation." The report identified short-term, medium-term, and long-term changes to the off-gas system that, combined, were estimated to cost $10-12 million, including many of the issues that BlueOak had previously identified to Tetronics. [RX-016]

156. On 11 December 2017, BlueOak issued a Notice of Default (**Default Notice**). The Default Notice stated that Tetronics had materially breached the Contract and that the plant supplied by Tetronics failed to conform to the warranty standards set out in the Contract. [CX-013; RX-004] The Default Notice stated: (in part)

> Earlier this month, BlueOak learned that the Plant fails to meet this standard on account of several serious design and other defects, including but not limited to:
>
> Design failures related to maintaining sufficient alloy temperatures, ensuring adequate thermal balance, managing slag overflow, sealing the graphite electrode, managing dust, effectively conducting carbon thermal oxidization and providing a safe work environment.
>
> Engineering and related failures related to furnace temperature excursions ineffective dust conveyors on the off-gas system, an oft-plugged lime feeder, inadequate control of the E-Waste LIW feeder, incompatible gas duct bolt-up flanges, inadequate components of the thermal oxidizer burner, failed weld seams on the E-Waste LIW bin, failed candle-filter components and furnace restart capabilities.
>
> …

> Further, given the amount of time and resources necessary to address the design and other defects with the Plant, the Contract Security presently in place—a guarantee that expires on January 19, 2018—is inadequate under Section I0A of the Agreement, which requires Tetronics to maintain security through FAT. BlueOak cannot envision a realistic scenario whereby the referenced defects are corrected and the Plant is possibly ready to successfully complete FAT prior to February 12, 2018—the earliest FAT could occur according to the most recent Gannt chart provided by Tetronics. The guarantee (or any other acceptable Alternative Security) must remain in place at least through this date in order for Tetronics to meet its obligations under Section 10A.
>
> BlueOak looks forward to receiving a plan from Tetronics to address the aforementioned defects and breaches. In light of the lengthy problems and delays with the Plant to date, as well as the terms of the Agreement, BlueOak must insist upon receiving such a plan no later than January 12, 2018.

157. On 17 December 2017, Tetronics responded in writing to the Default Notice. The letter asserted that the warranty provisions of clause 9.1 of the contract only applied during the warranty period. It outlined that there were only three improvements to be implemented during January 2018. It stated that many issues raised in the Default Notice had already been addressed and sought clarification in respect of two claims. [CX-047]

158. BlueOak responded on 26 December 2017, taking issue with many of Tetronics' assertions. BlueOak's letter stated: [CX-048]

> Tetronics needs to provide a written plan for remedying these defects in a diligent manner. Given that Tetronics denies that it has any current warranty obligations whatsoever, I am very concerned that such a plan will not be forthcoming.
>
> Moreover, although we disagree about many things, I trust we both recognize that the Plant is not on track to successfully pass FAT by January 19, 2018—the date that Tetronics' current security instrument is set to expire. To date, Tetronics has failed to address the deficient duration of its security arrangement—a material breach of Section 10A of the Agreement.
>
> Please advise me by January 2, 2018, as to whether Tetronics has reconsidered its position and will promptly take action to meet its obligations under the Agreement. Once Tetronics puts forth an acceptable action plan,

we can discuss a communications strategy moving forward that ensures the parties regularly discuss the status of Tetronics' remediation efforts.

159. With respect to the tapping temperature issue, the BlueOak letter stated: [CX-048]

> *1600° C Alloy Temperature*. You contend that the Plant can operate successfully with an alloy temperature substantially below 1600°C. As you know, this runs counter to the parties' understanding of the target alloy temperature throughout the entirety of the project. The critical design reviews, process flow diagrams, and operating manual for the furnace all make clear that 1600°C is the necessary target for this Plant to successfully (and safely) operate. Tetronics' recent decision to unilaterally lower the temperature target, is unacceptable.

160. Garas followed-up on his letter with an email to Rumbol dated 28 December 2019 expressing his personal hope, that "we will receive meaningful response with a go-forward game-plan that truly addresses all of the issues with the Plant." Garas suggested that in the meantime it would be premature for Tetronics to return to the site on 4 January 2018 as planned. [CX-046]

161. Tetronics responded to Garas' email and BlueOak's 26 December letter on 29 December 2017. The letter asserted that a denial of site access would be a breach of Variation 02. It attached the revised Gantt Chart discussed at the 30 November 2017 meeting reflecting the timetable to complete steps that had earlier been discussed. It addressed other issues raised by BlueOak. With respect to the tapping temperature issue it said: [CX-038; RX-018]

> The Furnace is designed and currently operates at 1600 Deg.C, meeting the required specifications. If BOA require the Plasma process to heat the alloy to a specific temperature that would require the furnace to operate above the 1600 Deg.0 to satisfy downstream processing equipment not within Tetronics scope of supply, then this will be a variation to the Contract and Tetronics would be happy to offer a proposal to do so, through the appropriate Contract Variation mechanism taking into account any cost, schedule and performance implications.

(O) Tetronics Returns to the Site and BlueOak Calls the HSBC Bond (January 2018)

162. On 2 January 2018 BlueOak attempted to make a call on the HSBC Bond by delivering to HSBC a letter alleging defaults by Tetronics under Variation 02. [CX-014]

163. On 4 January 2018 a Tetronics team arrived to begin implementing the works earlier discussed. On 5 January 2018 Powell sent an email to Garas to confirm discussions that had taken place the previous day. He attached a further revised Gantt Chart to incorporate new information provided by BlueOak regarding the completion of "a few tasks prior to Tetronics return to site." Powell made a formal request that the plant be shut down over a 48-hour period. Powell stated: [CX-165]

> The plan assumes this request will be granted immediately to allow the operators to shut the plant down over the weekend and start work on the equipment Monday 8th January 2018. The plant will be shut down for a period of approx. 13 days (assuming no delays) as some modifications can commence online after the fixes are complete. Tetronics will obviously try and expedite this period to minimise any delay in progressing back into hot commissioning and progressing into SUT as that is the joint objective.

164. The plant was shut down on 6 January 2018 and required two days to cool. [CWS69 (Rumbol) ¶¶59,60; CX-050]

165. On 6 January 2018, Garas sent an e-mail to Tetronics expressing concerns, *inter alia*, that Tetronics had "not properly planned-out nor staffed its efforts to remediate the few items [the parties] agree are in need of remediation." He did express his appreciation for the further revised Gantt Chart (**Final Gantt Chart**) provided the previous day. His only negative comment concerning the Final Gantt Chart was that it showed installation work ending on 25 January 2018 when the work was only going to take 13 days. The same day, Powell responded to each of Garas' comments. He explained that the Final Gantt Chart indicated 13 working days, but the actual time required was 17 days, which included two weekends when Tetronics would be working. [CX-050]

166. Tetronics' site team requested a report from BlueOak of activities and modifications by BlueOak since Tetronics left site on the 13 October 2017. [CX-051] BlueOak provided a report in response to the request. Tetronics concluded that the report was incomplete as it made no reference to a new oxygen burner system installed in place of the burner supplied by Tetronics. The report showed that Tetronics had modified the plant to accommodate the new burner, replacing a powered hoist with a mechanical dip probe hoist and removing three of the four oxygen and water injection nozzles used to control the furnace head space temperature. [CX-044]

167. On 10 January 2018 HSBC wrote to BlueOak stating that the documents presented by BlueOak were insufficient. On 11 January 2018 BlueOak submitted additional documents in support of its demand for payment under the HSBC Bond, including a certificate signed by Garas stating: [CX-014,039]

> On behalf of Blue0ak, I hereby certify that Tetronics is in breach of the supply contract in the following manner
>
> (1) Tetronics being in breach of its warranty obligations as set forth to Section 9.1(a) of Schedule 3 of the Variation Agreement 02 by failing to provide the Plant tree from material defects;
>
> (2) Tetronics being in breach of its warranty obligations as set forth in Section 9.1(b) of Schedule 3 of the Variation Agreement §12 by failing to provide services consistent with good technical service practice;
>
> (3) Tetronics being in breach of its obligations as set forth in Section 2.2 of Schedule 3 of the Variation Agreement 02 by failing to exercise reasonable: skill, care, and diligence in designing the Plant, and
>
> (4) Tetronics being in breach of its contract security obligations as set forth in Section 10A of Schedule 3 of the Variation Agreement 02 by failing to maintain security of an adequate duration.

168. Tetronics commenced court proceedings in England seeking to restrain payment under the HSBC Bond. It was not successful. This arbitration was commenced on 17 January 2018. As described in the Terms of Reference, on 2 February 2018 Tetronics submitted its **Emergency Measures Application** to the Secretariat. On 16 February 2018 the Emergency Arbitrator issued the **EA Order** rejecting the Emergency Measures Application. [TOR ¶¶46,47]

169. The sum of £3,080,000 was paid to BlueOak by HSBC.

(P) BlueOak Terminates the Contract

170. On 12 February 2018, BlueOak sent Tetronics an official notice of termination (**Termination Notice**). The Termination Notice states, in relevant part: [CX-015]

> On December 11, 2017, BlueOak sent Tetronics a written notice of Tetronics' material beaches of the Contract ("Breaches") and invited cure. Tetronics has failed to cure its Breaches and has further failed to present an acceptable plan for doing so. In addition, rather than curing the Breaches (including, but not

limited to, failure to provide a performance bond until the completion of successful Final Acceptance Testing), Tetronics ignored its legal obligations and instead initiated legal actions again BlueOak in the UK and in Paris to further avoid complying with its duties under the Contract and thereby unequivocally indicating it will not comply with its contractual duties and obligations.

Given the above, pursuant to Section 17, BlueOak is hereby terminating the Contract—effective immediately. BlueOak reserves all of its rights under the Contract and will pursue all available legal remedies for the Breaches, as well as any other breaches discovered during its continued investigation of Tetronics' failed performance under the Contract.

VII. THE PARTIES' CONTENTIONS AND THE AWARDS SOUGHT

171. The following summaries of contentions are not intended to exhaustively recite the detailed submissions and contentions of the parties, all of which have been taken into account by the Sole Arbitrator in performing his analysis and arriving at an award. For convenience, some citations are to the Post-Hearing Briefs, which in turn cite to the Memorials and evidence, all of which have been read and considered.

(A) Summary of Tetronics' Principal Contentions in Support of its Claims

(a) Lawfulness of BlueOak's Contract Termination

172. Tetronics contends that BlueOak unlawfully terminated the Contract because: [CPHB1 ¶¶224-228; CPHB2 ¶¶132-136]

a. Tetronics was not in material breach of its obligations as BlueOak contends; [CPHB1 ¶¶151,152; CPHB2 ¶57]

b. Alternatively, BlueOak's own conduct caused any breach, as result of which Tetronics' non-performance is excused under New York law; [CPHB1 ¶289] and

c. Alternatively, by virtue of BlueOak's acquiescence in Tetronics' continued efforts to remedy any breaches, BlueOak is equitably estopped from asserting that it did not accept Tetronics' remedial plan. [CPHB1 ¶¶208-223; CPHB2 ¶¶126-131]

173. Tetronics contends that, as BlueOak unlawfully terminated the Contract, it is liable to Tetronics for damages breach of contract. [CPHB1 ¶224]

(b) BlueOak's Alleged Breaches of the Contract Excuse Tetronics' Non-Performance

174. Tetronics acknowledges that it had not achieved commissioning or other contractual milestones when the Contract was terminated. If (contrary to Tetronics' primary submission) the failure to do so is found to have been a breach of the Contract, Tetronics contends that this failure was caused by BOA's own breaches of contract, namely: [CPHB1 ¶289]

    a. BlueOak's wrongful insistence that the furnace not be tapped until an alloy temperature of 1600°C (or 1550°C) was achieved; [CPHB1 ¶¶291-300]

    b. BlueOak's failure to provide feedstock compliant with the contract; [CPHB1 ¶¶301-309]

    c. BlueOak's improper maintenance and operation of the furnace. [CPHB1 ¶¶310-319]

175. Tetronics contends that under New York law its failure to complete the agreed milestones is excused by BlueOak's breaches, with the result that Tetronics is entitled to claim the payments that it otherwise would have received upon achieving the milestones. [CPHB1 ¶¶290,320,321,382]

(c) BlueOak's Alleged Breach of the Contract by Calling the HSBC Bond

176. Tetronics contends that BlueOak breached the Contract by calling on the HSBC Bond for several reasons, including that Tetronics was not in breach of any obligations under the Contract and because Clause 17.3(c) of the Contract only allows the HSBC Bond to be called "upon termination" and the purported termination did not occur until a month after the HSBC Bond was called. [CPHB2 ¶¶148-157; CPHB1 ¶¶322,324]

177. Tetronics contends that the outcomes of the English Court proceedings and the Emergency Measures Application are irrelevant as they were not final determinations of the question of whether, under New York Law, BlueOak breached the Contract by calling the HSBC Bond as and when it did. [CPHB1 ¶¶325,326]

178. Tetronics contends that as result of BlueOak's breach of contract by calling the HSBC Bond, Tetronics has suffered damages. [CPHB1 ¶327]

(d) BlueOak's Alleged Breaches of Contract: Preventing Tetronics from Achieving the Contractual Milestones

179. Tetronics contends that BlueOak breached the Contract in three ways which had the effect of preventing Tetronics from achieving contractual milestones and receiving payments under the Contract. The alleged conduct is the same conduct that Tetronics relies on (if needed) to excuse its own alleged breach by failing to achieve the milestones by the Gantt Chart dates. The alleged conduct is:

    a. Refusing to allow metal alloy to be tapped during commissioning attempts unless the alloy temperature was 1600°C or, later 1550°C, in breach of Clauses 4, 4.1, and 5.1 of the Conditions to the Contract; [CM1 ¶¶63, 66, 67; CM2 ¶¶50-55; CPHB1 ¶¶291-300]

    b. Providing feedstock that did not meet the Contract requirements, in breach of Clause 5.2 of the Conditions to the Contract; [CM1 ¶¶63, 64, 67; CM2 ¶¶56, 57; CM3 ¶131; CPHB1 ¶¶301-309]; and

    c. Failing to properly maintain and operate the furnace, in breach of Clauses 5.2 and 8.2 of the Contract; [CM1 ¶¶63, 65, 67; CM2 ¶¶48, 64-73; CM3 ¶132; CPHB1 ¶¶310-319]

(e) BlueOak's Alleged Breaches of the Contract by Disclosing Confidential Information

180. Tetronics contends that BlueOak breached Clauses 8.2 and 13.2 of the Contract by disclosing Tetronics' "Confidential Information" (as defined in the Contract) to Hatch. [CPHB1 ¶¶328-336]

181. Tetronics contends that Hatch is competitor of Tetronics, that Tetronics was not advised of BlueOak's disclosures of Confidential Information to Hatch, and that BlueOak actively concealed the disclosures. [CPHB1 ¶¶337-344]

182. Tetronics contends that, as result of the improper disclosures of Confidential Information to Hatch, Tetronics has suffered damages in the form of lost market share. [CPHB1 ¶¶345-350]

(f) BlueOak Resources' Alleged Breach of the License Agreement

183. Tetronics contends that under Clause 2.3.5 of the License Agreement BlueOak resources is liable for any damages resulting from the disclosure by BlueOak, as sub-licensee, of "Confidential Information as defined in the License Agreement. [CPHB1 ¶¶351-359] As a result, Tetronics contends that BlueOak Resources owes the same damages as BlueOak resulting from BlueOak's disclosure. [CPHB1 ¶¶357-359]

(g) BlueOak's Alleged Fraud in Relation to the Comfort Letter

184. Tetronics contends that by the Comfort Letter BlueOak made a representation to Tetronics as to BlueOak's state of mind, namely: that it did not deem Tetronics to be in breach of the Contract. Tetronics contends that this representation of fact was not true when it was made, as BlueOak actually believed that Tetronics was in breach of the Contract. [CPHB1 ¶¶362-364]

185. Tetronics contends that it relied on BlueOak's representation by continuing its efforts to arrange for the issuance of the HSBC Bond, that after the HSBC Bond was issued BlueOak obtained payment under the HSBC Bond and that, as a result, Tetronics became liable to HSBC for the sum of £3,080,000. [CPHB1 ¶365]

186. Tetronics claims the sum of £3,080,000 as damages caused by BlueOak's fraud. [CPHB1 ¶366]

(h) BlueOak's Alleged Fraud in Relation to the Required Tapping Temperature

187. Tetronics contends that BlueOak repeatedly represented to Tetronics that if the Second System could produce molten alloy with a temperature of 1600°C then that would allow for the alloy to be successfully granulated, when it knew that was not the case. [CPHB1 ¶¶368-373]

188. Tetronics contends that it relied on these representations by continuing its efforts to produce 1600°C alloy, in the course of which Tetronics incurred expenses of £1,012,142 which or claims as damages for fraud. [CPHB1 ¶¶374,375]

(i) Quantum of Damages and Interest Claimed by Tetronics

189. Tetronics claims total damages of £27,203,534, excluding interest, under the following heads of damage: [CPHB1 ¶¶321, 382(a) and (b)]

Outstanding Contract Payments	£2,111,392
Funds Payable Re: HSBC under Bond	£3,080,000
Additional Out of Scope Work	£1,012,142
Loss of Market Share	£21,000,000
Total (excluding interest)	**£27,203,534**

190. Tetronics alleges that it is entitled to be paid pre-award interest on the outstanding payments due under the Contract at the rate provided in Section 10.2 of the Contract (5% per annum above the base rate of the Bank of England). Tetronics alleges that it is entitled to be paid pre-award interest on its other damages at the rate of 9% per annum, being the statutory rate for New York set forth in N.Y. C.P.L.R. 5004. [CPHB1 ¶¶378,379,382(a)]

(j) Costs

191. Tetronics contends that it is entitled to an award of costs in accordance with the Costs Stipulation.

(B) Awards Sought by Tetronics

192. Tetronics seeks awards as follows: [CPHB1 ¶382]

a. Money damages in favor of Tetronics and against BlueOak in the amount of: (1) £2,111,392 in outstanding contractual payments; (2) £3,080,000 in funds from the second bond; (3) £1,012,142 in costs and expenses from additional work Tetronics performed outside the scope of the contract; (4) £126,011 in contractual interest; and (5) £573,404 in pre-award interest;

b. Money damages in favor of Tetronics and against BlueOak and BlueOak Resources, jointly and severally, in the amount of £21 million in Tetronics' expected loss market share;

c. A permanent injunction enjoining future unauthorized disclosures by BlueOak and BlueOak Resources of Tetronics' confidential information in breach of the License Agreement and/or Variation Agreement 02;

d. A declaratory judgment that the actions and breaches of BlueOak and BlueOak Resources result in forfeiture of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement;

e. A permanent injunction enjoining BlueOak and BlueOak Resources from the use or exercise of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement;

f. A declaratory judgment that Tetronics is not and has not been for all relevant times in breach of the Contract, and that BlueOak's call on the bond was unjustified and a breach of the Contract;

g. A declaratory judgment that BlueOak's termination of the Contract was unjustified;

h. An award of $1 million (USD) to Tetronics as the prevailing party for its reasonable and necessary attorney fees and costs incurred in this matter; and

i. An award of $170,000 (USD) to Tetronics as the prevailing party for its costs paid to the ICC.

(C) Summary of Respondents' Principal Contentions in Support of their Claims and in Answer to Tetronics' Claims

(a) Lawfulness of BlueOak's Contract Termination

193. BlueOak contends that it lawfully terminated the Contract because Tetronics was in breach of its material obligations under the Contract, BlueOak delivered the Default Notice dated 11 December 2017 and Tetronics failed to cure its defaults during the contractual cure-period. [RPHB1 ¶¶319-322]

194. BlueOak submits that there is no merit to Tetronics contention that BlueOak agreed to or acquiesced to Tetronics remediation plan or is estopped by its conduct. [RPHB2 ¶¶140-142]

(b) Tetronics' Alleged Breach of Contract: Missed Contract Deadlines

195. BlueOak contends that Tetronics' breached material obligations under Clause 2.1 of the Contract by failing to meet the contractual deadlines for commissioning of the Second System (including Completion of SUT by 8 February 2017, completion of PAT by 5 May 2017 and completion of FAT by 26 May 2017) as set out in the VA Gantt Chart. BlueOak contends that these deadlines were never extended. BlueOak denies that it is estopped from asserting the deadlines stated in the Contract. [RPHB1 ¶¶124-133; RPHB2 ¶¶74-84]

(c) Tetronics' Alleged Breaches of Contract: Alleged Deficiencies in Design and Function of the Second System (factual Allegations)

196. In summary, BlueOak contends that:

a. There were numerous defects in the off-gas system of the Second System, the design of which was unfit for its intended purpose, resulting in numerous shut-downs; [RPHB1 ¶¶137-153; RPHB2 ¶15(a)]

b. The Second System was unfit for its intended purpose because it could not reliably and safely superheat metal alloy to 1600°C; [RPHB1 ¶¶154-199; RPHB2 ¶¶33-60]

c. The feed system designed and supplied by Tetronics was defective; [RPHB1 ¶¶200-203; RPHB2 ¶25(b)]

d. The electrode seal repeatedly malfunctioned, the furnace could not retain heat due to oversized copper coolers and the refractory lining had to be replaced too soon and the thermocouples inside the furnace malfunctioned; [RPHB2 ¶25(c)]

e. While the Second System was designed to operate with suspended electrodes during attempts to commission the Second System Tetronics submerged the power electrodes into the furnace slag; [RPHB1 ¶¶204-208; RPHB2 ¶25(c)] and

f. While Tetronics promised a furnace with rapid heat-up and cool-down capabilities, after repeated shutdowns Tetronics began the unauthorized and very risky practice of using railroad steel or rebar (sometimes called

"firecrackers") to jump-start the furnace. [RPHB1 ¶¶209-211; RPHB2 ¶¶61-63]

(d) Tetronics' Alleged Breaches of Contract: Breaches of Condition and Express Warranties

197. BlueOak contends that Tetronics materially breached various express contractual promises and warranties concerning the Second System, as follows

a. Breach of Clause 2.2: Tetronics breached Clause 2.2 of the Conditions in the Contract by failing to exercise reasonable skill, care and diligence when designing the Second System; [RPHB1 ¶134]

b. Breach of Warranty in Clause 2.3: Tetronics breached its warranty in Clause 2.3 of the Conditions to the Contract "that the Plant shall comply with the Proposal and the Contract"; [RPHB1 ¶134]

c. Breach of Warranty in Clause 9.1(a): Tetronics breached its warranty in Section 9.1(a) of the Conditions to the Contract "that the Plant supplied by [Tetronics] conforms to this Contract and Proposal and shall be new, free from defects and shall, judged by prudent international industry standards, be of good workmanship and materials and, under normal operation conditions, shall show no defect due to engineering, design, fabrication, materials or workmanship"; [RPHB1 ¶134] and

d. Breach of Warranty in Clause 9.1(b): Tetronics breached its warranty in Section 9.1(b) of the Conditions to the Contract that "all the services rendered by [Tetronics] shall conform with this Contract and shall be, judged by prudent international industry standards, consistent with good technical service practice. The Seller shall correct defects or failure caused by the breach of this warranty;" [RPHB1 ¶134]

198. BlueOak contends that there is no merit to Tetronics' contention that the warranty period under Clauses 2 and 9.1 did not begin until FAT was achieved. [RPHB2 ¶¶16-24]

(e) Tetronics' Alleged Breaches of Duty of Good Faith

199. Alternatively, if there was no breach of the express terms of the Contract, BlueOak contends that Tetronics breached its duty of good faith and fair dealing implied under New York law:

a. By accepting 1600°C (and later 1550°C) as the metal alloy tapping temperature and then later disavowing it; [RPHB1 ¶¶220-226; RM1 ¶¶124-129; RM2 ¶¶186-189; RM3 ¶¶103-106; RPHB2 ¶¶98-101]

b. By preparing and refusing to correct misleading and incomplete site reports; [RM3 ¶104]

c. By refusing to co-operate with BlueOak in hiring a professional advisor to attempt to reedy problems with the Second System; [RM3 ¶104] and

d. By refusing to release the HSBC Bond unless BlueOak agreed to make an accelerated payment to Tetronics of £916,000. [RPHB1 ¶224]

(f) Tetronics Alleged Breaches of an Implied Warranty of Fitness

200. Tetronics breached the warranty implied under New York law that the goods and services supplied are fit for BlueOak's particular purpose; [RPHB1 ¶¶227-233; RPHB2 ¶¶103-108]

(g) Tetronics' Alleged Breaches of Contract: Failure to Comply with Insurance Requirements

201. BlueOak contends that Tetronics breached Article 14 of the Conditions to the Contract by: [RPHB1 ¶¶212-219; RM1 ¶¶130-138; RM2 ¶¶114-122; RM4 ¶¶77-83; RPHB2 ¶¶64-73]

a. Failing to obtain a policy of professional indemnity insurance that could indemnify BlueOak, as distinct from Tetronics, as required by Clause 14.1; and [RPHB1 ¶¶212-214, 217-219; RPHB2 ¶¶64-70]

b. Failing to notify BlueOak of substantial changes to its insurance policies as required by Clause 14.9; [RPHB1 ¶¶213, 215, 216; RPHB2 ¶72] and

c. Failing to provide insurance certificates during the term of the Contract as required by Clause 14.4. [RPHB2 ¶¶70,71]

(h) Tetronics' Alleged Tortious Wrongs: Fraud

202. BlueOak contends that under New York law it is entitled to pursue simultaneously claims in both tort and contract arising out of the same facts. [RPHB1 ¶¶239,240]

203. BlueOak contends that Tetronics committed fraud by actively concealing from BlueOak after July 2017 the fact that the Second System's design would never work as promised and by misrepresenting Tetronics' failing financial condition so as to solicit pre-payment of a commissioning milestone payment. [RPHB1 ¶¶241-245; RM1 ¶¶140-152; RM2 ¶¶192-198; RM3 ¶¶107,108]

(i) Tetronics' Alleged Tortious Wrongs: Negligent Misrepresentation

204. BlueOak contends, alternatively, that Tetronics negligently represented to BlueOak: [RPHB1 ¶¶246-248; RM1 ¶¶153-158; RM2 ¶¶199-203; RM3 ¶¶109,110]

    a. that the furnace that was part of the Second System was viable when it knew it was not; and

    b. that Tetronics was working on remedying the furnace defects and engineering flaws after BlueOak's Default Notice, when it actually was actively withholding relevant information.

(j) Tetronics' Alleged Tortious Wrongs: Professional Negligence

205. BlueOak contends that Tetronics committed professional negligence and malpractice because the Second System that it designed and installed was dangerous and defective as a result of Tetronics' failure to adhere to accepted standards of practice; [RPHB1 ¶249; RM1 ¶¶159-164; RM2 ¶¶204-211; RM3 ¶112]

(k) Quantum of Damages and Interest Claimed by BlueOak

206. BlueOak claims total damages of $12,164,932.74, under the following heads of damages: [RPHB1 ¶250; RPHB2 ¶133]

Payments Made under FEED & Supply Contract	$9,081,409.33
Unearned payment for Second System	$751,173.00
Additional costs (spares etc.)	$2,129,976.84

Fees Paid to Engineering Consultants	$202,373.57
Total (excluding interest)	**$12,164,932.74**

207. BlueOak contends that it is entitled to recover as damages payments made under the FEED & Supply Contract for the First System because:

    a. Variation 02 amended but did not replace the FEED & Supply Contract and the payments earlier made under the FEED and Supply Contract were agreed to be part of the Contract Price under the Contract, as amended; [RPHB1 ¶¶251,252]

    b. Tetronics and BlueOak agreed that despite making Variation 02 BlueOak reserved its rights to recover payments made for the First System if the Second System failed; [RPHB1 ¶253] and

    c. The total amount of $9,081,409.33 has been paid for the two Systems, neither of which worked, after giving credit for insurance proceeds received by BlueOak. [RPHB1 ¶254]

208. BlueOak contends that it is entitled to recover the amounts of $751,173.00 and $2,129,976.84 as damages caused by Tetronics: [RPHB1 ¶256]

    a. fraudulently concealing from BlueOak the extent of defects with the Second System since July 2017; and

    b. fraudulently inducing BlueOak to pay an unearned milestone payment based on false representations in March 2017.

209. BlueOak contends that it is entitled to recover the $202,373.57 in fees it paid to Hatch for the cost of engineering services it was forced to incur in order to uncover Tetronics' tortious actions. [RPHB1 ¶¶259]

210. BlueOak also claims $482,242.74 as pre-award interest on damages resulting from Tetronics' alleged fraud. Because the Contract rate of interest does not apply, BlueOak claims the New York standard rate for pre-judgment interest on tort claims. [RPHB1 ¶¶262-264]

(l) Costs

211. Respondents contend that they are entitled to an award of costs in accordance with the Costs Stipulation. [RPHB1 ¶¶265,266]

(m) BlueOak's Answers to Tetronics' Claims: BlueOak's Alleged Breaches of the Contract Excusing Tetronics' Non-Performance

212. BlueOak contends that under New York law the "impossibility defence" on which Tetronics' relies is available in very limited circumstances which Tetronics has failed to establish, and, specifically: [RPHB1 ¶¶271-274; RPHB2 ¶¶85-97]

    a. BlueOak did not prevent Tetronics from tapping the furnace; [RPHB1 ¶¶272-284]

    b. Feed supplied by BlueOak did not make it objectively impossible for Tetronics to achieve commissioning of the Second System; [RPHB1 ¶¶285-296] and

    c. Tetronics has failed to establish that BlueOak improperly maintained or operated the Second System. [RPHB1 ¶¶308-312; RPHB2 116-117]

(n) BlueOak's Answers to Tetronics Claims; BlueOak's Alleged Breaches Preventing Tetronics From Achieving Contractual Milestones

213. In its Second Post-Hearing Brief BlueOak contends as follows: [RPHB2 ¶¶111,112]

> 111. Tetronics' Amended Statement of Claims only asserts contract claims with respect to: (i) improper disclosures of confidential information; (ii) unauthorized modifications of the System and equipment; (iii) improper calling of the bond; and (iv) improper termination of VA02.
>
> 112. It would be a significant violation of Respondents' due process rights if the Sole Arbitrator were to allow Tetronics to amend its claims during post-hearing briefing. And that is precisely what Tetronics attempts to do here. Tetronics argues for the first time on pages 77 and 78 of its Post-Hearing Brief that BlueOak breached Clauses 4, 4.1, 5.1, and 5.2 of VA02 when it supposedly prevented Tetronics from tapping the furnace and supplied noncompliant feed. These claims are nowhere to be found in Tetronics' Amended Statement of Claim or other pleadings. The arguments are untimely and must be rejected.

214. Alternatively, BlueOak submits that these breach of contract claims are without merit. [RPHB2 ¶113]

(o) BlueOak's Answers to Tetronics' Claims: BlueOak's Alleged Breach of the Contract by Calling the HSBC Bond

215. BlueOak contends that it did not breach the Contract by calling the HSBC Bond because, under the Contract, properly interpreted, BlueOak was entitled to call the HSBC Bond without first terminating the Contract. [RPHB1 ¶¶313-318]

(p) BlueOak's Answers to Tetronics' Claims: BlueOak's Alleged Breach of the Contract by Disclosing Confidential Information

216. BlueOak contends that it did not breach the Contract by disclosing confidential information to Hatch for several reasons, including that Clause 13.2(e) of the Conditions to the Contract allows disclosures of confidential information that are "reasonably required to be made by either Party to its . . . professional advisors." [RPHB1 ¶¶304-307; RPHB2 ¶114]

(q) BlueOak Resources' Answers to Tetronics' Claims: BlueOak Resources' Alleged Breach of the License Agreement

217. BlueOak Resources contends that it did not breach the License Agreement by virtue of any BlueOak disclosure of confidential information to Hatch because Clause 5 of the License Agreement expressly provides scenarios under which the parties may disclose confidential information to third parties, including where a party "is required to disclose in the course of servicing or repair of the Equipment." [RPHB1 ¶¶299-301]

(r) BlueOak's Answers to Tetronics' Claims: BlueOak's Alleged Fraud in Relation to the Comfort Letter

218. BlueOak contends that Tetronics has "abandoned" its fraud claims, by failing to cross-examine on the relevant facts, so that the evidence relied on by BlueOak is uncontradicted. [RPHB1 ¶323]

219. BlueOak further contends that Tetronics failed to establish the required elements for a claim of fraud under New York law. [RPHB1 ¶¶323-328; RM3 ¶¶24-31,37-38, 114, 115; RPHB2 ¶¶122-132]

(s) BlueOak's Answers to Tetronics' Claims: BlueOak's Alleged Fraud in Relation to the Required Tapping Temperature

220. BlueOak contends that Tetronics' fraud claim concerning the required tapping temperature fails because Tetronics was required under the Contract to provide a working furnace that could superheat metal alloys to temperatures approximating 1600°C at the tap. [RM3 ¶116; RPHB2 ¶¶119-121]

(t) BlueOak's Answers to Tetronics' Claims: Quantum of Damages and Interest Claimed by Tetronics

221. With respect to Tetronics' claim for outstanding Contract payments (£2,111,392), BlueOak contends that Tetronics' failed to achieve the milestone events entitling it to those payments. BlueOak contends that Tetronics' claim, if characterized as a claim for the lost opportunity to earn the milestone payments, is precluded by Clause 12.1(a) of the Conditions to the Contract. [RPHB1 ¶116]

222. With respect to Tetronics' claim for additional out of scope work (£1,012,142), BlueOak contends that:

    a. These damages are precluded by Clause 12.1(a) of the Conditions to the Contract; [RPHB1 ¶339]

    b. There is no provision in the Contract for such payments; [RPHB1 ¶339] and

    c. The quantum claimed has not been sufficiently proven. [RPHB1 ¶340]

223. With respect to Tetronics' claim for funds paid under the HSBC Bond (£3,080,000), BlueOak repeats its denial of liability. [RPHB1 ¶341,342]

224. With respect to Tetronics' claim for loss of market share (£21,000,000), BlueOak contends that Tetronics has failed to discharge its burden of proving either liability or damages. [RPHB1 ¶344]

225. With respect to Tetronics' claim for pre-award interest, BlueOak contends that no interest is payable as there are no damages payable. [RPHB1 ¶343]

(D) Awards Sought by BlueOak and BlueOak Resources

226. Preliminary statements of the awards sought by BlueOak [TOR ¶80] and BlueOak Resources [TOR ¶85] were set out in the Terms of Reference. Since then amendments have been made and Respondents have added and deleted certain claims. The most recent concise statement by Respondents of the awards they seek appears in their Third Memorial. In their Post - Hearing Briefs certain of the amounts claimed changed. [RPHB1 ¶250] After asking that foundational findings of fact and law be made in the award, in their Third Memorial Respondents sought dispositive relief as follows (with changes requested in Post-Hearing Briefs noted in square brackets): [RM3 ¶¶135,136]

    a. Ordering Tetronics to compensate BlueOak for damages equal to not less than USD [$13,647,175.50] This figure includes:

        i. USD $9,081,409.33 for payments rendered to Tetronics for the first furnace.
        ii. USD $751,173.00 for unearned payments rendered to Tetronics for the second furnace.
        iii. USD [$2,129,976.84] for spare parts, utilities, supplies, and other non-legal fees directly caused by Tetronics' failure to commission the second furnace.
        iv. USD $202,373.57 for fees rendered to engineering consultants.
        v. USD $482,242.74 in pre-judgment interest on damages directly resulting from Tetronics' fraud, and
        vi. USD [$1,000,000 plus advances to the ICC] in ongoing attorney's fees and costs.

    b. [No longer sought due to Costs Stipulation] Ordering Tetronics to reimburse all costs and expenses incurred by BlueOak in this arbitration and the emergency proceedings, including without limitation all fees and expenses of the Sole Arbitrator, the ICC, experts, consultants, witnesses, and Respondents' officers and employees; and

    c. Awarding to Respondents such other and further relief to which they may show themselves to be justly entitled.

(E) Summary of Tetronics' Principal Contentions in Answer to BlueOak's Claims

(a) Tetronics' Answers to BlueOak's Claims: Tetronics' Alleged Breach of Contract: Missed Contract Deadlines

227. Tetronics contends that there is no language in the Contract requiring that Tetronics meet any of the projected dates described in various iterations of the Gantt Chart. [CPHB1 ¶¶128,129] Tetronics contends that the Gantt Charts only established non-binding target dates for completion of various steps. [CPHB1 ¶¶131,132]

228. Alternatively, even if Tetronics was obliged to complete each task described in the Gantt Charts at the dates stated therein, Tetronics contends that: [CPHB1 ¶¶128-142; CPHB2 ¶¶31]

    a. The deadlines were extended with BlueOak's agreement during the contractual cure-period, when Tetronics proposed and BlueOak accepted a revised plan and schedule, set out in the Final Gantt Chart, to complete the project; [CPHB1 ¶¶131-136; CPHB2 ¶¶42] or

    b. Alternatively, BlueOak is equitably estopped from asserting that it did not accept Tetronics' remedial plan and revised completion schedule; [CPHB1 ¶¶208-223; CPHB2 ¶¶126-131] or

    c. Alternatively, BlueOak breached its implied covenant of good faith and fair dealing by exercising its discretion to reject Tetronics' remedial plan and revised completion schedule. [CPHB1 ¶¶137-140] or

    d. Its failure to do so was caused by acts or omissions of BlueOak and was therefore excused as described above; [CPHB1 ¶¶131-134, 137-140, 208-223, 289; CPHB2 ¶¶32-41, 126-131] or

    e. Alternatively, any failure to achieve a deadline was not a *material* breach of the Contract. [CPHB1 ¶¶151,152; CPHB2 ¶¶43-46]

(b) Tetronics' Answers to BlueOak's Claims: Breaches of Contract - Alleged Deficiencies in Design and Function of the Second System (factual Allegations)

229. With respect to the deficiencies alleged by BlueOak in the off-gas system, Tetronics contends:

a. The evidence does not establish that there were material deficiencies with the off-gas system; [CPHB2 ¶¶94-98]

b. The problems with the off-gas system were primarily the result of BlueOak's own actions, including providing non-compliant feed, failures to properly maintain equipment, its insistence on achieving a 1600°C alloy temperature for tapping and the impact of brownouts caused by BlueOak's subcontractor; [CPHB2 ¶¶99-102]

c. Tetronics designed, installed and cold-tested, with BlueOak's approval, improvements to the Off-Gas System, but was prevented from proving their sufficiency because BlueOak terminated the Contract before hot commissioning was complete; [CPHB2 ¶¶103-105]

d. The Final Hatch Off-Gas Report did not take into account Tetronics' improvements and supports Tetronics' position. [CPHB2 ¶¶106-108]

230. With respect to BlueOak's contention that the Second System was deficient because it could not "reliably and safely superheat the metal alloy to 1600 degrees Celsius" Tetronics contends:

a. The Contract did not require that the Second System reliably supply metal alloy superheated to a temperature of 1600°C and it was not part of Tetronics' scope of supply to endure that the downstream temperature requirements for granulation were met; [CPHB1 ¶¶1-5, 9,10,13,15,21,22,25,26,63-104; CPHB2 ¶¶2-17, 58-72] and

b. The Second System achieved or was capable of achieving suitable alloy temperatures. [CPHB1 ¶¶105-124; CPHB2 ¶¶18-30]

231. With respect to BlueOak's contentions concerning the defective design of the feed system, Tetronics contends:

a. BlueOak has admitted that its own shredding process caused problems with the operation of the feed system; [CPHB2 ¶¶82-85, 91,92]

b. The evidence relied on by BlueOak does not actually show that the feed system caused problematic fires or explosions as alleged; [CPHB2 ¶¶86-90]

232. With respect to BlueOak's contentions concerning heat loss and other problems caused by oversized copper coolers, Tetronics contends that:

a. this allegation is based on a mis-construction of a single email from Tomasz Stachowski of Tetronics; [CPHB2 ¶23] and

b. Hatch attributed the furnace heat loss to the feed and holding alloy in the furnace too long, for both of which BlueOak is responsible; [CPHB2 ¶24]

233. With respect to BlueOak's contention that Tetronics submerged the electrodes into the furnace slag contrary to the furnace's design, Tetronics contends:

a. This was a temporary measure to try to achieve BlueOak's desired 1600°C molten alloy temperature for tapping; [CM2 ¶¶77-80; CPHB2 ¶¶73-75]

b. Submerged electrode mode is common in the industry; [CPHB2 ¶¶76-78]

234. With respect to BlueOak's contention that the furnace lacked rapid heat-up and cool-down capabilities and the use of "firecrackers" to jump-start the furnace, Tetronics contends:

a. The complaint about rapid heat-up and cool-down capabilities was not previously raised by BlueOak and lacks credibility for that reason; [CPHB2 ¶79]

b. BlueOak, through Foster, endorsed the use of "firecrackers" or "starter blocks" and the evidence shows that their use is standard in the industry; [CPHB2 ¶¶80, 81]

(c) Tetronics' Answers to BlueOak's Claims: Breaches of Contract - Alleged Breaches of Condition and Express Warranties

235. In answer to BlueOak's contention that Tetronics breached Clause 2.2 by failing to exercise reasonable skill, care and diligence when designing the Second System,

Tetronics contends that BlueOak has tendered no credible evidence of a breach of the contractual standard of care. [CPHB2 ¶¶50-52]

236. In answer to each of BlueOak's warranty claims, Tetronics contends that BlueOak acted prematurely when it purported to give the Default Notice and then to terminate the Contract. Tetronics contends that, by acting as it did, BlueOak wrongly repudiated the Contract and denied Tetronics the opportunity to correct any non-compliance with the warranties on which BlueOak relies. Tetronics also argues that the "Warranty Period" as defined in the Contract did not begin until the Second System passed the FAT. [CPHB1 ¶¶143, 154,155]

(d) Tetronics' Answers to BlueOak's Claims: Alleged Breaches of Duty of Good Faith

237. Tetronics contends that, in the circumstances, under New York law BlueOak cannot maintain its claim for breach of the implied covenant of good faith. [CPHB1 ¶¶157-159]

(e) Tetronics' Answers to BlueOak's Claims: Alleged Breaches of Implied Covenant of Fitness for Purpose

238. With respect to BlueOak's contentions concerning an implied warranty of fitness, Tetronics contends that:

    a. By Clause 18.2(b)(i) of the Conditions to the Contract the parties agreed to exclude any implied warranties; [CPHB1 ¶¶163-165] and

    b. BlueOak has failed to establish the required elements for such a claim. [CPHB1 ¶¶160-178; CPHB2 ¶¶110-118]

(f) Tetronics' Answers to BlueOak's Claims: Tetronics' Alleged Breaches of Contract - Failure to Comply with Insurance Requirements

239. With respect to BlueOak's allegations that Tetronics breached the requirement of Clause 14.01 of the Conditions to the Contract to maintain professional indemnity insurance in at least the amount of the Contract Price, Tetronics contends:

    a. Tetronics had in place the required professional indemnity policy, which would indemnify BlueOak; [CPHB1 ¶¶189-195] and

b. When Clause 14.01 is properly interpreted, the required professional indemnity insurance need only indemnify BlueOak against third party claims against BlueOak, of which there are none in this case. [CPHB1 ¶¶196]

240. With respect to its alleged failure to provide BlueOak with insurance certificates as required by Clause 14.4 of the Conditions to the Contract, Tetronics contends that the evidence shows that "certificates" are not provided by its English-based insurer but that the documents provided serve the same purpose. [CPHB1 ¶199]

241. With respect to the alleged failure to notify BlueOak of changes to its insurance as required by Clause 14.9 Tetronics contends that the only substantial change was the making of a claim as a result of BlueOak's allegations, of which BlueOak was well aware. [CPHB1 ¶¶200]

(g) Tetronics' Answers to BlueOak's Claims: Tetronics' Alleged Tortious Wrongs - Fraud

242. Tetronics contends that BlueOak's fraud claims cannot succeed because:

a. New York law bars fraud claims that are contractually based claims for economic losses. [CPHB1 ¶¶234-237]

b. Tetronics claims are based on statements of opinion, statements about future events or failures to disclose in the absence of a fiduciary duty, none of which are actionable under New York law; [CPHB1 ¶¶238-241]

c. The evidence does not establish the required elements for fraud claims under New York law. [CPHB1 ¶¶242-254]

(h) Tetronics' Answers to BlueOak's Claims: Tetronics' Alleged Tortious Wrongs - Negligent Misrepresentation

243. Tetronics contends that there is no basis under New York law for BlueOak's negligent misrepresentation claim, because:

a. the contractual relationship between Tetronics and BlueOak is not a "relationship of special trust and confidence;" [CPHB1 ¶¶268-271]

b. it is barred by the economic loss doctrine under New York law; [CPHB1 ¶¶272-274; CPHB2 ¶138] and

c. the evidence does not establish the required elements for a claim in negligent misrepresentation. [CPHB1 ¶¶275-277; CPHB2 ¶139]

(i) Tetronics' Answers to BlueOak's Claims: Tetronics' Alleged Tortious Wrongs - Professional Negligence

244. Tetronics contends that there is no basis under New York law for BlueOak's professional negligence claim, because:

a. It is barred by the economic loss doctrine under New York law; [CPHB1 ¶¶258-263] and

b. BlueOak has presented no evidence of the applicable standard of care or of any deviation by Tetronics from that standard. [CPHB1 ¶¶264-267]

(j) Tetronics' Answers to BlueOak's Claims: Quantum of Damages and Interest Claimed by BlueOak

245. Tetronics submits that the witness statement of Jennifer Satorius [RWS12] and its attachments, relied on by BlueOak in support of its claimed damages, should be "stricken" as matter of procedural fairness because they are untimely. [CPHB1 ¶¶278-280]

246. Tetronics further submits that:

a. BlueOak's damages claim must be reduced by £3,080,000.00 already received by BlueOak through its call on the HSBC Bond; [CPHB1 ¶281]

b. BlueOak's claim for additional costs ($2,129,976.84) and for fees paid to Hatch ($202,373.57) are both claims for "indirect, incidental or consequential losses" that are barred by Clause 12.2(a) of the Conditions to the Contract; [CPHB1 ¶¶282,282]

c. BlueOak is not entitled to recover the payments it made under the FEED & Supply Contract ($9,081,409.33) as the causes of the failure of the First

System and any claims for recovery of money paid under the FEED & Supply Contract are not the subject of this arbitration; [CPHB1 ¶284]

d. Alternatively, the evidence shows that BlueOak received $10.5 million in insurance proceeds through independent negotiations with its insurer and therefore cannot claim to have suffered a loss in relation to the First System; [CPHB1 ¶¶285,286]

e. Under the "collateral source rule" of New York law BlueOak cannot claim as losses funds that it actually received from its insurer, including the sum of $751,173.00 that it paid to Tetronics; [CPHB1 ¶287] and

f. BlueOak's claimed damages do not take into account proper mitigation. [CPHB1 ¶288]

VIII. ANALYSIS

247. Tetronics' primary allegations are that BlueOak breached the Contract by drawing on the HSBC Bond and purporting to terminate the Contract. BlueOak's primary defence to these allegations is that Tetronics materially beached the Contract, so that both the draw on the HSBC Bond and the Contract termination were proper. For these reasons, in the following analysis BlueOak's allegations of material breaches of the Contract by Tetronics are discussed first.

(A) Contractual Interpretation Under New York Law

248. The parties disagree about the proper interpretation of the Contract. The relevant principles of New York law concerning the interpretation of written commercial agreements are not in substantial dispute. [CPHB1 ¶¶53-57; RPHB1 ¶123] Areas of controversy concerning other principles of New York law and their application to this case are discussed in context later in this Analysis.

249. Under New York law, "[t]he best evidence of what parties to a written agreement intend is what they say in their writing." Thus, "a written agreement that is complete, clear and unambiguous on its face must be enforced according to the plain meaning of its terms." [CLX-39, *Greenfield v. Philles Records, Inc.,* 98 N.Y.2d 562, 569; 780 N.E.2d 166 (N.Y. 2002) (internal citations omitted)]

250. Extrinsic or parol evidence is "admissible only if a court finds an ambiguity in the contract." [CLX-41, *Schron v. Troutman Sanders LLP*, 986 N.E.2d 430 (N.Y. 2013)] A contract lacks ambiguity where it uses language with "a definite and precise meaning, unattended by danger of misconception in the purport of the [agreement] itself, and concerning which there is no reasonable basis for a difference of opinion." [CLX-39, *Greenfield,* 98 NY2d at 569] "[P]rovisions in a contract are not ambiguous merely because the parties interpret them differently." [CLX-40, *Mount Vernon Fire Ins. Co. v. Creative Hous. Ltd*., 668 N.E.2d 404 (N.Y. 1996)] "The parol evidence rule bars the consideration of extrinsic evidence of the meaning of a complete written agreement if the terms of the agreement, considered in isolation, are clear and unambiguous." [CLX-42, *Wayland Inv. Fund, LLC v. Millenium Seacarriers, Inc*., 111 F.Supp.2d 450, 454 (S.D.N.Y.2000); See also, CLX-43, *Sunrise Med. HHG, Inc. v. Health Focus of N.Y*., No. 01–CV–597, 2005 WL 357203, at *11, 2005 U.S. Dist. LEXIS 2045, at *36 (N.D.N.Y. Feb. 15, 2005)]

251. An integrated contract is one which "represents the entire understanding of the parties to the transaction." [CLX-44, *Investors Ins. Co. v. Dorinco Reinsurance Co.,* 917 F.2d 100, 104 (2d Cir.1990); See also CLX-45, *Battery Steamship Corp. v. Refineria Panama, S.A.,* 513 F.2d 735, 738 n. 3 (2d Cir.1975); CLX-47, *W.W.W. Associates, Inc. v. Giancontieri*, 77 N.Y.2d 157, 162; 565 N.Y.S.2d 440; 566 N.E.2d 639 (N.Y. 1990)] Parol evidence is admissible, however, if there is ambiguity in the contract, even if there is a merger or integration clause in the contract. [RLX-004, *Security Plans, Inc. v. CUNA Mut. Ins. Soc'y,* 769 F.2d 807, 816-17 (2d Cir. 2014)]

(B) Tetronics' Alleged Breach of Clause 2.1: The Gantt Charts

(a) The Parties' Contentions

252. Clause 2.1 of the Contract states that Tetronics "shall, subject to the provisions of the Contract, design, manufacture, deliver to the Site, oversee installation, and Commission the Plant" (emphasis added). BlueOak contends that because the VA Gantt Chart is incorporated into the Contract, Tetronics was bound by Clause 2.1 to meet the "deadlines" established by the VA Gantt Chart. BlueOak contends that the written agreement of both parties is required to vary the deadlines established by the VA Gantt Chart and that, although Tetronics proposed changes, no written agreement was ever reached to change the deadlines. BlueOak contends that Tetronics' breached material obligations under Clause 2.1 of the Contract by failing to meet the contractual deadlines for commissioning of the Second System (including Completion of SUT by 8 February 2017, completion of PAT by 5 May 2017

and completion of FAT by 26 May 2017) as set out in the VA Gantt Chart. [RPHB1 ¶¶124-133; RPHB2 ¶¶74-84]

253. Tetronics does not dispute that the dates contemplated for completion of some stages of the project as set out in the VA Gantt Chart were not met. It submits, however, that it did not covenant to meet the dates set out in the VA Gantt Chart and that a failure to meet the Gantt Chart dates is not a breach, or alternatively, not a material breach of the Contract giving rise to a right to terminate. Tetronics contends that the Gantt Charts only establish non-binding target dates for completion of various steps. [CPHB1 ¶¶128,129,151,152; CPHB2 ¶¶43-46, 131,132] [CPHB1 ¶¶128,129]

254. Tetronics also makes several alternative arguments, including, that:

    a. The VA Gantt Cart dates were extended with BlueOak's agreement when Tetronics proposed and BlueOak accepted a revised plan and schedule, set out in the Final Gantt Chart, to complete the project; [CPHB1 ¶¶131-136; CPHB2 ¶¶42]; or

    b. BlueOak is equitably estopped from asserting that it did not accept Tetronics' remedial plan and revised completion schedule; [CPHB1 ¶¶208-223; CPHB2 ¶¶126-131] or

    c. BlueOak breached its implied covenant of good faith and fair dealing by exercising its discretion to reject Tetronics' remedial plan and revised completion schedule. [CPHB1 ¶¶137-140] or

    d. Any delays were caused by acts or omissions of BlueOak and Tetronics' breaches are therefore excused. [CPHB1 ¶¶131-134, 137-140, 208-223, 289; CPHB2 ¶¶32-41, 126-131]

(b) Analysis

255. The VA Gantt Chart included, among others, the following dates: installation of equipment (9 December 2017); completion of CDR (31 May 2016); completion of commissioning (3 February 2017); completion of Startup Tests known as SUT 1 and SUT 2 (22 February 2017); completion of Preliminary Acceptance Test, known as PAT (5 May 2017), and; completion of Final Acceptance Test, known as FAT (26 May

2017). BlueOak acknowledges, indeed emphasizes, that from the outset the project was behind schedule. For example, it states that equipment installation did not actually occur until 14 April 2017 (over 4 months late) and that the Second System was never commissioned despite almost 6 months of attempts to do so. [RPHB1 ¶¶125,126]

256. I agree with Tetronics that a careful reading of the Contract shows that there is no text in the Contract whereby Tetronics covenants and agrees to complete each step indicated in the VA Gantt Chart on or before the date stated in the VA Gantt Chart. Clause 2.1 describes in general terms what Tetronics has agreed to do, but it establishes no dates by which any of the relevant steps – including delivery, installation and commissioning of the Second System, must be completed. Clause 2.1 does not refer to the VA Gantt Chart. The VA Gantt Chart describes over 30 individual steps and gives a duration and completion date for each. The plain meaning of the words used in Clause 2.1 does not establish a contractual intention that Tetronics would be in material breach of the Contract if it missed any one of the dates set out in the VA Gantt Chart, or certain of them.

257. This finding strongly supports Tetronics' contention that, when the Contract is properly interpreted, the Gantt Chart dates generally were intended to be targets, rather than fixed and material deadlines as BlueOak contends. There is no provision in the Contract that time is to be of the essence. I have reviewed the provisions of the Contract to determine whether there are any indications of what the consequences were to be if the VA Gantt Chart dates were missed.

258. Clause 10C of the Conditions to the Contract states: [RX-001]

> **10C Variation Agreement Gantt Chart**
>
> Prior to the completion of the Replacement Works CDR, the Seller may submit to the Buyer for approval a revised VA Gantt Chart in accordance with the process for Change Orders set forth in Clause 6.4. In the event that the Seller does not submit such a revision or if the Parties are unable to agree upon the revised VA Gantt Chart, then the VA Gantt Chart attached hereto as Schedule 7 shall remain in place.

259. Clause 10C indicates that the VA Gantt Chart attached to the Contract is not necessarily final and that as part of finalizing the design through the CDR the parties might agree to changes. If no changes were agreed, the VA Gantt Chart "would

remain in place." Again, while indicating that the Gantt Chart has contractual significance, the Clause does not state that Tetronics promised to complete each step described in the VA Gantt Chart by the date it indicates or agreed that a failure to do so would be a material breach.

260. Clause 12.3A of the Conditions to the Contract, however, deals expressly with the consequences of a failure to meet one set of dates in the "controlling version" of the VA Gantt Chart, as follows (with emphasis added): [RX-001]

> **12.3A Liquidated Damages for Delay in Delivery of Replacement Works**
>
> (a) If (x) the Parties are unable to agree upon an updated VA Gantt Chart during Replacement Works CDR and (y) there is a delay in delivery of Replacement Equipment beyond the time periods set forth in the controlling version of the VA Gantt Chart due to reasons attributable to Seller, then Buyer shall be entitled to liquidated damages per completed week of delay at a rate of one half percent (0.5%) of the Replacement Works Price per week of delay; provided, that such liquidated damages shall not exceed five percent (5%) of the Replacement Works Price. Buyer shall be entitled to deduct the applicable amount of liquidated damages from the nearest Milestone payment due.
>
> (b) If (x) the Parties are able to agree upon an updated VA Gantt Chart during Replacement Works CDR and (y) there is a delay in delivery of Replacement Equipment beyond the time periods set forth in the controlling version of the VA Gantt Chart due to reasons attributable to Seller, then Buyer shall be entitled to liquidated damages per completed week of delay at a rate of one half percent (0.5%) of the Contract Price per week of delay; provided, that such liquidated damages shall not exceed five percent (5%) of the Contract Price. Buyer shall be entitled to deduct the applicable amount of liquidated damages from the nearest Milestone payment due….

261. Clause 12.3A is an example of the kind of provision that one would expect to find in the Contract if missing "the time periods set forth in the controlling version of the VA Gantt Chart" for a specific task is to have remedial consequences. Clause 12.3A deals only with the remedial consequences of delayed delivery of Replacement Equipment. The remedy specified is liquidated damages. No claim is made by BlueOak in this proceeding in reliance on Clause 12.3A. There is not in the Contract any similar provision addressing remedies for failures to comply with other Gantt Chart dates.

262. The language of the Contract does not tie the installation of the equipment or the completion of commissioning to the dates set out in the VA Gantt Chart. Clauses 3 and 4 of the Conditions to the Contract state (emphasis added):

> **3. Installation of the Plant**
>
> Following delivery of the Plant, the Seller shall supervise the installation of the Plant at the Site. The Buyer shall be responsible for providing appropriately skilled personnel to undertake the installation.
>
> **4. Commissioning the Plant and Testing**
>
> 4.1 Following installation of the Plant at the Site, the Parties shall undertake Commissioning. Seller shall supervise Commissioning and both the Seller and Buyer will provide adequate resources to ensure its timely completion. On completion of Commissioning, the Seller and Buyer shall, without undue delay, undertake Start Up.

263. In my view it would be wrong to construe the phrase "timely completion" to mean "completion by the date or dates set out in the controlling version of the VA Gantt Chart." If that had been the intention, language like that used in Clause 12.3A would have been used. In Clause 4.1, the "timely completion" requirement is imposed on *both parties* to record their mutual intention that they will not impede progress by failing to provide adequate resources. In my view, in the context of Article 4.1 the phrase simply means "without undue delay."

264. Clause 11.2 deals with the Preliminary Acceptance Test, known as PAT. There is no language stating that PAT must be commenced or completed by a date set out in the controlling version of the VA Gantt Chart. Clause 11.2 (a) states only that "…[t]he Seller will use its reasonable efforts to cause the PA Test to occur, but will not be liable for delays attributable to the Buyer." Clause 11.2(c) provides for the PAT to be redone if the PAT criteria are not met on the first attempt. Clauses 11.2 (d) and (f) then state (emphasis added): [RX-001]

> (d) If the criteria have not been met, though the PA Test has been repeated under the provisions of Clause 11.2(c), within one (1) month, unless extended according to Clause 11.2(f), from the date of receipt by the Seller of the assay results following the first PA Test, the Seller shall be deemed to have failed to fulfil its obligations under this Contract and the Buyer shall have recourse to the remedies as provided for under this Contract including those remedies set forth in Clause 11.4 and Clause 17.

(e) If, due to reasons not attributable to the responsibility of the Seller hereunder other than an event described in Clause 15, the PA Test has not been conducted within 11 months following delivery to the Site of the Replacement Equipment, then the Plant shall be deemed to have successfully passed the PA Test and the deemed passed PA Test shall have the same effect as a successfully conducted PA Test.

(f) Seller may extend the deadline specified under Clause 11.2(d) by up to 3 months through payment by Seller to Buyer of a PAT extension fee of $USD 100,000 per month. Additional extensions are subject to mutual agreement of Buyer and Seller.

265. Clause 11.2 makes no reference to the date for completion of PAT set out in the controlling version of the Gantt Chart. The VA Gannt Chart sets out dates for commencement as well as completion of PAT over a period of 5 days and allows an additional 10 days to assess the results. Yet under Clause 11.2, the period allowed for successful completion of PAT could be extended by an additional month, or possibly more. Clause 11.2(d) makes clear that it is only when the times allowed by Clause 11.2 have expired without PAT being achieved that BlueOak may have recourse to "the remedies as provided for under this Contract including those remedies set forth in Clause 11.4 and Clause 17." It would contradict the plain meaning of Clause 11.2 to interpret the Contract in such a way that BlueOak could terminate under Clause 17 if PAT was not complete by the date set out in the VA Gantt Chart.

266. Clause 11.3 deals with the Final Acceptance Test, known as FAT. There is no language stating that FAT must be commenced or completed by a date set out in the controlling version of the VA Gantt Chart. Clause 11.3(a) states that "[u]pon issuance of the PA Test Acceptance Certificate, the Buyer and Seller shall cooperate to select a date to conduct the FA Test, which shall be carried out in accordance with the conditions and procedures set forth in Schedule 6" (emphasis added). It would be inconsistent with Clause 11.3 to interpret the Contract such that the specific date for FAT commencement set out in the VA Gantt Chart was final and binding.

267. Clauses 11.3 (c) and (d) set out a process for the possible repetition of the FAT if the FAT criteria are not met on the first attempt. Clause 11.3(e) then states: [RX-001]

(e) If, due to reasons attributable to the responsibility of the Seller hereunder, the guaranteed performance for the FA Test has not been met within two (2) months from the date of receipt of the assay from the relevant laboratory following the first FA Test conducted under Clause11.3(a), though the FA Test has been repeated under the provisions of Clause 11.3(d) and the results are not within the Tolerated Range, the Seller shall be deemed to have failed to fulfil its obligations under this Contract and the Buyer shall have recourse to the remedies provided for under this Contract as set forth in Clause 11.4 and Clause 17.

268. The VA Gantt Chart sets out a period of 7 days for completion of FAT and a further 10 days for results analysis. Again, to interpret the Contract as though the VA Gantt Chart dates for commencement and completion were fixed agreed dates, which if not met would result in a material breach, would contradict the very specific provisions of Clause 11.3.

269. Schedule 2 to Schedule A to Variation 02 describes when payments are to be made by BlueOak to Tetronics in respect of the "Contract Price" and the "Replacement Contract Price." Payments are keyed to the actual achievement of specific milestones such as commissioning, SUT 1, SUT 2 and FAT. The payments are not scheduled to be made on specific dates or expressed to be conditional on compliance with dates set out in the VA Gantt Chart.

270. In summary, I find that the plain language of the Contract is inconsistent with an interpretation of the Contract whereunder, as BlueOak submits, the VA Gantt Chart dates are binding "deadlines" by which Tetronics must complete each step. There is no ambiguity. When the parties intend that there would be remedial consequences if a date set out in the VA Gannt Chart is missed, they state so expressly, as with Clause 12.3A. Absent such a specific provision, a failure to meet a date set out in the VA Gantt Chart is not in itself a material breach of the Contract.

(c) Conclusion

271. For the reasons I have stated, I reject BlueOak's contention that the mere failure of Tetronics to achieve dates set out in the VA Gantt Chart is a material breach of the Contract.

272. As a result of my finding, is not necessary to decide the alternative arguments raised by Tetronics to dispose of BlueOak's claims and defences based on an alleged breach of Clause 2.1 of the Contract.

(C) Tetronics' Alleged Breaches of Warranty: Clauses 2.3, 9.1(a) and 9.1(b)

(a) The Parties' Primary Contentions Concerning Breach of Warranty

273. BlueOak alleges that the Plant, Equipment and services provided by Tetronics did not conform to Tetronics' warranties under Clauses 9.1(a), 9.1(b) and 2.3.

274. As set out in more detail earlier in this award, BlueOak alleges the following deficiencies in design or performance that are allegedly not compliant with these warranties:

    a. defects in the off-gas system; [RPHB1 ¶¶137-153; RPHB2 ¶15(a)]

    b. inability to reliably and safely superheat metal alloy to 1600°C; [RPHB1 ¶¶154-199; RPHB2 ¶¶33-60]

    c. defects in the feed system; [RPHB1 ¶¶200-203; RPHB2 ¶25(b)]

    d. defective electrode seals, inability to retain heat sufficient heat due to oversized copper coolers, the refractory lining had to be replaced too soon and malfunctioning thermocouples inside the furnace; [RPHB2 ¶25(c)]

    e. Attempting to commission the Second System by submerging the power electrodes into the furnace slag; [RPHB1 ¶¶204-208; RPHB2 ¶25(c)] and

    f. Employing the unauthorized and risky practice of using steel "firecrackers" to jump-start the furnace. [RPHB1 ¶¶209-211; RPHB2 ¶¶61-63]

275. BlueOak contends that the contractual "Warranty Period" began when Tetronics delivered the "Replacement Equipment" as defined in the Contract. BlueOak submits that it learned of the problems referenced in its Default Notice when it received the Final Hatch Cold Alloy Report and Final Hatch Off-Gas Report on 8 December 2017, long after the Replacement Equipment had been delivered and installed, and that it promptly delivered its Default Notice on 11 December 2017. [RPHB2 ¶21]

276. Tetronics contends that BlueOak acted prematurely when it purported to give the Default Notice and then to terminate the Contract. Tetronics contends that, by acting as it did, BlueOak wrongly repudiated the Contract and denied Tetronics the

opportunity to correct any non-compliance with the warranties on which BlueOak relies. [CPHB1 ¶143] Tetronics also argues that the "Warranty Period" as defined in the Contract did not begin until the Second System passed the FAT. [CPHB1 ¶¶154,155]

277. As described earlier in this award, Tetronics advances a series of alternative answers to the allegations of breach of warranty, including answers to each specific instance of alleged non-conformity with the warranties.

(b) The Warranties Under Clauses 9.1(a) and 9.1(b)

278. In the Conditions to the Contact, "Plant" is defined to mean "the Equipment and, where such Equipment is replaced by Replacement Equipment pursuant to the Variation Agreement 02, the Replacement Equipment." "Equipment" is defined to mean "the equipment to be designed, manufactured, supplied and/or installed by the Seller as more particularly described in the Proposal." [RX-001]

279. Clauses 9.1(a), 9.1(b), 9.2 and 9.5 of the Conditions to the Contract state (emphasis added):

> **9. Warranties**
>
> 9.1 (a) Subject to Clause 9.5 below, the Seller warrants that the Plant supplied by the Seller conforms to this Contract and Proposal and shall be new, free from defects and shall, judged by prudent international industry standards, be of good workmanship and materials and, under normal operation conditions, shall show no defect due to engineering, design, fabrication, materials or workmanship.
>
> (b) The Seller warrants that all the services rendered by the Seller shall conform with this Contract and shall be, judged by prudent international industry standards, consistent with good technical service practice. The Seller shall correct defects or failure caused by the breach of this warranty. The claims under this warranty need to be made in writing to the Seller within one (1) month after having been discovered.
>
> 9.2 The Seller's obligations under the warranties in Clause 9.1 (a) shall be effective for two years following issuance of the Final Acceptance Certificate but in no case longer than thirty six (36) months after Replacement Equipment delivery to the Site (hereinafter referred to as "Warranty Period"). If, during the aforesaid Warranty Period the Plant

fails to meet the warranties as provided for in Clause 9.1 (a) hereof and the Buyer informs the Seller thereof in writing stating the nature of such failure within one (1) month after having been discovered, the Seller shall, at its expense, repair, make good, replace or modify the Plant as soon as practicable at the Site and shall notify the Buyer of its plans and expected timetable. Where reasonable and at the request of the Seller, the Buyer will make its employees and equipment available to assist in any repairs at no charge to the Seller. Where reasonable (such as for minor parts or defects), repair parts may be furnished by the Seller to the Buyer for installation by the Buyer. Notwithstanding the foregoing, the Buyer's failure to give the Seller written notice of any claim prior to the expiration of the Warranty Period shall constitute an absolute and unconditional waiver of such claim. Justified warranty claims shall only obligate the Seller to correct the defect by repairing or replacing the defective part(s), the option of repair or replacement is at the Seller's reasonable option.

…

9.4 If the Seller does not commence the correction of such defects within a reasonable period and with notification of the Seller's plans and expected timetable but in any event not longer than thirty (30) days from the date of receipt of notice from the Buyer or does not complete the said correction with reasonable diligence, the Buyer may, at its option, correct the defects at the Seller's risk and expense provided the Buyer does so in a reasonable manner. The Seller shall reimburse the expense incurred by the Buyer for remedy of such defects within thirty (30) days from the date of receipt of the Buyer's invoice

9.5 The Seller shall not be responsible and these warranties shall not apply if the Equipment or Replacement Equipment has been subjected to any of the following occurrences and such occurrence directly contributed to the failure of the Equipment or Replacement Equipment to be in compliance with the warranty:

(a) Incorrect or negligent operations or improper maintenance in violation of normal operating procedures provided by Seller to Buyer.

(b) alterations made otherwise than by or with the written consent of the Seller or as set forth in this Contract.

(c) defects attributable to the Plant not being properly maintained or operated under normal operating conditions by or on behalf of the Buyer by any person other than the Seller.

(d) fair wear and tear or where otherwise the relevant part or parts of the Equipment or Replacement Equipment has been consumed or worn out in normal operating procedures provided by Seller to Buyer.

(c) Analysis: Interpretation of the Warranties Under Clause 19.1(a)

280. Clause 9.1(a) applies in several situations, namely: (i) if the Equipment does not conform to the Contract and Proposal; (ii) if the Equipment is not new, free from defects and (judged by prudent international industry standards) of good workmanship and materials and (iii) if under normal operation conditions the equipment shows a defect due to engineering, design, fabrication, materials or workmanship.

281. Clause 9.2 provides that the Warranty Period in respect of Clause 9.1(a) begins on delivery of the Replacement Equipment to the site and continues for the lesser of (i) three years from that date and (ii) two years from the issuance of the Final Acceptance Certificate. Despite this, it is noteworthy that the third category of warranty under Clause 9.1(a) refers to defects shown under "normal operation conditions." Clause 9.5 lists circumstances where none of the Clause 9.1 warranties apply. The circumstances all relate to events that typically might occur during normal operations, which I interpret to mean post-commissioning operations.[2]

282. Tetronics submits, relying on *St. Anne-Nackawic Pulp Co v. Research-Cottrell, Inc*., 788 F.Supp. 729, 734-735 (S.D.N.Y. 1992) [CLX-121] that where goods are subject to inspection or testing before acceptance is final, the goods are neither conforming nor non-conforming until the testing is complete. Tetronics submits that until the Second System was non-conforming, as evidenced by a failure to achieve FAT, there could be no breach of any of the warranties on which BlueOak relies. [CPHB1 ¶¶154,155]

283. BlueOak emphasizes that Clause 9.2 of the Contract expressly provides that "[t]he Seller's obligations under the warranties in Clause 9.1(a) shall be effective for two years following issuance of the Final Acceptance Certificate but in no case longer

[2] The Conditions to the Contract define "Commissioning" as follows: "Commissioning" means bringing the Plant into working condition as demonstrated by achieving 90% throughput for each Plant sub-system during a 24-hour run period as determined by Buyer and Seller and "Commission" and "Commissioned" shall be construed accordingly.

than thirty six (36) months after Replacement Equipment delivery to the Site (hereinafter referred to as 'Warranty Period.')" (emphasis added). [RPHB2 ¶¶18,19]

284. Alternatively, BlueOak submits that the present case is analogous to *Triangle Underwriters, Inc. v. Honeywell, Inc.,* 604 F.2d 737, 742-43 (2d Cir. 1979) [RLX-047] in which defendants were hired to design, install and integrate a computer system. The delivery and installation were problematic from the beginning, as the system did not work as expected during start-up. Defendants attempted to fix the system for over two years, but to no avail. The Second Circuit held that the "breach occurred when the system was installed … and proved itself incapable." [*Triangle Underwriters* at p. 742; RPHB2 ¶¶23,24]

285. I find the plain meaning of the Contract is that the warranties under Clause 9.1(a) take effect as of the time the Replacement Equipment is delivered. While a non-conformity with the first two warranty categories covered by Clause 9.1(a) might be discovered on delivery of the Replacement Equipment or at any time thereafter, claims in respect of the third category (that under "normal operation conditions", the equipment shows a defect due to engineering, design, fabrication, materials or workmanship) could as a practical matter only arise after Commissioning was achieved.

286. Under Clause 9.2, Tetronics has no obligation in relation to Clause 9.1(a) unless it has been given notice by BlueOak within one month of BlueOak's discovery of the alleged non-conformity with the Clause 9.1(a) warranties. Under Clause 9.2, Tetronics' warranty obligation is breached only if, after receiving the requisite notice from BlueOak, Tetronics fails to correct the defect "as soon as practicable" or fails to notify BlueOak of its plans and expected timetable to correct the defect.

287. Under Clause 9.4, if Tetronics does not "commence" to correct the non-conformity within thirty days or complete it with "reasonable diligence" then BlueOak has the option of doing the corrective work itself and charging the cost back to Tetronics. I find that Clause 9.4 reflects the mutual intention of the parties that Tetronics was obliged to commence to correct defects within a reasonable period, and in any event within 30 days, and complete the correction with reasonable diligence. The plain meaning of Clause 9.4, however, is that, while BlueOak has the option to perform the work itself if Tetronics has not commenced work within 30 days, Tetronics has not promised to complete the correction of any non-conformity within any particular time-frame.

(d) Conclusion Re: Interpretation of Warranties Under Clause 9.1(a)

288. In summary, a non-conformity with the warranties under Clause 9.1(a) may give rise to a right of termination under Clause 17 if, and only if:

    a. BlueOak gives notice of the non-conformity within one month of its discovery; [Clause 9.2] and

    b. Tetronics fails to:
        i. Notify BlueOak of its plans and expected timetable in relation to the correction; [Clause 9.2] or
        ii. Commence the corrective work within a reasonable period, and in any event not longer than 30 days; [Clause 9.4] or
        iii. Carry out the corrective work with reasonable diligence; [Clause 9.4] or
        iv. Complete the corrective work as soon as practicable; [Clause 9.2] and

    c. The failures are material. [Clause 17]

(e) Analysis: Interpretation of the Warranty Under Clause 9.1(b)

289. The warranty under Clause 9.1(b) relates primarily to the standard of the design and engineering services that Tetronics was to provide. Tetronics warrants that all "the services rendered" by Tetronics shall (i) conform with the Contract and (ii) be, judged by prudent international industry standards, "consistent with good technical service practice." Under Clause 9.1(b), if BlueOak discovers services that do not conform to the warranty, it must notify Tetronics within one month. Under the same Clause, the obligation of Tetronics is to "correct defects or failure caused by the breach of this warranty."

290. Clause 9.2 expressly applies only to the warranties under Clause 9.1(a). It does not apply to the warranties under Clause 9.1(b). The Warranty Period established by Clause 9.2 does not apply. Clause 9.1(b) states, however, that "claims under this warranty need to be made in writing to the Seller within one (1) month after having been discovered." The plain meaning of the Contract is that claims must be made within 30 days of discovery. It would be inconsistent with the requirement for

making claims within 30 days, to conclude that, even if a defect was discovered long before FAT, claims cannot be made until after FAT is completed. If the warranty was intended to apply only to claims discovered after FAT, much clearer language would have been used. I find that notification of warranty claims under Clause 9.1(b) could be made before FAT, so long as they were made within 30 days of BlueOak's discovery of the alleged non-compliance.

291. Clause 9.4 does not state expressly whether it applies to non-conformities with both the Clause 9.1(a) warranties and the Clause 9.1(b) warranty. Clause 9.4 states that it applies "[i]f the Seller does not commence the correction of such defects within a reasonable period…." In my view the phrase "such defects" is intended to capture non-conformities with both sets of warranties; that is, it applies to both defective (non-conforming) Equipment and services. If the intention of the parties had been to limit its application to defects in relation to Clause 9.1(a) then language such as that used in Clause 9.2 would have been used.

292. Clause 9.1(b) does not specify when corrective work must begin or be completed. The requirement under Clause 9.2 that work is to be completed "as soon as practicable" does not apply. As with the Clause 9.1(a) warranty, however, Clause 9.4 reflects the mutual intention of the parties that Tetronics was obliged to commence to correct the defects or failure within a reasonable period, and in any event within 30 days, and was obliged to complete the corrections with reasonable diligence.

293. Again, as the Contract is silent on the matter, whether a breach in relation to the warranty under Clause 9.1(b) is or may be a material breach must be assessed on a case by case basis.

(f) Conclusion RE: Interpretation of Warranty Under Clause 9.1(b)

294. In summary, I find that a non-conformity with the warranty under Clause 9.1(b) may give rise to a right of termination under Clause 17 if, and only if:

    a. BlueOak gives notice of the non-conformity within one month of its discovery; [Clause 9.1(b)] and

    b. Tetronics fails to:

i. commence to correct the defects or failures within a reasonable time, not longer than thirty days; [Clause 9.4] or
ii. complete the defects or failures with reasonable diligence; [Clause 9.4] and

c. The failures are material. [Clause 17]

(g) Analysis: Interpretation of the Warranty Under Clause 2.3

295. Clause 2.3 of the Conditions to the Contract states (emphasis added):

> 2.3 The Seller warrants that the Plant shall comply with the Proposal and the Contract.

296. Unlike the specific warranty provisions already discussed, Clause 2.3 does not contain any requirement for notification of the breach of warranty by BlueOak or any provision giving Tetronics an opportunity to correct the defect. There is nothing stating when the warranty period with respect to this warranty begins or ends. There is no provision requiring Tetronics to promptly commence or diligently seek to complete corrective work. There is no provision giving BlueOak the option to correct defects at Tetronics' expense. Indeed, no remedy at all is specified. The Clause 2.3 warranty is, however, virtually identical to Clause 9.1(a), which states "[s]ubject to Clause 9.5 below, the Seller warrants that the Plant supplied by the Seller conforms to this Contract and Proposal."

297. I have considered how the bare-bones language of Clause 2.3 can sensibly be read and construed with other detailed provisions of the Contract dealing with precisely the same subject matter. Did the parties intend that, despite the carefully balanced warranty regime established by Clauses 9.1, 9.2, 9.3, 9.4 and 9.5, BlueOak was, in respect of precisely the same alleged material non-conformity, to be at liberty under Clause 2.3 to immediately give a notice of default and then terminate under Clause 17 in the event the default was not cured within 30 days?

298. I find that such an interpretation would result in internal inconsistencies within the Contract and does not make commercial sense. I find that the better interpretation is that the detailed warranty provisions were intended to establish the regime for claims under Clause 2.3 and it was for this reason that the language of Clause 2.3 was repeated in Clause 9.1(a). That interpretation gives full effect to all provisions

of the Contract, avoids inconsistency and avoids commercial absurdity. A claim under Clause 2.3 is thus subject to the same contractual regime as a claim under the first category of warranty under Clause 9.1(a).

(h) Analysis: BlueOak's Claims of Material Breach of Warranty

299. BlueOak submits as follows (emphasis added): [RPHB2 ¶21]

> 21.If during the warranty period the System "fails to meet the warranties provided for in Clause 9.1(a)," then BlueOak was contractually required to inform Tetronics in writing within one month of discovery of any problems with the System, at which point Tetronics "shall, at its expense, repair, make good, replace or modify the Equipment as soon as practicable and shall notify the Buyer of its plans and expected timetable." BlueOak complied with this notice requirement when it sent its Notice of Default to Tetronics within days of its receipt of the finalized December 8, 2017 Hatch reports that confirmed Tetronics had materially breached its warranty obligations under VA02.

300. The 11 December 2017 Default Notice was on its face intended to serve as a notice of material breach and non-compliance with the warranties in Clauses 9.1(a), 9.1(b) and 2.2 of the Contract. It states (emphasis added): [RX-004]

> Pursuant to Schedule 3 to Schedule A of the Variation Agreement ("Agreement") between [Tetronics] and [BlueOak], BlueOak hereby notifies Tetronics that it has materially breached the Agreement and that the Plant supplied to BlueOak by Tetronics fails to conform to the warranty standards set forth in the Agreement.
>
> As you know, Section 9.1(a) of the Agreement provides that the Plant "shall be new, free from defects and shall, judged by prudent international industry standards, be of good workmanship and materials and, under normal operating conditions, shall show no defect due to engineering, design, fabrication, materials and workmanship." Earlier this month BlueOak learned that the Plant fails to meet this standard on account of several serious design and other defects, including but not limited to:
>
> > Design failures related to maintaining sufficient alloy temperatures, ensuring adequate thermal balance, managing slag overflow, sealing the graphite electrode, managing dust, effectively conducting carbon thermal oxidization and providing a safe work environment.
> >
> > Engineering and related failures related to furnace temperature excursions ineffective dust conveyors on the off-gas system, an oft-plugged lime feeder, inadequate control of the E-Waste LIW feeder,

incompatible gas duct bolt-up flanges, inadequate components of the thermal oxidizer burner, failed weld seams on the E-Waste LIW bin, failed candle-filter components and furnace restart capabilities.

These defects further reflect that Tetronics has failed to provide services under the Agreement "consistent with good technical service practice" in contravention of its warranty in Section 9.1(b).

Moreover, because of the extent and significance of the referenced design defects, among other reasons, BlueOak has concluded that Tetronics did not exercise reasonable skill, care, and diligence in designing the Plant. Tetronics' failure to do so constitutes a breach of Section 2.2 of the Agreement.

Further, given the amount of time and resources necessary to address the design and other defects with the Plant, the Contract Security presently in place—a guarantee that expires on January 19, 2018—is inadequate under Section I0A of the Agreement, which requires Tetronics to maintain security through FAT. BlueOak cannot envision a realistic scenario whereby the referenced defects are corrected and the Plant is possibly ready to successfully complete FAT prior to February 12, 2018—the earliest FAT could occur according to the most recent Gannt chart provided by Tetronics. The guarantee (or any other acceptable Alternative Security) must remain in place at least through this date in order for Tetronics to meet its obligations under Section 10A.

BlueOak looks forward to receiving a plan from Tetronics to address the aforementioned defects and breaches. In light of the lengthy problems and delays with the Plant to date, as well as the terms of the Agreement, BlueOak must insist upon receiving such a plan no later than January 12, 2018.

As always, please do not hesitate to contact me to discuss how BlueOak might assist Tetronics in satisfying its obligations under the Agreement in a timely manner.

301. There are several matters to note about the Default Notice:[3]

[3] In addition to the notifications of breach of warranty, the Default Notice states that Tetronics has materially breached the covenant in Clause 2.2 of the Conditions to the Contract. This allegation of breach is discussed separately, below. The Default Notice does not expressly allege a present breach of Clause 10A, but states the position that the security would be inadequate if, as expected, the completion of work extended beyond the 19 January 2018 expiry date of the present security. In its letter of 26 December 2017, however, BlueOak clearly stated that it considered that the failure to place security extending beyond the current expiry date was a material breach. [CX-48] This allegation of breach also is discussed separately, below.

a. The Default Notice is clearly intended to constitute, and constitutes, the written notice of non-conformity with warranties required by the Contract in relation to both Clauses 9.1(a) and 9.1(b);

b. It does not separately refer to the warranty under Clause 2.3, which is consistent with the conclusion that the regime applicable to that warranty is subsumed with that applicable to the Clause 9.1(a) warranty;

c. As contemplated by Clause 9.1(a) Tetronics is invited to prepare and deliver a plan to correct the defects and breaches, and states that the plan should be provided by no later than 12 January 2018.

d. The Default Notice does not refer to the Clause 17.2 which gives rise to a right of termination for material breach if "within thirty (30) days of receipt from Buyer of notice of default under this Clause 17.2" Tetronics fails to "correct or cause to be corrected such default or make or cause to be made provision satisfactory [BlueOak] for correcting such default within a reasonable time thereafter;"

302. The evidence clearly shows that by 11 December 2017 Tetronics already had delivered a plan to remedy many of the defects described in BlueOak's Default Notice. On 29 November 2017, Tetronics had sent to BlueOak a package of information reporting on steps taken to implement agreed fixes. The parties met on 30 November 2017 to discuss the engineering fixes Tetronics proposed to implement and a revised Gannt Chart setting out the implementation schedule. [CX-038] This information was re-conveyed and expanded upon by Tetronics on 17 and 29 December, after the delivery of the Default Notice. [CX-047; RX-018]

303. Work in preparation for the implementation of the corrective measures was ongoing in England when the Default Notice was delivered, and continued thereafter in preparation for Tetronics' planned return to the site on 4 January 2018 to begin installation. BlueOak had in hand both details of the remaining corrective work that Tetronics planned to undertake and the timeline for its performance, in the form of a revised Gantt Chart. On 4 January 2018 Tetronics' team arrived on site, ready to work as soon as the furnace cooled and BlueOak provided information concerning certain changes it had made during Tetronics' absence. The Final Gantt Chart factoring in these matters was delivered. In the meantime, BlueOak made its demands for payment under the HSBC Bond, first on 2 January 2018 and then, successfully, on 11 January 2018. The evidence shows that Tetronics' team remained on site, completed the various modifications and were ready to re-start

the furnace when BlueOak issued its 12 February Termination Notice and asked the Tetronics team to leave the site. [CWS135 (Powell) ¶85]

304. With one possible exception discussed below, because of the steps it had taken after receiving the Default Notice, I find that Tetronics was not as of 12 February 2018 in breach of its obligations in respect of its warranties under Clauses 9.1(a), 9.1(b) or 2.3 of the Contract. Tetronics (i) had notified BlueOak of its plans and expected timetable in relation to the corrective work, (ii) was actively engaged in the design and engineering aspects of the corrective work, (iii) had ordered the necessary parts and equipment to be delivered and was preparing to commence the corrective work on site, and (iv) arrived on-site to perform the installation work, all within 30 days of receiving the Default Notice. Tetronics was diligently pursuing the completion of corrective works as soon as practicable.

305. The exception mentioned above is that Tetronics had clearly stated its position that the inability of the Second System to reliably and safely superheat metal alloy to 1600°C was not a defect. Tetronics clearly stated, on 17 October 2017 and again on 29 December 2017 that there was no requirement in the Contract in that regard. [RX-018,038] Tetronics presented no plan or timetable to correct this alleged defect. Tetronics' 29 December 2017 letter said: [RX-018]

> **1600 Deg.C Furnace Operation** The Furnace is designed and currently operates at 1600 Deg. C, meeting the required specifications. If BOA require the Plasma process to heat the alloy to a specific temperature that would require the furnace to operate above the 1600 Deg. C to satisfy downstream processing equipment not within Tetronics scope of supply, then this will be a variation to the Contract and Tetronics would be happy to offer a proposal to do so, through the appropriate Contract Variation mechanism taking into account any cost, schedule and performance implications.

306. If Tetronics' position was incorrect, then its refusal to provide a plan and timetable for corrective measures placed it in breach of its warranty obligation and was a repudiation of its obligation to correct the alleged defect. If Tetronics' position was correct, however, then there was not a breach of warranty obligation or a repudiation.

(i) Did the Contract Require the Second System to Heat Metal Alloy to 1600°C?

307. BlueOak contends that it was a requirement of the Contract that the Second System reliably and safely superheat metal alloy to 1600°C and that the Second System did

not and was incapable of meeting this requirement. [RPHB1 ¶¶154-199; RPHB2 ¶¶33-60] BlueOak submits that the Second System did not "comply with the Proposal and the Contract" as warranted by Clause 2.3 and did not conform to the Contract and Proposal as warranted under Clause 9.1(a). This result is alleged to have been caused by Tetronics failing to provide services that "conform with this Contract … judged by prudent international industry standards, consistent with good technical service practice" as required by Clause 9.1(b). [RPHB1 ¶134]

308. Tetronics contends that there is no requirement in the Contract that the Second System reliably and safely superheat metal alloy to 1600°C. [CPHB1 ¶¶1-5; CPHB2 ¶¶2-17, 58-72] Tetronics states that by the Contract the parties agreed to a furnace operating temperature of between 1300 and 1600°C. Tetronics contends, however, that the Contract does not require any specific alloy temperature. It submits that the Contract only requires that the furnace process e-waste input into a molten alloy rich in precious metal. Tetronics emphasizes that the FAT acceptance criteria forming part of the Contract do not include any requirement that the molten alloy be of any particular temperature.[4] [CPHB1 ¶¶71-75]

309. I have studied carefully the relevant parts of the Contract and the documents to which the parties have referred. I find that in the text of the operative agreement and the Conditions that form part of the Contract there is no promise or warranty explicitly stating that the alloy temperature will be 1600°C. [RX-001]

310. The Proposal was incorporated by reference into the FEED & Supply Contract as Schedule 4. Apart from two modifications described in Schedule B to Variation 02, the Proposal continues to be incorporated by reference into the Contract as amended by Variation 02. The first modification to the Proposal is inconsequential. The second modification is to replace the Furnace Operating Plan annexed to the

[4] Tetronics does not admit that the Second System, once commissioned, would have been incapable of meeting any such requirement. Tetronics submits that "it is unclear whether the furnace would have been able to consistently produce alloy of 1600°C at the tap … due entirely to BlueOak's conduct." [CPHB1 ¶107] Tetronics submits that the furnace achieved alloy temperatures of 1600°C or higher in its initial taps, and that the temperatures fell only after BlueOak "over-tapped" the furnace by withdrawing excessive amounts of alloy, thereby damaging the heat-retention capability of the furnace. [CPHB1 ¶¶108-113] Tetronics further submits that the ability of the furnace to produce 1600°C alloy was impaired by BlueOak having provided unsuitable feed material. [CPHB1 ¶¶117,118] Tetronics submits that the evidence "suggests that the furnace could have consistently hit alloy temperatures of 1600° Celsius when fully commissioned" and that "any doubts about that projection should be construed against BlueOak, as BlueOak prevented the furnace from actually being commissioned." [CPHB1 ¶114]

Proposal with a new Furnace Operating Plan which is annexed to Variation 02 as Annex 10 (**VA FOP**). [RX-001]

311. The VA FOP is a chart showing details of, among other matters, "Feed Rates", "Furnace Details", "Power Requirements", "Slag" and "Metal." Under the "Furnace Details" heading there is a line item for "Operating Temperature" which is stated to be 1600°C. Under the "Slag" and "Metal" headings there are various line items such as density, weight, depth, and time between taps, but no line items indicating the temperature of the slag or metal. [RX-001]

312. The Proposal included the PFD which is described as "[a] typical process flow diagram for the plasma system with indicative flows…." [CX-001] The PFD, and the table beneath it, indicate that the slag and the alloy would reach 1600°C. It includes an illustration showing a notional container of metal alloy after tapping at a temperature of 1600°C. The Contract as amended by Variation 02 contemplates, however, that final PFDs and final FOPs will be agreed during the subsequent design process. It states that there will be a Preliminary (**PDR**) and a Critical Design Review (**CDR**), the scope and agendas for which are shown in documents attached to Variation 02, which were added to the Contract as a new Schedule 14. The agenda for the CDR contained in Schedule 14 includes a review of "Final PFDs for first and second pass operations", "Final FOPs for first and second pass operations" and "Final composition and temperature projection of alloy and additional output streams such as slag." [RX-001]

313. BlueOak approved of the design as presented at the CDR. On 10 June 2016 Foster signed the CDR Acceptance Certificate attaching the meeting minutes. [RX-009; CX-025; CX-035; CWS70 (Powell) ¶22]

314. The evidence shows that at the CDR Tetronics made a slide presentation to BlueOak concerning the design of the system and its components. The presentation states in several places that the assumed liquidus temperature of the slag is 1400°C. The presentation included an explanation of process modelling that had been done and set out certain assumptions that formed the basis of the modelling. Two assumptions related to temperature: [RX-009]

> 3) Meltpool (bath) temperature - 1600^{o}C for both passes
> 4) Head space temperature: -

* 1450^{o}C for the first pass (cold freeboard) – as per original assumptions -
* 1550^{o}C for the second pass

For the purposes of the modelling, assumptions also were made about the composition of the e-waste to be fed into the system. [RX-009]

315. The actual modelling had been performed by external advisors to Tetronics based on input data provided by Tetronics. Minutes of the CDR prepared by Tetronics show that during the CDR, as contemplated by the Contract, Tomasz Stachowski, Tetronics' senior process engineer, reviewed with BlueOak representatives revised FOPs and PFDs based on the results of the modelling. [CX-035] The revised PFDs were dated 26 and 27 May 2016 (**CDR PFDs**). [RX-042,043] The CDR PFD's contain detailed charts relating to the "First Pass" and "Second Pass" operations, showing the properties of Second System inputs and outputs of various kinds. One data line under the heading "Physical Stream Properties" concerns "Temperature [°C]." The temperatures for slag and metal alloy are shown as "1600." [RWS5 (Foster) ¶¶12-20; CX-024, 035; RX-042,043]

316. I agree with Tetronics that the most relevant document included in the CDR presentation is a document entitled "Projected Composition of Molten Products" (**Alloy Projection**). [CX-010; CPHB1 ¶70] The agenda for the CDR contained in Schedule 14 to the Contract includes a review of (i) "Final PFDs for first and second pass operations", (ii) "Final FOPs for first and second pass operations" and (iii) "Final composition and temperature projection of alloy and additional output streams such as slag" (emphasis added). The Alloy Projection is the document that matches the third of these categories. It directly addresses not only the alloy composition but also alloy temperature. The Alloy Projection includes analytical text, not just unexplained figures. The Alloy Projection sets out detailed projected compositions (of weight and concentration) for numerous valuable metal species within "First Pass Alloy" and "Second Pass Alloy." In each case the "Target Operating Temperature" for the alloy is stated to be 1470-1530^{o}C. The Target Operating Temperature for both First and Second Pass Slag is stated to be 1600^{o}C. Powell and Conway refer to the Target Operating Temperatures for the alloy as the "target internal alloy temperature of the furnace." They state that during the CDR no-one suggested that projected alloy temperatures in the range of 1470-1530^{o}C were problematic. [CWS70 (Powell) ¶¶22-24; CWS72 (Conway) ¶¶34-36; CPHB1 ¶75]

317. The VA FOP, the CDR PFD's and the Alloy Projection all are parts of the Contract and they can, indeed must, be taken into account. After carefully considering all of the documents comprising the Contract, I find that the Contract does not contain any covenant or warranty that the Second System would reliably and safely superheat the metal alloy to 1600°C as BlueOak contends. To be clear, while the parties clearly were *ad idem* that the design operating temperature of the Second System would be 1600°C, I do not find that there was an agreement that the design would ensure any particular alloy temperature. The Contract documents do not support a finding that BlueOak proposed or Tetronics expressly, or even implicitly, promised or warranted that the Second System would reliably and safely superheat metal alloy to 1600°C.

318. In support of its interpretation of the Contract, BlueOak seeks to rely on extrinsic evidence, including: [RPHB1 ¶¶161-179]

    a. evidence that on 7 October 2015, before the failure of the First System, Foster sent Tetronics' a draft Granulation Standard Operating procedure (**Granulation SOP**) and Economy Industrial's Granulation Manual (**Granulation Manual**) which explained the importance of alloy temperature and the need (for effective granulation) of a minimum temperature of 150°C above the liquidus temperature needed for granulation (which it said was 1450°C, assuming a specific alloy composition). [CX-007; CX-008]

    b. Evidence of post-contractual efforts by Tetronics, without protest that it was not contractually required, to satisfy BlueOak's demand that alloy not be tapped until the alloy temperature of 1600°C or 1550°C was achieved;

    c. A statement in the 4 May 2017 OM Manual that "[t]he plasma power input is adjusted by the End User, to ensure a constant melt temperature of around 1500°C to 1700°C with the target being 1600°C;" [RX-024] and

    d. The OGN dated 17 June 2017 prepared by Tetronics and sent to BlueOak stating: [RX-025]

        > For this alloy to be acceptable for the off-take arrangement with the final refiner is must be granulated and this means when it is tapped from the furnace it must be slag 'free' and should start its journey at a temperature of close to 1600 °C. This is the temperature within the

furnace as assessed using the long Heraeus probe and not that outside the furnace.

319. The extrinsic evidence that BlueOak seeks to rely upon, even if it were admissible (which it is not), is not convincing. For example, the Granulation SOP prepared by BlueOak, which places a heavy emphasis on safety, includes a description of "Important Control Parameters" which included a "normal" alloy temperature of 2550°F a "minimum" alloy temperature of 2375°F and a "maximum" alloy temperature of 2900°F. These are equivalent to "normal" 1398°C, "minimum" 1301°C and "maximum" 1593°C. [CX-008]

320. There is no evidence that the granulation documents were studied or discussed between Tetronics and BlueOak. Even if the law permitted one to do so (which it does not) one cannot extrapolate from the statements made in the Granulation SOP and Manual a conclusion that the Contract for the Second System is meant to include a warranty or covenant by Tetronics that the alloy temperature would be 1600°C.

321. Similar frailties exist with the other extrinsic evidence on which BlueOak seeks to rely. For example, when read in context the statement in the 4 May 2017 OM Manual about ensuring "a constant melt temperature of around 1500°C to 1700°C with the target being 1600°C" is entirely consistent with the objective of achieving an operating temperature of 1600°C and does not relate directly to the alloy temperature. That document, and the OGN, were prepared after attempts at commissioning had begun, and during the time when BlueOak was insisting on a 1600°C alloy tapping temperature and Tetronics was attempting to satisfy that requirement. Evidence of that post-contractual conduct, even if admissible, is not determinative of the what the parties had agreed must be done in the Contract. When it became evident that meeting BlueOak's demand would stand in the way of achieving commissioning, Tetronics reviewed the Contract and clearly stated its position that compliance with BlueOak's demand was not required.

322. In any event, none of the extrinsic evidence on which BlueOak seeks to rely is admissible under New York law. As described above, under New York law, extrinsic evidence is admissible only where a contract contains an ambiguity. [See, e.g. CLX-41, *Schron v. Troutman Sanders LLP*, 986 N.E.2d 430 (N.Y. 2013); CLX-42, *Wayland Inv. Fund, LLC v. Millenium Seacarriers, Inc*., 111 F.Supp.2d 450 (S.D.N.Y.2000); CLX-43, *Sunrise Med. HHG, Inc. v. Health Focus of N.Y.*, No. 01–CV–597, 2005 WL 357203, 2005 U.S. Dist. LEXIS 2045 (N.D.N.Y. Feb. 15, 2005)]

323. There is no ambiguity in the Contract. Tetronics has not identified any word or phrase in the Contract that requires interpretation and which is equally capable of having two different meanings. In substance, BlueOak seeks to add to the Contract, rather than to explain or interpret what the Contract already says. New York law and Clause 18.2 of the Conditions to the Contract prevent BlueOak from relying on extrinsic evidence to add to the Contract when there is no ambiguity. [See, e.g. CLX-44, *Investors Ins. Co. v. Dorinco Reinsurance Co.,* 917 F.2d 100, 104 (2d Cir.1990); See also CLX-45, *Battery Steamship Corp. v. Refineria Panama, S.A.,* 513 F.2d 735, 738 n. 3 (2d Cir.1975); CLX-47, *W.W.W. Associates, Inc. v. Giancontieri*, 77 N.Y.2d 157, 162; 565 N.Y.S.2d 440; 566 N.E.2d 639 (N.Y. 1990)]

324. Clause 18.2 of the Conditions to the Contract states (emphasis added): [RX-001]

> **18.2 Entire agreement**
>
> (a) This Contract sets out the entire agreement and understanding between the Parties and supersedes all prior agreements, understandings or arrangements (whether oral or written) in respect of the subject matter of this Contract, except for the Licence Agreement.
>
> (b) Each Party acknowledges that:
>
> (i) upon entering into this Contract, it does not rely, and has not relied, upon any representation (whether negligent or innocent), statement, warranty or other term made or agreed to by any person (whether a Party to this Contract or not) except those contained in this Contract and the Licence Agreement;
>
> (ii) without prejudice to the effect of subparagraph (a), the only remedy available in respect of any misrepresentation or untrue statement made to it shall be a claim for damages for breach of contract under this Contract and, to the extent that any such representation or statement is not contained in this Contract, then it shall be deemed to be contained for the purpose of applying this provision; and
>
> (iii) this clause shall not apply to any statement, representation, or warranty made fraudulently, or to any provision of this Contract which was induced by fraud for which the remedies available shall be all those available under the law governing this Contract.

(j) Conclusion Re: Whether the Contract Required an Alloy Temperature of 1600°C

325. I find that Tetronics did not, by Clauses 9.1(a), 9.1(b) or 2.3 warrant that the temperature of metal alloy would consistently be 1600°C or that the Second System had been designed or equipped with a view to achieving that result.

(k) Conclusion Re: BlueOak's Breach of Warranty Claims

326. For the reasons I have stated, I find that Tetronics did not breach its warranty obligations in relation to Clauses 2.3, 9.1(a) and 9.1(b) as alleged.

327. As a result of this conclusion it is not necessary for me to address several alternative arguments made by Tetronics, including the submission that, with only a few exceptions, the Default Notice was untimely to serve as notice of breach of warranty because "it raised points of a historic nature that had been known about, and in some cases already resolved, prior to the BlueOak letter dated 13 November 2017." [CWS69 (Rumbol) ¶¶32-42]

(D) Tetronics' Alleged Breach of Clause 2.2 and the Alternative Claim for Professional Negligence

(a) The Parties' Contentions

328. Clause 2.2 of the Contract states:

> 2.2 In carrying out the design of the Plant, the Seller shall exercise reasonable skill, care and diligence.

329. BlueOak contends that Tetronics breached Clause 2.2 of the Conditions in the Contract by failing to exercise reasonable skill, care and diligence when designing the Second System. It submits that the Second System "had immediate and continuing problems operating, and central components were defective, dangerous, and/or unusable." [RM1 ¶99]

330. This issue of contractual liability is linked factually to BlueOak's alternative claim that Tetronics committed professional negligence and malpractice because the Second System that it designed and installed was dangerous and defective as a result of Tetronics' "failure to adhere to accepted standards of practice." [RPHB1 ¶249; RM1 ¶¶159-164; RM2 ¶¶204-211; RM3 ¶112]

331. In support of these allegations BlueOak relies generally on the same alleged defects and deficiencies that are the subject of its warranty claims, but emphasizes the allegedly insufficient design of the Off-Gas System and the inability to achieve consistently an alloy temperature of 1600°C. [RM1 ¶¶100-114; RPHB1 ¶134,154; RPHB2 ¶¶13,25-33]

332. To establish a breach of Clause 2.2, BlueOak must show that Tetronics failed to "exercise reasonable skill, care and diligence" in designing the Second System. To establish that Tetronics was negligent in performing the design BlueOak must show that Tetronics departed from accepted standards of practice. [RLX-005, *Kung v. Zheng*, 73 A.D.3d 862, 863, 901 N.Y.S.2d 334, 335 (N.Y. App. Div. 2010) ("A claim of professional negligence requires proof that there was a departure from the accepted standards of practice and that the departure was a proximate cause of the injury.").

333. BlueOak submits: [RPHB1 ¶136]

> BlueOak has submitted the opinions contained in Hatch's reports, as well as the testimony of Messrs. Sauter and Foster to provide the accepted standards of practice in the metallurgical industry with which Tetronics failed to comply. These opinions include, *inter alia*, Hatch's assessment that the furnace could not reliably heat the metal alloy to 1600 degrees Celsius and the off-gas system was not fit for purpose as well as Mr. Foster's opinions that Tetronics daily site reports fell below industry standards (particularly with respect to root cause analysis) and that Tetronics' practice of re-starting the furnace with re-bar was unsafe and improper.

334. Tetronics contends that BlueOak has tendered no credible evidence that in designing the Second System Tetronics breached the contractual standard of care or departed from accepted standards. [CPHB2 ¶¶50-52] Tetronics also advances a series of alternative arguments, as set out earlier in this award.

(b) Analysis: The Evidence Concerning the Standard of Care

335. BlueOak tendered two witness statements of Daan Sauter of Hatch. Sauter authored the Final Hatch Cold Alloy Report. [RX-015] His Hatch colleague, Jason Nikkari, authored the Final Hatch Off-Gas Report under Sauter's general supervision. [RX-016] The two Final Hatch Reports were attached to Sauter's first witness statement. [RWS007 (Sauter)] BlueOak emphasizes that Sauter was

tendered as a fact witness not as an expert witness. [TR Day 6 (Counsel) p.8] In his second witness statement, Sauter stated (emphasis added): [RWS008 (Sauter) ¶8]

> The Hatch Report was created based on narrow engagement terms and parameters, as set forth in the parties' Agreement and clarified in the Hatch Reports themselves. Hatch was not asked to opine on BlueOak Arkansas or Tetronics' contractual performance.

336. The two Final Hatch Reports do not express an opinion on the question of whether Tetronics exercised reasonable skill, care and diligence or departed from accepted standards of practice. Sauter did not express an opinion on that subject in his oral testimony.

337. Garas' evidence concerning his initial instructions to Hatch is that "[m]y instructions to Hatch were simple: assuming an unlimited budget, what can be done to get the furnace to operate safely and reliably." [RWS001 (Garas) ¶27] The evidence shows, however, that in response to questions from BlueOak's Board, when preparing the final versions of the two Hatch Reports, Garas asked Sauter to include language stating that part of its mandate was to use "prudent international industry standards to identify any defects in workmanship, materials or any defects resultant from engineering or designs of the FOP." Hatch refused to include that language, with Sauter explaining "we were brought in to identify issues with the purpose of helping BlueOak to move forward and make the plant profitable, not to look back and place blame." [CX-195]

338. The only independent witness to opine directly on the question of whether Tetronics failed to meet the requisite standards when designing the Second System is Tetronics' expert, Alan Gibbon. He states: [CXR177 (Gibbon Second Expert Report) ¶58]

> Tetronics' design of the plasma arc Furnace met the standard of care – in other words, in designing, installing and commissioning the plasma arc Furnace, Tetronics exercised the skill and care that a reasonably careful engineer/designer would have used in similar circumstances.

Gibbon does not explain the foundation for his opinion, and his relevant expertise is limited, and for that reason cannot be given substantial weight. However, his evidence stands unrebutted.

339. In effect, based on evidence that Hatch identified deficiencies with the capabilities of the Second System at the time it performed its work and recommended a different approach, BlueOak asks that I infer that those deficiencies must be attributable to Tetronics' failure to meet the contractual or tort standard of care when carrying out its design. I find that it is inappropriate to make that leap.

340. First, BlueOak had every opportunity to present evidence, including independent expert evidence, squarely addressing the standard of care issue, but it did not do so. Second, the fact that Hatch expressly resisted a request to express an opinion that Tetronics' design failed to meet the requisite standard would, if anything, lead me to infer that Hatch's opinion, if expressed, would not have supported BlueOak's contention. Third, the fact that Garas instructed Hatch to assume "an unlimited budget," means that Hatch's recommendations were unconstrained by the financial parameters of the Contract. The Contract did not allow Tetronics to provide a design using an "unlimited budget." Fourth, as a result of my finding that the Contract did not require the delivery of a system that could reliably and safely heat metal alloy to 1600°C, the Final Hatch Cold Alloy Report, explaining why that had not been achieved is of limited, if any, relevance. Fifth, Hatch did not address in the Final Hatch Off-Gas Report the adequacy of the fixes that Tetronics and its external engineers proposed to implement. Sixth, the evidence shows that the Second System was, as both parties knew, a first-of-kind bespoke facility. That unusual context, and its bearing on any after-the-fact assessment of design decisions, was not addressed by any evidence. Seventh, to draw the inference BlueOak seeks would be contrary to the only expert evidence directly on point.

(c) Conclusion Re: Standard of Care

341. For the reasons I have stated, I find that BlueOak has failed to establish the relevant contractual and tort standards of care or that Tetronics breached such standards.

(d) Analysis: BlueOak's Additional Allegations of Professional Negligence

342. In his fourth witness statement, Foster gave evidence that was intended to establish that Tetronics inaccurately recorded or omitted facts in its daily site and incident reports. [RWS14 (Foster) ¶¶7-12] Evidence of inadequate reporting, even if accepted would not establish an instance of a failure to exercise reasonable skill, care and diligence "in carrying out the design of the Plant" so as to contravene

Clause 2.2. This allegation and several others must, however, be considered in the context of BlueOak's professional negligence claim.

343. Foster expressed the view that Tetronics' reporting practices fell short of usual industry practices, stating "[I]n my opinion, Tetronics' practice of inadequate and incorrect reporting did not comply with its duty of reasonable care and professionalism owed to BlueOak as the alleged e-waste expert." [RWS14 (Foster) ¶13]

344. Tetronics objects to the admissibility of this part of Foster's evidence, as it purports to be new opinion evidence, which, if it was to be tendered at all, was required to be tendered long before BlueOak's fourth and final Memorial. Tetronics states that it was thereby denied any opportunity to respond to the evidence with independent expert evidence. Tetronics also objects to the evidence being given any weight as it is self-serving opinion evidence from a non-independent witness. [CPHB1 ¶¶50, 51]

345. As evidence that Tetronics committed professional negligence independent of the design, I find Foster's evidence unconvincing. While a lack of independence is not in itself determinative of reliability, I find that in this instance Foster has assumed the role of advocate. I also assign it little weight in the light of its untimeliness and the justifiable concerns of prejudice stated by Tetronics.

346. In several of his witness statements Foster criticizes the procedure Tetronics adopted on occasion to re-start the furnace after a shut-down during the attempts to commission the Second System. In his second witness statement he states: [RWS005 (Foster) ¶43]

> … the procedure Tetronics adopted to re-start the furnace was rudimentary at best: when the plasma arc tripped, Tetronics would essentially open the top of the blistering hot furnace and throw in a section of railroad track welded to a steel pipe (a "fire cracker") to re-establish the arc. This practice was not only dangerous, but it was also completely outside of the contractual parameters of how the furnace was designed to operate. I complained on multiple occasions about the safety of this procedure, but Tetronics insisted that they were the experts and operators of the furnace.

347. The evidence shows that, during commissioning attempts, the Second System frequently shut down and that Tetronics used firecrackers to re-start the furnace. BlueOak links the use of firecrackers to the furnace design by alleging that Tetronics

failed to provide a furnace with "rapid heat up and cool down" capabilities, as "promised" in the Contract. [RPHB1 ¶¶209-211] As I understand it, the contention is that the need to use firecrackers to re-start the furnace is inconsistent with a "rapid heat up" capability and was a dangerous procedure that had to be used to compensate for a flawed design.

348. The evidence shows that BlueOak eventually accepted the use of firecrackers as a re-start mechanism for planned outages, provided that the operation manual would be amended to instruct employees on the steps in the procedure to mitigate safety concerns. Such instructions were prepared but the evidence does not establish whether they were or were not delivered. BlueOak did not agree that the process was suitable for unplanned outages. [RX-089, 090, 092, 097]

349. The only reliable evidence on the subject of whether the use of firecrackers is or is not indicative of a failure to meet the contractual or tort standards for design is that of Tetronics' expert, Anthony Hartwell. Hartwell opines that "firecrackers" are "commonly used to re-establish the arc quickly after an extended loss of power." Hartwell states that "firecrackers are the standard method used in these circumstances, and moreover, the quantity of iron added from the firecrackers would have had only a negligible impact on the composition of the alloy in the furnace (0.3% or less)." [CXR176 (Hartwell Third Expert Report) ¶23.]

350. I accept Hartwell's evidence on this subject. I find that BlueOak has failed to establish that the need to use firecrackers is evidence of a failure to meet the contractual or tort standard of care in relation to the design of the Second System.

351. The Second System was designed and intended to operate as a plasma arc furnace, in which the electrodes were suspended over the meltpool, rather than being submerged in the meltpool. Despite this, the evidence shows that during the efforts to achieve commissioning, Tetronics began to operate the furnace with the electrodes submerged. BlueOak contends that this is evidence that the design of the Second System was flawed. [RPHB1 ¶¶204-208]

352. The evidence shows that the submerged electrode was a temporary measure adopted in response to BlueOak's refusal to tap the furnace until the alloy reached 1600°C. Although Tetronics would have preferred not to take this step, in the hope of satisfying BlueOak's requirement and achieve commissioning, the decision was

made to temporarily submerge the electrode, which would enable the transfer of more heat to the alloy. [CWS136 (Deegan) ¶¶23-25; CWS137 (Conway) ¶¶34-39]

353. I agree with BlueOak that if there were a contractual requirement to design a suspended electrode furnace such that it could achieve consistently a 1600°C metal alloy tapping temperature, then a necessity to use submerged rather than suspended electrodes in order to reach that objective would have been evidence of a design flaw. I have found, however, that there is no such contractual requirement.

354. The evidence also shows that the use of submerged electrodes is a common practice in the industry. The submerged electrodes result in a submerged arc rather than a plasma arc. This submerged arc mode is a standard method of operating a furnace that is widely used in the industry. [CWS136 (Deegan) ¶¶23-25; CWS135 (Powell) ¶¶25-26.] The submerged arc operation is not a less safe mode of operating a furnace than the plasma arc method. [TR Day 4 (Gibbon) p.226] Foster acknowledged that there is "[n]ot anything technically wrong" with a submerged electrode operation. [CX-203; TR Day 6 (Foster) p. 125]

355. I find that the use of submerged rather than suspended electrodes was a temporary good faith effort by Tetronics to accommodate BlueOak's contractually unjustified insistence that the metal alloy not be tapped until the temperature reached 1600°C. I find that the temporary use of the submerged electrode mode is not evidence of faulty design. As the evidence shows that submerged arc operation is a safe, common practice in the industry, adopting its use in this instance does not amount to professional negligence.

(e) Conclusions Re: Additional Allegations of Professional Negligence

356. For the reasons I have stated, I find that BlueOak has failed to establish that Tetronics failed to exercise reasonable skill, care and diligence in carrying out the design of the Second System or failed to adhere to accepted industry standards of practice in relation to the design of the Second System. BlueOak has not proven that Tetronics breached Clause 2.2 of the Contract or committed acts of professional negligence.

(E) Tetronics' Alleged Breaches of the Implied Covenant of Good Faith

(a) The Implied Covenant Under New York Law

357. A duty of good faith and fair dealing is implied in all contracts under New York law. [RLX-013, 511 *West 232nd Owners Corp. v. Jennifer Realty Co.,* 773 N.E.2d 496, 500 (N.Y. 2002); RLX-004, *Security Plans, Inc. v. CUNA Mut. Ins. Soc'y*, 769 F.2d 807, 817-18 (2d Cir. 2014); CLX-69, *Emmet & Co., v. Catholic Health East,* 16 N.Y.S.3d 154, 167 (N.Y. Sup. Ct. 2015)] The implied covenant is breached when a party to a contract acts in a manner that, although not expressly forbidden by any contractual provision, would deprive the other party of the right to receive the benefits under their agreement. [CLX-70, *P.T. & L. Contracting Corp. v. Trataros Constr., Inc*., 29 A.D. 3d 763; 816 N.Y.S.2d 508 (N.Y. App. Div. 2006)]

358. An alleged breach of the covenant of good faith does not give rise to a separate cause of action. [CLX-66, *Caplan v. Unimax Holdings, Corp.,* 591 N.Y.S.2d 28, 29 (N.Y. App. 1992). A plaintiff may allege bad faith as part of its breach of contract claim, but bad faith does not provide an independent basis for recovery. [CLX-67, *Quail Ridge Associates v. Chemical Bank*, 558 N.Y.S.2d 655, 657 (N.Y. App. Div. 1990). See also CLX-65, UCC §1-304, cmt. 1 "[T]his section means that a failure to perform or enforce, in good faith, a specific duty or obligation under the contract, constitutes a breach of that contract or makes unavailable, under the particular circumstances, a remedial right or power."]

359. Under New York law, a claim for breach of the implied covenant is not cognizable and should be dismissed where the claim is "duplicative of the breach of contract claim when both claims arise from the same facts." [CLX-23, *3839 Holdings, LLC v. Farnsworth*, No. 65446/2016, 2017 Westlaw 5649812 (N.Y. Sup. Ct. Nov. 24, 2017) citing to CLX-25, *Logan Advisors, LLC v. Patriarch Partners, LLC,* 63 AD3d 440, 443; 879 N.Y.S.2d 463 (N.Y. App. Div. 2009)]

(b) BlueOak's Contentions Regarding Breach of Implied Covenant: 1600°C Alloy Temperature

360. In its First and Second Memorials, BlueOak argued that Tetronics breached its duty of good faith by wrongly denying that the Contract contained a requirement that metal alloy consistently be heated to a tapping temperature of 1600°C. In its Third Memorial BlueOak alleged that Tetronics breached its duty by, *inter alia*, "unilaterally deviating from the mutual agreement in the Contract when it arbitrarily determined that the furnace did not need to heat the alloy to 1600°C …." [RM1 ¶¶124-129; RM2 ¶187; RM3 ¶104] My finding that the Contract did not require an alloy temperature of 1600°C is fatal to these claims. Had I made the

opposite finding, then the good faith claim would have been entirely duplicative of BlueOak's claims for breach of the express provisions of the Contract and, as such, not cognizable under New York law.

361. In its First Post-Hearing Brief, however, BlueOak characterizes the claim for breach of duty of good faith as an alternative argument (emphasis added): [RPHB1 ¶¶222, 223]

> 222. BlueOak has argued that – only to the extent the Sole Arbitrator finds that the 1600 degrees Celsius parameter was not a contractual provision – Tetronics has violated this covenant by accepting 1600 degrees Celsius (and, later, 1550 degrees Celsius) as the temperature for the metal alloy prior to the tap for many years and then unilaterally disavowing it because its System could not perform as designed. BlueOak hereby refers the Sole Arbitrator to the sections in the memorials that focus on this particular issue.
>
> 223. At the Final Hearing, Tetronics' witnesses testified that they worked with BlueOak to meet the 1600 degrees Celsius parameter for both Systems and Mr. Garas confirmed that BlueOak relied on this specification when selecting and designing the downstream equipment to process the alloy. Accordingly, Mr. Rumbol's October 17, 2017 e-mail that announced for the first time that Tetronics no longer believed 1600 degrees Celsius to be the target temperature for the metal alloy had the effect of making the downstream process worthless and defeated the purpose of the System that BlueOak bargained for under VA02.

362. This review of BlueOak's submissions shows that this part of its bad faith allegation has evolved. It is framed now as an alternative allegation, relying not on a contractual requirement but on an expectation allegedly created by Tetronics' conduct and relied upon by BlueOak.

(c) Analysis Re: Breach of Implied Covenant: 1600°C Alloy Temperature

363. There are both factual and legal difficulties with BlueOak's re-cast claim. First, the evidence does not show that Tetronics "accepted" that the metal alloy should be heated to 1600°C. It shows that Tetronics sought during the efforts to achieve commissioning to accommodate BlueOak's demand to meet a requirement that was not in the Contract. Tetronics did not agree to waive its contractual rights or agree to add to them.

364. The evidence also does not show that BlueOak relied on Tetronics' conduct when designing the downstream process. The evidence shows that BlueOak independently committed to the use of the granulator – which ultimately drove its desire for a 1600°C alloy temperature - before installation of the First System was completed, before Variation 02 was executed and long before any efforts were made to commission the Second System.

(d) Conclusion Re: Breach of Implied Covenant: 1600°C Alloy Temperature

365. In these circumstances, I do not find that Tetronics acted in bad faith when, after attempting to accommodate BlueOak, it insisted on adherence to the Contract. Second, I find that BlueOak is seeking to add a new term to the Contract, rather than to moderate the manner in which Tetronics performed the Contract. For these reasons, I find that BlueOak has not established that BlueOak breached its duty of good faith in this regard.

(e) BlueOak's Contentions Regarding Breach of Implied Covenant: Additional Alleged Breaches

366. In its Third Memorial, BlueOak gathers under the rubric of bad faith several additional instances of alleged misbehaviour by Tetronics. BlueOak states: [RM3 ¶104]

> Tetronics breached its implied warranty of good faith and fair dealing by … (ii) drafting self-serving and deceptive daily site reports, (iii) refusing to amend its reports when confronted, (iv) refusing to cooperate with BlueOak to hire a professional advisor and attempt to remedy the problems created by Tetronics' design, and (v) by abandoning BlueOak and its furnace.

367. In its First Post-Hearing Brief, after referring to the alleged breach of covenant concerning the alloy temperature, BlueOak states: [RPHB1 ¶224]

> 224. Tetronics has also breached this covenant in a separate manner. The evidence shows Tetronics tried to re-write contract terms *post hoc* and refused to release the performance bond in November 2017 absent an agreement by BlueOak to make an additional payment of £916,000, despite its admitted failure to achieve any of the contract performance milestones. Mr. Rumbol also sought to have these proposed changes become binding upon the parties by seeking a variation order modifying the performance milestones and deadlines.

368. I deal with these further alleged instances of breach of the implied covenant in the following paragraphs.

(f) Additional Alleged Breach of Implied Covenant: Deceptive Site Reports

369. BlueOak submits that Tetronics engaged in a pattern of delivering site reports that minimized its own design failures and attempted to shift responsibility to BlueOak operating personnel. This allegation, however, is supported by evidence of a single incident, relying on two Exhibits. [RM1 43-45, 144; RM2 12, 107,108; RX-052, 057]

370. The evidence shows that Tetronics' view was that (BlueOak's) operator error was the root cause of the incident. This was reflected in Tetronics' initial site report. The parties then met to discuss the matter, and agreed that a design error which had resulted in a 20 second alarm delay was a contributing factor. Foster asserted that the report should be revised to show this. Deegan revised the report to refer to a "sub-optimal" alarm setting. It remained his view, however, that operator error was the root cause. Foster said that operator error was being unduly emphasized. He insisted that the report be revised to make a specific reference to the "20 second" alarm setting. [RX-057] The report was revised as requested. [CX-122]

(g) Conclusion Re: Deceptive Site Reports

371. I find that there was a *bona fide* difference of opinion about the root cause of one incident. There is no evidence of concealment of design flaws. The assertion that Tetronics refused to correct the specific report is not correct. There is no factual basis for BlueOak's allegation of bad faith site or incident reporting by Tetronics.

(h) Additional Alleged Breach of Implied Covenant: Refusal to Cooperate in Hiring an Outside Advisor for BlueOak

372. On 13 July 2017, Foster recommended to Garas that BlueOak consider engaging outside expert advisers as he perceived that Tetronics did not have the necessary technical expertise to solve issues with the control of the gas phase temperature which was maintained by water injection. Foster suggested to Garas that BlueOak "go around Tetronics" to look for a solution. He named several possible candidates to act as external advisers, including Hatch. [RX-050] Foster's assessment was sent to Tetronics with an email stating (emphasis added): [RX-050]

> Ahab has requested that I forward this and see if you want to participate with BlueOak on the assessment or if we should pursue this in parallel to your efforts. Naturally I recognize you may not agree with our assessment and your comments are welcome regardless.

373. Internal emails show that Powell, Tetronics' Project Manager, considered that Foster was expressing a "knee-jerk reaction" based on an incomplete understanding of the facts and a general lack of trust in Tetronics' technical capabilities, all of which Powell found "incredibly frustrating." [RX-050]

374. At meetings on 19 July 2019 Garas confirmed BlueOak's intention to hire another engineering firm to undertake a "process review and thermal balance" on the furnace. BlueOak invited Tetronics to participate in the process review. Tetronics indicated that it did not agree that a third-party engineer was required and that it did not wish to participate. [RX-051].

375. It was not until October 2017 that BlueOak proceeded to engage Hatch. On 3 October 2017, Rumbol emailed Garas asking what Hatch was doing on-site and why they were making suggestions about how the furnace should be operated. Rumbol said "[c]an I once again remind BOA of their confidentiality obligations and that any access to the furnace design or process information can only be provided with our permission which has not been given." Garas responded saying "[w]e are well aware of our obligations to maintain confidentiality and I think Hatch will be very helpful in proving out our phase II plans." He said the "Hatch should not be engaging your team at all." [RX-053] In his oral evidence Garas explained that phase II was a possible plant upgrade that BlueOak was considering once the Second System was operational. [TR Day 6 (Garas) pp. 54,55]

376. On 3 October 2017, Stachowski, Tetronics' senior engineer, was invited to join a meeting between Hatch and BlueOak to hear some thoughts of Hatch about a problem experienced in recent days in achieving BlueOak's desired alloy temperature. He was told by BlueOak that "Hatch's presence on site was mainly linked with some other equipment BOA was planning to install." [RX-054]

377. There are both factual and legal difficulties with BlueOak's contention that Tetronics breached its implied duty of good faith by refusing to co-operate in the hiring of an outside advisor. First, the evidence shows that BlueOak gave Tetronics the choice to participate in the hiring or not. Second, the evidence shows that Tetronics was genuinely sceptical about the need to hire an outside expert, and communicated

that fact to BlueOak, so that Tetronics was not acting arbitrarily or with a view to defeating BlueOak's objectives. Third, BlueOak was not prevented from engaging a third-party engineer and in fact did so. Fourth, BlueOak twice represented to Tetronics that Hatch was engaged primarily to address matters other than the design or operation of the Second System.

(i) Conclusion Re: Refusal to Cooperate in Hiring an Outside Advisor for BlueOak

378. For the reasons I have stated, I find that Tetronics did not reach a duty of good faith by declining BlueOak's invitation to participate in hiring an external advisor.

(j) Alleged Additional Breach of Implied Covenant: Abandoning BlueOak and the Second System

379. In its First Memorial, BlueOak contended that on 17 October 2017, "the Tetronics staff and management abandoned the BlueOak site and returned to the United Kingdom." It contended that although Tetronics' purported reason for returning to England was "to determine what was wrong with the design and how to make it work," in fact Tetronics "knew by this time that its furnace design was irreparably flawed and could not be commissioned." [RM1 ¶53] In its Second Memorial, Tetronics repeated these allegations in its Second and Third Memorials. [RM2 ¶¶194, 195; RM3 ¶8] These arguments were not repeated in Respondents' Post-Hearing Briefs, but they also were not expressly abandoned.

380. The evidence clearly shows that Tetronics' departure from the site in October was pre-planned and agreed by the parties, that it was in fact for the purposes of developing corrective measures to address a number of performance issues, that Tetronics did in fact develop corrective measures and, as planned, returned to the site in early January 2018.

381. The evidence also does not establish BlueOak's contention that by October 2017 Tetronics knew that the furnace was irreparably harmed. BlueOak submits that during the meeting attended by Powell, Hatch identified "myriad deficiencies in the furnace's design" and that Stachowski stated that these "were actually very much in line with the conclusions" Stachowski himself had reached. BlueOak submits that "Tetronics never disclosed to BlueOak Mr. Stachowski's conclusions that the furnace design was irreparably flawed." [RM1 ¶51]

382. I do not accept BlueOak's characterization of what occurred. According to Stachowski's report of the meeting, what Hatch suggested was that Tetronics "should really consider some changes to the slag chemistry (an addition of alumina was vaguely suggested)." It was this suggestion with which Stachowski agreed and which aligned with the views he already had expressed. He proposed to proceed with the addition of alumina to see if it worked. [RX-054] Hatch did not state and Stachowski did not agree that the design of the furnace was irreparably flawed and Tetronics did not with-hold any such information.

(k) Conclusion Re: Abandoning BlueOak and the Second System

383. For the reasons I have stated, I find that there is no merit to BlueOak's contention that Tetronics abandoned the site or that Tetronics breached a duty of good faith by returning to England to plan and design corrective measures in October 2017.

(l) Alleged Additional Breach of Implied Covenant: Insisting on an Additional Payment of £916,000

384. In their First Post-Hearing Brief, Respondents state: [RPHB1 ¶112]

> 112. On November 21, 2017, Tetronics finally posted the bond but refused to release the original copy to BlueOak unless it agreed to: (i) a "Side Letter" to advance an unearned payment to Tetronics for £916,000; and (ii) a change variation order revising the deadlines and deliverables to make it easier for Tetronics to pass FAT. For example, Tetronics tried to remove the PAT obligation, revise the GANTT chart, require another advance of an unearned milestone payment, and required BlueOak to pay Tetronics' suppliers directly from the dispersal account. BlueOak refused to comply with these extortive demands.

385. The evidence shows that in October and November 2017 Tetronics was making efforts to obtain a new bond from HSBC and BlueOak was anxious to have the new bond in place. In his first witness statement Rumbol said that before delivering a new bond "Tetronics (*sic*) shareholders required certain interim payments be made by BlueOak." [CWS69 (Rumbol) ¶32] In conjunction with their discussions about the form of Comfort Letter, Garas and Rumbol discussed a proposal by Tetronics that, in addition to other Contract modifications, once the HSBC Bond was issued BlueOak would make an early payment of £916,000 to Tetronics on account. While Garas ultimately supported the proposed agreements, he needed BlueOak's Board

approval. [CX-82, CX-205; RWS3 (Garas) ¶¶9-24; CWS142 (Rumbol) ¶7; CWS69 (Rumbol) ¶¶30-37; RX-086]

386. Rumbol's initial oral evidence was that HSBC required that BlueOak authorize an advance payment to Tetronics as a condition of issuing the HSBC Bond. Rumbol later explained, however, that while an advance payment was not an express pre-condition of HSBC, Tetronics had overcome hesitation on the part of HSBC by telling it that such a payment would be forthcoming when the bond was issued. For these reasons, Tetronics was not prepared to deliver the HSBC Bond until it was sure that this expectation would be fulfilled. [TR Day 2 (Rumbol) p. 204, Day 3 (Rumbol) pp. 31-33]

387. Rumbol arranged for the HSBC Bond to be issued. He intended to with-hold delivery until the requisite BlueOak Board approval was obtained. To satisfy BlueOak that the HSBC Bond was in fact in place, he sent Garas a copy of the HSBC Bond, incorrectly assuming that BlueOak could not call the HSBC Bond without possession of the original. [CWS184 (Rumbol) ¶¶11,12]

388. Under Clause 10A of the Conditions to the Contract, Tetronics was required to "use reasonable efforts to extend the duration of the Advance Payment Bond in the reduced amount of £3,080,000 to successful completion of FAT." The fact is that the HSBC Bond was delivered as soon as it was issued. BlueOak was able to use the copy of the HSBC Bond that it received from Rumbol to obtain payment from HSBC.

389. I have considered whether Tetronics nonetheless breached its duty of good faith and fair dealing by *attempting* to condition the delivery of the HSBC Bond on BlueOak Board approval of the terms that Rumbol and Garas had discussed and negotiated at length. I find that there was no such breach. Assuming, without deciding, that under the circumstances it would have been a breach of Tetronics' "reasonable efforts" obligation or a breach of its duty of good faith to with-hold delivery of the HSBC Bond until BlueOak's Board committed to the arrangement, I have not been directed to any legal authority for the proposition that the mere intention to breach an express or implied contractual obligation gives rise to a breach.

(m) Conclusions Re: Insisting on an Additional Payment of £916,000

390. For the reasons I have stated, I find that BlueOak has failed to establish that Tetronics breached the implied covenant of good faith and fair dealing as alleged.

(F) Tetronics' Alleged Breach of Implied Warranty of Fitness

391. For reasons described above, I find that it is not an express requirement of the Contract that the Second System consistently heat metal alloy to temperature of 1600°C. BlueOak alleges, in the alternative, that Tetronics breached a warranty implied under New York law that goods and services supplied are fit for BlueOak's particular purpose. [RPHB1 ¶¶227-233; RPHB2 ¶¶103-108]

(a) New York Law Concerning the Implied Warranty of Fitness

392. N.Y. U.C.C. §2-315 [CLX-123/RLX-003] provides:

> Where the seller at the time of contracting has reason to know any particular purpose[ ] for which the goods are required and that the buyer is relying on the seller's skill or judgment to select or furnish suitable goods, there is unless excluded or modified under the next section an implied warranty that the goods shall be fit for such purpose.

There is no suggestion by either party that, N.Y. U.C.C. § 2-315 is not part of the applicable law in this arbitration.

393. Under New York law, "to prevail on a claim of breach of implied warranty of fitness for a particular purpose, a plaintiff 'must establish that the seller had reason to know, at the time of contracting, the buyer's particular purpose for which the goods are required and that the buyer was justifiably relying upon the seller's skill and judgment to select and furnish suitable goods, and that the buyer did in fact rely on that skill.'" [CLX-8, *B&M Linen Corp. v. Kannegiesser USA Corp.*,No. 08 CIV. 10093 LAP,2013 WL 1142679, at *7 (S.D.N.Y. Mar. 19,2013) (CLX-8) (citing *Saratoga Spa & Bath, Inc.v. Beeche Sys. Corp.,*230 A.D. 2d326,331 (N.Y.App. Div. 1997) (CLX-21); See also, RLX-012, *Simmons v. Washing Equipment Technologies*, 51 A.D.3d 1390, 1391 (N.Y. Sup. Ct. 2008)]

394. Stated another way, the buyer has the burden of proving the following six elements to establish an implied warranty of fitness for purpose: (1) that buyer purchased the machine for a particular purpose; (2) that seller knew or had reason to know that buyer wanted the machine for a particular purpose; (3) that buyer justifiably relied on seller's skill or judgment in buying the machine; (4) that seller knew the buyer

was relying on seller; (5) that the machine was not fit for the particular purpose; and (6) that buyer notified seller within a reasonable time after buyer discovered or should have discovered that the machine was not fit for the particular purpose. [CLX-18, *N.Y. Pattern Jury Instr. Civil 4:40*]

395. Without justifiable reliance, there is no implied warranty of fitness. *See* [CLX-71, *Abbott Labs. v. Adelphia Supply USA,* No. 15CV5826CBALB, 2017 WL 6014322, at *6–7 (E.D.N.Y. Aug. 14, 2017)]

396. UCC §2-316(2) provides that, "to exclude or modify any implied warranty of fitness the exclusion must be by a writing and conspicuous." [CLX-125] That section further provides that, "Language to exclude all implied warranties of fitness is sufficient if it states, for example, that "There are no warranties which extend beyond the description on the face hereof." A disclaimer of implied warranties of fitness may be excluded "by general language" as long as it is "in writing" and "conspicuous." [CLX-53UCC § 2-316, cmt. 4] The UCC defines "conspicuous" as that a "reasonable person against which it is to operate ought to have noticed it." [CLX-126, UCC § 1-201(10)]

397. A disclaimer is "conspicuous" where sophisticated parties have drafted the contract containing the disclaimers and the party against whom the disclaimers would be enforced should have noticed them. [CLX-72, *American Elec. Power Co. v. Westinghouse Elec. Corp.,* 418 F. Supp. 435, 451 n.22 (S.D.N.Y. 1976)]

(b) The Parties' Contentions

398. In summary, BlueOak contends:

    a. Tetronics was aware when Variation 02 was made that:
        i. Blueoak intended to granulate the metal alloy; [RPHB1 ¶¶229,230]
        ii. granulation was of central importance to BlueOak's business plan; [RPHB1 ¶231]

    b. Tetronics breached the implied warranty by "failing to provide a furnace capable of heating the metal alloy to a granulatable tapping temperature;" of 1600°C." [RPHB1 ¶227]

399. In summary, Tetronics contends:

a. The implied warranty claim is excluded because Tetronics and BlueOak expressly disclaimed all implied warranties, by Clause 18.2(b)(i) of the Conditions to the Contract; [CPHB1 ¶¶163-165]

b. Tetronics did not know or have reason to know that the output from its furnace would have to be at 1600°C for BlueOak's downstream processes; [CM1 ¶¶110-114; CPHB1 ¶¶166-173]

c. BlueOak did not actually rely on Tetronics' skill or judgment to process engineer the interface between the furnace and the downstream granulator, but rather reserved that responsibility to itself; [CM1¶¶ 110,116; CM3 ¶¶161-165; CPHB1 ¶¶174-176]

d. BlueOak admits that the Contract "specifies that BlueOak is responsible for downstream processing of the molten alloy, rather than Tetronics;" [CM3 ¶160, citing RM1 ¶30; CPHB1 ¶160]

e. Alternatively, Tetronics was not aware that BlueOak was relying on Tetronics to process engineer BlueOak's entire industrial process because BlueOak never asked Tetronics to perform such process engineering; [CM1 ¶¶110, 116; CPHB1 ¶¶168-176] and

f. The implied warranty is inconsistent with the express terms of the Contract which, language carried forward from the FEED & Supply Contract into the final Contract, indicates that the output alloy will be cast into ingots, rather than granulated. [CM1 ¶¶110, 113; CPHB1 ¶166]

(c) Analysis

400. I do not accept Tetronics' contention that Clause 18.2 of the Conditions to the Contract excludes any implied warranty of fitness. The subsection emphasized by Tetronics (18.2(1)) states that each party agrees that "it does not rely, and has not relied, upon <u>any representation</u> (whether negligent or innocent), <u>statement, warranty or other term made or agreed to by any person</u> (whether a Party to this Contract or not) <u>except those contained in this Contract and the Licence Agreement</u>" (emphasis added). The plain meaning of the clause is that each party

disclaims reliance on warranties "made or agreed to by any person." It does not address or exclude warranties implied by law.

401. I agree with Tetronics, however, that the evidence falls far short of establishing that when the Contract was made Tetronics knew that an alloy temperature of 1600°C was required in order for the metal alloy to be granulatable. There is no contemporaneous written record of this allegedly essential fact being communicated to Tetronics until after Variation 02 was executed, after BlueOak had signed-off on the design presented at the CDR and after commissioning efforts were underway. As described earlier in this award, there is no express warranty or covenant in the Contract requiring a 1600°C alloy temperature.

402. The only evidence that the need for 1600°C alloy was even discussed before the Contract was finalized is that of Garas. Garas' oral evidence during re-examination at the evidentiary hearing is that the need for a 1600°C alloy was "discussed at length" with Rumbol during the negotiation of Variation 02. He says that he told Rumbol that the Second System had to "be able to feed 1600-degree into the granulator." [TR Day 6 (Garas) pp. 97, 98] I do not find this evidence credible. There was no mention of any such discussions in any of Garas' three witness statements, even when, in his first two statements, he squarely addressed the question of whether Tetronics knew of the 1600°C alloy temperature requirement. [RWS001 (Garas) ¶¶11-15; RWS002 (Garas) ¶¶14-18] For example, in his First Witness Statement, Garas says: [RWS001 (Garas) ¶11]

> 11. In my opinion, there was never a question that the metal alloy in the furnace would only be tapped when the metal alloy reached 1600ºC, in order to prevent freezing of the alloy and to properly process the e-waste into a precious metal bearing alloy.
>
> …
>
> 13. In my opinion, it was equally clear to all that attempting to process "cold alloy" in the granulator could have catastrophic, likely fatal, consequences.

403. It is clear that in his witness statements Garas is expressing an "opinion" that Tetronics must have known of the 1600°C alloy temperature requirement. This would have been unnecessary if Garas knew that he had specifically discussed the matter "at length" with Rumbol. If the discussions Garas mentioned in his oral evidence actually occurred I would have expected them to have been described in

his witness statements. For these reasons, I do not accept Garas' oral evidence that the matter was expressly discussed by him with Rumbol during the Contract negotiations.

404. BlueOak also relies on the fact that, before Variation 02 was agreed, Tetronics had received the draft Granulation SOP prepared by BlueOak. As described above, the Granulation SOP prepared by BlueOak, which places a heavy emphasis on safety, includes a description of "Important Control Parameters" which included a "normal" alloy temperature of 1398°C, "minimum" temperature of 1301°C and "maximum" temperature of 1593°C. [CX-008]. I find that the receipt of these documents did not alert and was not reasonably sufficient to alert Tetronics to a requirement that alloy must be heated to a temperature of 1600°C for the purposes of granulation.

(d) Conclusion

405. For the reasons I have stated, I find that the BlueOak has failed to prove that when the Contract was made Tetronics knew that BlueOak required 1600°C alloy for the purposes of granulation. For this reason, BlueOak's claim based on an implied warranty of fitness for purpose fails. As a result of this finding, it is not necessary for me to address Tetronics' alternative arguments.

(G) Tetronics' Alleged Breach of Contract: Failure to Comply with Insurance Requirements in Clauses 14.1, 14.4, 14.5 and 14.9

406. The relevant parts of Contract are re-stated here for convenience:

> **14. Insurance and Indemnification**
>
> 14.1 The Seller shall at its own expense procure and maintain … a professional indemnity insurance policy … until the end of the Warranty Period indemnifying the Buyer for any claim which it may become legally liable to pay because of claims arising out of the performance of the professional engineering in connection with this Contract. Each claim and aggregate limit shall not be less than the Contract Price ….
> …
>
> 14.4 The Seller will provide to the Buyer insurance certificates documenting coverage for professional indemnity insurance as specified in Clause 14.1 and commercial general liability insurance including products liability insurance as specified in Clause 14.5 …. Certificates shall be provided

no later than thirty (30) days after the effective date of the insurance policy, except in the case of the defects coverage which shall be provided no later than thirty (30) days prior to transfer of risk to the Buyer

.

14.5 Seller shall maintain, and provide evidence of, product liability insurance being part of the commercial general liability and commercial umbrella in the amount of at least $10 million USD. Such limit shall be provided under the commercial general liability and commercial umbrella. This limit is not considered to be a limitation of any liability assessed.

…

14.9 If … any substantial change is made which affects the interests of the Buyer, and/or the Seller, such cancellation or change shall not be effective as to the affected Party respectively for thirty (30) days after receipt by such Party of written notice sent by registered mail.

(a) The Parties' Contentions

407. In summary, BlueOak contends that Tetronics breached the Contract by:

a. Failing to obtain a policy of professional indemnity insurance that could indemnify BlueOak, as distinct from Tetronics, as required by Clause 14.1; and [RPHB1 ¶¶212-214, 217-219; RPHB2 ¶¶64-70]

b. Failing to maintain product liability insurance as required by Clause 14.5;

c. Failing to provide insurance certificates during the term of the Contract as required by Clause 14.4. [RPHB2 ¶¶70,71]

d. Failing to notify BlueOak of substantial changes to its insurance policies as required by Clause 14.9. [RPHB1 ¶¶213, 215, 216; RPHB2 ¶72]

408. In summary, Tetronics contends:

a. Tetronics had in place a professional indemnity policy, which would indemnify BlueOak, as required by Clause 14.1; [CPHB1 ¶¶192-195]

b. Under Clause 14.1 the required professional indemnity insurance need only indemnify BlueOak against third party claims against BlueOak, of which there are none in this case; [CPHB1 ¶196] and

c. Tetronics procured and maintained product liability insurance as required by Clause 14.5; [CPHB1 ¶197]

d. Insurance "certificates," as such, are not provided by its English-based insurer, but the documents provided (the policy schedules and endorsements [RX-058, RX-059]) serve the same purpose and satisfy its obligation under Clause 14.4. [CPHB1 ¶199] and

e. Tetronics has failed to prove a breach of Clause 14.9 as the evidence does not show that there was any substantial change to Tetronics' insurance policies of which BlueOak did not have notice. [CPHB1 ¶200]

(b) Analysis

409. The parties agree that the professional indemnity insurance required to be procured and maintained under Clause 14.1 is to indemnify BlueOak for any claim it must pay to a third party as a result of Tetronics' performance of engineering services in connection with the Contract. [CPHB1 ¶196; RPHB2 ¶68] BlueOak is not a named insured under the professional indemnity policy Tetronics procured. That policy indemnifies Tetronics against claims that are made against Tetronics as a result of providing engineering services. [RX-058] As a result, BlueOak cannot make an indemnity claim directly against the insurer, if a third party makes a claim against BlueOak.

410. Tetronics submits that there are no relevant third-party claims against BlueOak. [CPHB1 ¶196] While that is a factor to be taken into account if one is determining the materiality of any breach or assessing any damages, it is not an answer to the question of whether there was a breach because the required insurance was not in place.

411. Tetronics relies on the evidence of William Solly, an experienced insurance broker who assisted Tetronics in procuring insurance. His evidence is that it is not possible for Tetronics to obtain a "professional indemnity" insurance policy naming a potential claimant against Tetronics (in this case BlueOak) as an additional insured. Solly's evidence is that the nature of a professional indemnity policy is that it provides insurance to the professional to indemnify the professional against third-party claims. He says that if BlueOak wished to obtain insurance directly

indemnifying it against losses caused by defective engineering services, some other form of insurance (e.g. a "latent defects" policy) would have to be arranged. [TR Day 2 (Solly) pp. 97-100] Solly's evidence is that the professional indemnity policy Tetronics procured indirectly indemnified BlueOak because BlueOak could make a claim against Tetronics and the policy would provide funds to Tetronics toward satisfying the claim. [TR Day 2 (Solly) p.100]

412. I accept Solly's evidence that as matter of fact Tetronics could not have obtained a "professional indemnity" policy giving BlueOak the direct right to claim against the insurer. The business purpose of Clause 14.1 was to ensure that funds were available to Tetronics to satisfy claims by BlueOak arising from BlueOak's liability to third parties. It would defeat that purpose, and would be commercially absurd, to interpret the Contract as requiring Tetronics to obtain a form of insurance that is not available. In the light of these circumstances, I find that the phrase "professional indemnity insurance policy … indemnifying the Buyer" was intended by the parties to refer to precisely the kind of insurance that Tetronics obtained.

413. The Contract requires that under the requisite professional indemnity policy "[e]ach claim and aggregate limit shall not be less than the Contract Price." The "Contract Price" is defined as equaling £7,576,250. The evidence shows that Tetronics' policy limit was £8,000,000. [RX-058; TR Day 2 (Solly) p. 92] BlueOak contends, however, that the policy has been eroded by payments made to Tetronics by the insurer to indemnify Tetronics for legal expenses incurred in defending BlueOak's allegations of professional negligence and faulty design. [RPHB1 ¶216] In my view this fact is not relevant. The "limit" under the professional indemnity policy is more than the Contract Price, as agreed.

414. For the reasons I have stated, I find that Tetronics did not breach Clause 14.1 as alleged.

415. The evidence shows that, contrary to BlueOak's assertions, Tetronics did obtain product liability insurance as required by Clause 14.5. That insurance was part of Tetronics' commercial general liability policy. [RX-059; CWS189 (Solly) ¶7] I find that Tetronics did not breach Clause 14.5 as alleged.

416. While Clause 14.4 requires Tetronics to deliver "insurance certificates documenting coverage" within 30 days of the issuance of the policies, the evidence shows that as matter of practice Tetronics' insurers did not issue formal "certificates" of

insurance. They do, however, issue policies that, in addition to their standard policy language, include schedules and endorsements confirming that coverage is in place, the duration of coverage, policy limits and other important information. I find that such documents fall within the meaning of the phrase "insurance certificates documenting coverage" as used in Clause 14.4. The delivery of such documents clearly satisfies the business purpose of Clause 14.4 which is to assure BlueOak that the insurance coverage for which it bargained is in place. [RX-058; RX-059]

417. The evidence shows, however, that before BlueOak's purported termination of the Contract, Tetronics did not deliver insurance certificates or equivalent information, to BlueOak as required by Clause 14.4. After the purported termination, BlueOak repeatedly asked for evidence of insurance. Insurance documents were only produced January 2019, after Tetronics was compelled to produce them by order of the Sole Arbitrator. [RWS002 (Garas) ¶35]

418. I find that Tetronics breached Clause 14.4 of the Contract by failing to deliver the schedules and endorsements issued by its professional indemnity and commercial general liability policies within 30 days of policy issuance.

419. BlueOak's claim under Clause 14.9 is that Tetronics failed to notify BlueOak of substantial changes to its insurance policies. The only "substantial changes" which it identifies, however, are (i) the fact that Tetronics has made a claim on its professional indemnity policy as a result of BlueOak's claims against Tetronics, and (ii) the fact that the amount of insurance proceeds available has been reduced by the insurer's payment of Tetronics' defence costs. [RM3 ¶¶81-83; RPHB1 ¶¶213, 215, 216]

420. Tetronics contends that the business purpose of Clause 14.9 was to ensure that BlueOak was aware of events that might result in substantial changes to the insurance coverage and that, as BlueOak knew that it had made its claim, there was no need for notification. That submission, however, ignores the fact that BlueOak did not know whether a claim had been made and did not have in its possession the professional indemnity policy or even the evidence of coverage to which it was entitled under Clause 14.4.

421. I find that Tetronics' failure to notify BlueOak of having made a claim to its insurer was a breach of Clause 14.9. I find, however, that that breach, alone or in conjunction with the breach of Clause 14.4, is not material, as the key obligation –

procuring the required insurance – was satisfied. The failure to provide the requisite proof of insurance and the lack of notice have not been shown to have caused any actual loss or damage.

(c) Conclusions

422. In summary, I find that:

a. Tetronics did not breach Clauses 14.1 and 14.5;

b. Tetronics breached Clause 14.4 but the breach was not a material breach;

c. Tetronics breached Clause 14.9, but that breach, alone or in combination with the breach of Clause 14.4, was not material; and

d. As the breaches of Clauses 14.4 and 14.9 have not been shown to have caused any loss, any claim for damages in respect of those breaches is rejected.

(H) Tetronics' Alleged Breach of Contract: Failure to Maintain Sufficient Security as Required by Clause 10A

423. In its 11 December 2017 Default Notice, supplemented by a follow-up letter, BlueOak alleged that Tetronics was in breach of Clause 10A of the Contract by failing to have in place a bond that extended beyond 19 January 2018. [RX-004; CX-048] In its First Post-Hearing Brief, in a footnote, BlueOak states: "BlueOak is no longer pursuing a claim for failure to maintain an appropriate security under Clause 10A of VA02." [RPHB1 FN366] It is not clear whether this is an abandonment of not only any claim for damages but also any argument that Tetronics was in material breach under Clause 10A so as to justify termination of the Contract.

424. I find that, by virtue of the HSBC Bond, the security required by Clause 10A was in place when the Default Notice was given. Clause 10A requires Tetronics to "use reasonable efforts to extend the duration of the Advance Payment Bond in the reduced amount of £3,080,000 to successful completion of FAT." I do not interpret Clause 10A as requiring that at all times there must be a bond in place having an expiry date after the expected date for achieving FAT. Bonds expire and must be renewed or replaced. The parties knew when the Contract was made that there would not be a single bond in place that covered the life of the project. This is

evident from the language of Clause 10A requiring Tetronics to use reasonable efforts to extend the duration of the then current bond and describing what was to be done if that were not achieved. There is no evidence that Tetronics repudiated its obligation to use reasonable efforts. As of the date of the Default Notice Tetronics was not in material default under Clause 10A.

425. The issue became moot when BlueOak called the HSBC Bond and received payment of the full amount. BlueOak does not suggest that Tetronics had to obtain another bond even though BlueOak had already received £3,080,000.

426. For the reasons I have stated, I find that Tetronics was not in material breach of Clause 10A when BlueOak delivered the Default Notice and Termination Notice.

(I) Tetronics' Alternative Argument that BlueOak's Conduct Excuses Tetronics' Breaches Under New York Law

427. There is a substantial body of evidence and written argument concerning the question of whether the conduct of BlueOak delayed or interfered with Tetronics' progress toward completing its own obligations under the Contract. [See, e.g. CPHB1 ¶¶27-39, 289-320] Tetronics relies on this evidence both as an alternative defence to BlueOak's claims of breach of contract and as the basis for certain of its own claims for breach of contract.

428. To the extent that BlueOak's alleged conduct is relied on as an alternative defence, it need not be considered at this stage of the analysis because, with two exceptions, I have determined for other reasons that BlueOak has failed to establish its claims of breach of contract. The two exceptions are Tetronics' breaches of Clauses 14.4 and 14.9. The alternative defence raised by Tetronics is no answer to these claims, however, because Tetronics does not allege that BlueOak's conduct in any way delayed or impaired Tetronics' ability to perform its obligations under those two provisions.

429. To the extent that BlueOak's conduct is relied on by Tetronics as the basis for a claim of breach by BlueOak, the evidence and arguments are discussed below.

(J) BlueOak's Alleged Breach of Contract: Wrongful Termination Under Cause 17.2

430. The relevant termination provisions of the Contract are re-stated here for convenience:

17.2 If the Seller:

…

(b) Is otherwise in breach of any of its material obligations under this Contract;

then the Seller shall, within thirty (30) days of receipt from the Buyer of notice of default under this Clause 17.2, correct or cause to be corrected such default or make or cause to be made provision satisfactory to the Buyer for correcting such default within a reasonable time thereafter, failing which the Buyer may at its option terminate this Contract.

…

17.5 If the Buyer is in breach of its material obligations under this Contract and has not cured this breach within thirty (30) days upon written notice by Seller, then Seller may, at its option, terminate this Contract.

431. BlueOak relies on its 11 December 2017 Default Notice as providing the 30 days notice of material breaches of the Contract required under Clauses 17.2(b) and 17.5. On that basis, BlueOak contends that it was entitled to terminate the Contract on 12 February 2018. [RX-004]

432. As described in detail above, the Default Notice states that Tetronics had "materially breached" the Contract and notifies Tetronics of its failure to conform to the warranties under the Contract. It specifically alleges non-conformities with Clauses 9.1(a), 9.1(b) and 2.2. It observed that because the HSBC Bond was to expire on 19 January 2018 it was "inadequate under Section I0A of the Agreement." In its letter of 26 December 2017 BlueOak stated that the failure to place security extending beyond the current expiry date was a material breach. [CX-048] No other material breaches of the Contract were specified in the Default Notice. There was no mention of a breach of any of Clauses 14.1, 14.4, 14.5, or 14.9. There was no allegation of a breach of an implied covenant of good faith and fair dealing or an implied warranty of fitness.

433. For the reasons stated above, my finding is that Tetronics was not, as of the date of the Default Notice or as of the date of the Termination Notice in material breach of any of Clauses 2.2, 2.3, 9.1(a), 9.1(b), 10A, 14.1 and 14.5, of the Contract, the implied covenant of good faith and fair dealing or an implied warranty of fitness. For reasons stated above, I also find that Tetronics was in breach of Clauses 14.4

and 14.9, but that those breaches, alone or together, were not material breaches of the Contract.

434. I find that BlueOak's purported termination based on Clause 17.2 was not justified because, when both the Default Notice and the Termination Notice were delivered Tetronics was not in material breach of any obligations under the Contract, including those specified in the Default Notice. I agree with Tetronics' submission that "by improperly and prematurely terminating the Contract, BlueOak anticipatorily repudiated the Contract." [CPHB1 ¶143]

435. Tetronics makes what I understand to be alternative submissions designed to overcome the requirement in Clause 17.2 that after receipt of a default notice Tetronics was to have 30 days to make provision "satisfactory to the Buyer for correcting such default within a reasonable time thereafter." Tetronics submits that BlueOak acquiesced in its remedial plans or failed to act reasonably and in good faith in exercising its discretion to reject the plan contrary to the covenant of good faith and fair dealing as a result of which the termination was a breach of implied covenant. [CPHB1 ¶¶226-228]

436. The obligation of Tetronics under Clause 17.2 to make "provision" for correction and the requirement for BlueOak to be satisfied with that provision, however, arises only if there has been a material breach and a valid notice of default. As I find that there was no material breach and no valid notice of default the obligation of Tetronics under Clause 17.2 does not arise. In the circumstances, it is sufficient to state that If I had found that there were material breaches as alleged in the Default Notice, then I agree with Tetronics that after accepting the benefit of Tetronics' continued performance of work in accordance with its remedial plan, and after purporting to enforce the Contract by drawing on the HSBC Bond, it would have been a breach of the covenant of good faith and fair dealing for BlueOak to then peremptorily terminate the Contract as it purported to do. [See, for example, CLX-80, *1-10 Indus. Assocs., LLC v. Trim Corp. of Am.*, 747 N.Y.S.2d 29, 31 (N.Y. App. Div. 2002); CLX-81, *Dalton v. Educ. Testing Serv.*, 87 N.Y.S.2d 384, 390 (N.Y. App. Div. 1995) (where the contract "contemplates" the use of discretion, the implied covenant of good faith and fair dealing includes a promise not to act arbitrarily or irrationally in exercising that discretion." (internal quotations omitted)]

437. For the reasons I have stated, I find that BlueOak breached and repudiated the Contract by its wrongful termination.

(K) BlueOak's Alleged Breach of Contract: Drawing on the HSBC Bond in Breach of Clause 17.3

438. The Contract states (emphasis added):

> 17.3 Upon any termination pursuant to Clause 17.1 or 17.2 the Buyer may, as a remedy
>
> (a) Subject only to making payment to the Seller of any amount equal to the aggregate cost of all Equipment on Site, together with the value of engineering and design, as reasonably determined by the Buyer and the Seller less the aggregate of all amounts previously paid by the Buyer to the Seller in accordance with Schedule 1, take possession of all Equipment located at the Seller's facilities or the facilities of any supplier or any other supplier or subcontractor, whether or not such Equipment is in a deliverable state; or
>
> (c) Draw the full amount of the incurred damages from any outstanding Advance Payment Bond, to the extent that the Buyer has incurred damages due to such termination and such damages are not covered under other rights exercised by the Buyer. In the event that the Buyer intends to draw on any Advance Payment Bond due to a termination the Seller shall have the opportunity, but in no case longer than thirty (30) days, to provide evidence to the Buyer of its ability to continue to perform its obligations under this Contract. If the Buyer determines in its reasonable discretion that the Seller is able to perform its obligations under this Contract in the manner initially anticipated by the Buyer the Buyer agrees to abstain from making the draw until and unless the Seller fails to perform its obligations under this Contract.

(a) The Parties' Contentions

439. Tetronics contends, *inter alia*, that BlueOak breached the Contract when it called the HSBC Bond because:

a. Tetronics was not in material breach of its obligations under the Contract; [CM3 ¶¶133, 136]

b. BlueOak called the HSBC Bond more than one month before purporting to terminate, rather than "upon termination" as required by Clause 17.2; [CM3 ¶135; CPHB1 ¶234] and

c. BlueOak called the full amount of the HSBC Bond rather than limiting its call "to the extent that [BlueOak had] incurred damages due to such termination;" [CM3 ¶135; CPHB1 ¶233]

440. BlueOak contends that it did not breach the Contract by calling the HSBC Bond because: [RPHB1 ¶¶313-318]

a. "Tetronics' claim that BlueOak breached VA02 by improperly calling the bond should be deemed waived because Tetronics entirely failed to cross-examine BlueOak's witnesses on this issue or in any way rebut their testimony that supports the conclusion that the bond was properly called"; [RPHB1 ¶313]

b. The language of Clause 17.3 is permissive and not exhaustive of the circumstances in which the Advance Payment Bond could be drawn upon, so that the HSBC Bond could be called in other cases, "such as in the event of a material breach (as is the case here)"; [RPHB1 ¶314]

c. The circumstances in which the HSBC Bond could be called were set out in the HSBC Bond itself, which stated that BlueOak could make a draw once it made a written certification to HSBC "that [Tetronics] is in breach of its obligations under the contract, and the respect in which [Tetronics] is in breach." [R2M ¶105; RPHB1 ¶¶317, 318]; and

d. Tetronics' contention that BlueOak improperly drew on the HSBC Bond because the Contract was not yet terminated "has already been litigated and decided in an emergency arbitration proceeding." [RSM2 ¶104]

(b) Analysis

441. I reject BlueOak's contention that by not cross-examining on the issue Tetronics "waived" its right to assert that the call on the HSBC Bond was improper. There is no basis for such a finding in the applicable law or in international arbitration practice. Apart from the question of whether Tetronics was actually in breach of its obligations at the time (concerning which there was great deal of cross-examination) the facts relevant to this issue are not in substantial dispute. The issue is primarily one of contractual interpretation.

442. Clause 17.3(c) is the only provision in the Contract addressing the question of when BlueOak is permitted to draw on the Advance Payment Bond. BlueOak does not dispute that Clause 17.3(c) applies only "upon any termination" pursuant to Clause 17.1 (insolvency) or 17.2 (e.g. for material breach). It submits, however, that by using the phrase "may as a remedy" the parties intended that Clause 17.3 sets out only one set of circumstances (termination) in which the bond may be called. BlueOak submits that this interpretation is confirmed by the use of the phrase "[i]n the event that the Buyer intends to draw on any Advance Payment Bond due to a termination …", which it submits would be redundant if draws could *only* be made upon termination.

443. I do not agree with BlueOak that the language of Clause 17.3 shows that it was not intended to be exhaustive of the circumstances in which a draw on the Bond could be made. Clauses 17.3(a) and (c) provide two alternative remedies in the event of termination (there is no sub-clause (b)). The phrase "may as a remedy" is permissive, but it signals that BlueOak may choose to exercise either of the two specified remedies. The phrase in Clause (c) ("*In the event that the Buyer intends to draw on any Advance Payment Bond due to a termination…")* distinguishes between the two alternative remedies. It means that if BlueOak forms the intention to exercise the remedy set out in Clause (c) (drawing on the Bond) rather than the remedy in Clause (a), Tetronics is to have the opportunity to provide evidence of its ability to perform before the draw occurs. I find that the phrase "may as a remedy" is not intended to reflect an unidentified range of additional remedial options as BlueOak suggests.

444. I find that this interpretation is consistent with the business purpose of the requirement for the Advance Payment Bond and with the Contract as a whole. The business purpose of the "Advance Payment Bond" is to protect BlueOak in certain circumstances where it has made advance payments to Tetronics in excess of what Tetronics has earned. The amount that BlueOak already has advanced to Tetronics factors into both alternative remedies of BlueOak. In the first case, if the value of the Plant and equipment BlueOak retains at termination is more than the amount BlueOak has already advanced, BlueOak must make an additional payment. In the second case, if BlueOak has incurred damages because it has advanced more than the value of the Plant and equipment it will retain, it can recoup its overpayment by claiming the loss on the "Advance Payment Bond." The intent is that, if there is termination, the amount paid to Tetronics is to be brought into balance with the

value of the plant and Equipment BlueOak retains. The Advance Payment Bond is a mechanism to ensure that funds are available to achieve that objective.

445. For the reasons I have stated, I find that the plain meaning of the Contract is that Clause 17.3(b) was intended to be exhaustive of the circumstances in which a draw could be made on the HSBC Bond. This interpretation is consistent with the Contract's other provisions. Clause 12.1(a) of the Contract states that "THE PARTIES ACKNOWLEDGE THAT THE REMEDIES PROVIDED IN THIS CONTRACT ARE EXCLUSIVE AND IN LIEU OF ALL OTHER REMEDIES AVAILABLE TO BUYER AT LAW, IN CONTRACT, IN TORT, IN STATUTE OR IN EQUITY OR IN ANY OTHER THEORY OF LAWS." If BlueOak was to be contractually entitled (as between Tetronics and BlueOak) to draw on the Advance Payment Bond in circumstances other than those set out in Clause 17.3, then the Contract could have, and should have, so stated.

446. I do not agree with BlueOak's submission that, as between Tetronics and BlueOak, the circumstances in which BlueOak could draw on the HSBC Bond are to be determined by the language of the HSBC Bond. The HSBC Bond and the Contract are separate legal instruments. HSBC is not a party to the Contract. The HSBC Bond created rights and obligations as between HSBC as issuer and BlueOak as beneficiary. The basis of HSBC's liability to BlueOak under the HSBC Bond and the basis of Tetronics' liability to BlueOak under the Contract are not the same.

447. For similar reasons, I do not agree with BlueOak's submission that the Emergency Arbitrator finally determined that BlueOak did not breach the Contract by drawing on the HSBC Bond. The Emergency Arbitrator expressly acknowledged that he was not deciding whether BlueOak was in breach of the Contract. He said: [RX-046 ¶100]

> …[Tetronics] may well be right that [BlueOak] was in breach of the underlying Contract when it made its calls on the Bond, but this does not in any way mean that money is not payable by HSBC under the Bond, or that such payment should be blocked by way of injunction.

(c) Conclusion

448. For the reasons I have stated, I find that under the Contract the parties agreed that the only circumstance in which BlueOak was entitled to draw on the HSBC Bond was upon termination of the Contract pursuant to either Clause 17.1 or 17.2. Those circumstances did not exist when BlueOak drew on the HSBC Bond. I find that BlueOak materially breached the Contract by drawing on the HSBC Bond weeks

before its purported termination of the Contract, and in circumstances where Tetronics was not in material breach of any obligation under the Contract.

(L) BlueOak's Alleged Breaches of Contract: Preventing Tetronics From Achieving Contract Milestones

(a) The Parties' Contentions

449. Tetronics contends that BlueOak breached the Contract in three ways which had the effect of preventing Tetronics from achieving contractual milestones and receiving payments under the Contract. The alleged breaches are as follows:

    a. Refusing to allow metal alloy to be tapped during commissioning attempts unless the alloy temperature was 1600°C or, later 1550°C, in breach of Clauses 4, 4.1, and 5.1 of the Conditions to the Contract; [CM1 ¶¶63, 66, 67; CM2 ¶¶50-55; CPHB1 ¶¶291-300]

    b. Providing feedstock that did not meet the Contract requirements, in breach of Clause 5.2 of the Conditions to the Contract; [CM1 ¶¶63, 64, 67; CM2 ¶¶56, 57; CM3 ¶131; CPHB1 ¶¶301-309]; and

    c. Failing to properly maintain and operate the furnace, in breach of Clauses 5.2 and 8.2 of the Contract; [CM1 ¶¶63, 65, 67; CM2 ¶¶48, 64-73; CM3 ¶132; CPHB1 ¶¶310-319]

450. BlueOak submits that Tetronics' affirmative claims of breach of Clauses 4, 4.1 and 5.1 are made for the first time in Tetronics' First Post Hearing Brief. BlueOak submits that in its prior pleadings and submissions Tetronics raised the conduct it now relies on solely as support for its alternative defence that its breaches were excused by BlueOak's conduct. BlueOak submits that it would violate BlueOak's due process rights to allow Tetronics to convert its defence into an affirmative claim through its post-hearing briefing. [RPHB2 ¶¶110-112]

451. Alternatively, BlueOak submits that these breach of contract claims are without merit. RPHB2 ¶113]

(b) Has Tetronics Timely Alleged These Breaches of Contract?

452. I do not agree with BlueOak that the claims are newly and belatedly raised. In its First Memorial, under the heading "Tetronics Breach of Contract Claims Against BlueOak" Tetronics made clear that it relied on these alleged breaches as the basis for both a defence and claim for damages. Tetronics said: [CM1 ¶¶63-67]

> 64. BlueOak refused or was unable to provide input feed material that complied with the Contract's specifications, which caused a cascade of performance problems in the Furnace.
>
> 65. BlueOak poorly maintained and operated the Furnace, which likewise caused the Furnace not to perform as designed.
>
> 66. BlueOak also made demands on the Furnace that were outside the operational parameters of the Contract. Specifically, BlueOak refused to allow the Furnace to be tapped when the alloy was molten, instead insisting that the alloy be held in the Furnace until the alloy reached an arbitrary temperature of 1600°C, then 1550°C.
>
> 67. BlueOak's breaches, and the resulting negative impacts on the Furnace, are detailed in Section VIII, above.
>
> 68. Thus, to the extent that Tetronics was unable to meet the deliverables of the Contract, Tetronics' performance is excused, because that failure was due to BlueOak's own acts. [citations omitted]
>
> 69. These breaches of BlueOak resulted in damages to Tetronics.

453. Similar allegations appear in Tetronics' Third Memorial under the heading "BlueOak Materially Breached the Contract." [C3M ¶¶129-132] In its Memorials Tetronics did not, however, specifically identify Clauses 4, 4.1, 5.1, 5.2 and 8.2 as the clauses that BlueOak had breached by the conduct described in its Memorials.

454. I find that Tetronics has not added a new allegation of breach of contract in its Post-Hearing Briefs, but rather has identified the clauses of the Contract that it says were breached, based on evidence and argument earlier presented. The facts and evidence that underpin these claims also are the same as those relevant to the Tetronics' alternative defence. BlueOak has thoroughly addressed this evidence. In its Second Post Hearing Brief BlueOak had the opportunity to answer, and answers Tetronics' contentions concerning the specific clauses that are alleged to have been breached.

455. I find that in the circumstances there is no procedural unfairness arising from Tetronics' particularization of the clauses alleged to have been breached. For these reasons I reject BlueOak's request that these breach of contract claims be dismissed as untimely.

(c) Insisting on 1600°C/1550°C Alloy Temperature: Alleged Breach of Clauses 4.1 and 5.1

456. The evidence shows that while commissioning efforts were ongoing in 2017 BlueOak instructed its staff not to tap the furnace until the alloy temperature of, initially, 1600°C and, later, 1550°C. [CWS71 (Deegan) ¶24; CWS72 (Conway) ¶¶45-46,49-51; CWS187 (Conway), ¶¶8,9,15; CWS70 (Powell) ¶¶33,34,37; CWS135 (Powell) ¶¶8,9,15] The evidence also shows that the Second System produced molten alloy that could have been tapped, albeit generally at temperatures lower than BlueOak demanded. For example, Hatch observed that "Even though the alloy cannot be easily heated to [1600°C] in the furnace itself, the bath is typically fully molten and alloy can be tapped from the furnace." [RX-015] For reasons set out above, I find that the Contract did not require an alloy tapping temperature of either 1600°C or 1550°C.

457. Tetronics states that BlueOak's conduct was a breach of Clauses 4.1 and 5.1, which state (with emphasis added):

> 4.1 Following installation of the Plant at the Site, the Parties shall undertake Commissioning. Seller shall supervise Commissioning and both the Seller and Buyer will provide adequate resources to ensure its timely completion. On completion of Commissioning, the Seller and Buyer shall, without undue delay, undertake Start Up.
>
> 5.1 The Buyer shall provide the Seller with appropriate access to the Site for the purpose of the Seller carrying out its obligations pursuant to this Contract.

458. Tetronics' allegation of breach is that "[b]y refusing to permit the furnace to be tapped in the course of commissioning on a routine and necessary basis, BlueOak breached its obligations to provide adequate resources to ensure timely completion of the commissioning." [CPHB1 ¶298] I do not agree. Such a refusal is not a failure to "provide adequate resources" or "appropriate access" so as to be breach of either Clause 4.1 or Clause 5.1.

459. As Tetronics has not alleged any other contractual obligation to have been breached by BlueOak's conduct in insisting on 1600°C or 1550°C alloy temperature, I find this claim for breach of contract fails.

(d) Providing Non-Compliant Feedstock: Alleged Breach of Clause 5.2

460. Clause 5.2 of the Contract states (in relevant part, emphasis added):

> 5.2 The Buyer shall provide to the Seller the amount of feedstock necessary to perform required Commissioning and testing at required feed rates. The feedstock will have physical characteristics and composition similar to and within the expected range of variability of the feedstock set out in the Proposal ….

461. In summary, Tetronics contends:

a. Section 2.1 of the Proposal provides that "[t]he feed stream composition used as a basis for this proposal is given in Annex A;" [CPHB1 ¶303; RX-002]

b. Annex A to the Proposal, in turn, is a chart that sets forth the required chemical composition of the feed; [CPHB1 ¶303; RX-002]

c. Section 5.3 of the proposal sets out the physical characteristics of the of feedstock - particle size and variance tolerance for the input material; [CPHB1 ¶¶303,304; RX-002] and

d. BlueOak "habitually provided poor, inconsistent, and non-compliant feed that caused operational problems, shutdowns, undue stresses on the off-gas system, and other challenges that thwarted progress in commissioning the furnace.;" [CPHB1 ¶¶306-309]

462. In summary, BlueOak contends:

a. The required "physical characteristics … composition similar [and] the expected range of variability of the feedstock" is set out in Section 5.3 of the Proposal; [RM2 ¶¶60,61,71] and

b. With a small number of exceptions, the feedstock provided by BlueOak complied with these specifications; [RM2 ¶¶62-66] and

463. Section 5.3 of the Proposal states: [RX-002]

5.3 Input Material Specification

The systems performance is dependent on the input material specification. The raw materials will be analysed for particle size, loss on ignition (LOI), and for gold, silver, PGM and copper content by the End User to the given values in the PAT and FAT document (schedules 4 and 5 of the supply contract) Table below:

Metal	**Input Specification**
Gold	> 0.002 wt%
Silver	> 0.01 wt%
PGM (combined total)	> 0.002 wt%
Copper	> 8 wt%
Organics (determined by LOI)	10% to 35 wt%
Particle Top Size	< 50 mm

The material will be crushed before feeding to the plasma system, with a size range of 30-50 mm (+/-10%) as already agreed.

464. These "Input Material Specifications" are also embodied in Annexes 5 and 6 to Variation 02, which set out the feedstock that BlueOak is required to provide for the purposes of conducting PAT and FAT.

465. I agree with BlueOak's contention that when Clause 5.2 of the Contract requires BlueOak to provide feedstock having "physical characteristics and composition similar to and within the expected range of variability of the feedstock set out in the Proposal" it refers to the "Input Material Specification" in Section 5.3 of the Proposal and not to Annex "A". First, Section 5.3 is titled "Input Material Specification." Second, Section 5.3 deals with all three of the specification criteria mention in Clause 5.2 – physical characteristics, composition and range of variability. Annex A to the Proposal lists specific, fixed percentages by weight for each of 25 Ash elements and compounds and 4 non-Ash elements. No ranges are provided. No particle sizes are described. If Annex A applied, it would negate the ranges of variability set out in Section 5.3 and expressly contemplated by Clause 5.2. It would also set a single, inflexible compositional requirement in circumstances when it was known that the composition of feedstock batches would vary. It does not make commercial sense to conclude that the parties agreed to a comprehensive fixed compositional standard that necessarily would seldom be satisfied.

466. I find that Annexes A and B are explanatory attachments to the Proposal, setting out the set of complimentary assumed inputs and outputs on which the Proposal was based, but that the Proposal only contemplated that BlueOak (as "End User") would be contractually required to meet the "Input Material Specification" described in Section 5.3. This interpretation gives effect to the plain meaning of Clause 5.2 of the Contract and makes commercial sense.

467. The evidence shows that BlueOak generally complied with the Input Material Specification as to particle size. BlueOak used a commercial shredder to reduce the e-waste. The shredding process included a 1.25-inch screen that provided a final sizing step in the shredding process. Occasionally, however, the shredding process would allow pieces with that were 1.25 inches wide but longer than perhaps 6 or 7 inches. Tetronics referred to these anomalies as "stringers." These long, irregularly-shaped pieces of circuit board were not common. [RWS13 (Mark Wester Witness Statement) ¶ 1] The evidence shows that BlueOak generally complied with the Input Material Specification as to composition. [RWS5 (Foster) ¶¶31-35] I accept the evidence of Deegan, however, that there were instances where the LOI for feed batches was in excess of the limit allowed under the Input Material Specification (<35% wt.). While the non-compliant feed was accepted by Tetronics, the parties agreed to input the feed in smaller amounts, which protracted the processing time. [CWS71 (Deegan) ¶¶18-20]

468. It is not possible to distil from the evidence a discrete amount of time that was lost due to non-compliant feed, as distinct from other delay-causing events.

469. Despite my finding that BlueOak did not comply fully and consistently with its obligation under Clause 5.2 of the Contact with respect to feed size and composition, for reasons discussed below I do not find that Tetronics has shown that this breach caused the losses that Tetronics claims as damages.

(e) Failing to Properly Maintain and Operate: Alleged Breach of Clauses 5.2 and 8.2

470. Clause 5.2 of Schedule 3 to the Contract further states that "[BlueOak] shall also provide all services, facilities, materials and labour necessary to enable the Seller to undertake all tests and operation procedures…." Clause 8.2 states (emphasis added):

8.2 The Buyer shall, and shall procure that its employees, officers, agents or sub-contractors shall:

(a) not reverse engineer the Equipment or Replacement Equipment or of any of its components;

(b) not modify, alter, add to or remove from, or otherwise tamper with the Equipment or Replacement Equipment or any of its components or the process flow diagrams, operating manual and torch maintenance manual in any material way prior to the expiry of the Warranty Period without the agreement of the Seller….

471. In summary, Tetronics contends that BlueOak failed to adequately maintain the Second System and that while Tetronics was off-site from mid-October 2017 until the beginning of January 2018, BlueOak operated an unapproved oxyfuel burner within the plasma furnace and performed other alterations that Tetronics had not approved. Deegan's evidence is that an analysis of the plant control software logs recorded in the operating control software during Tetronics' absence from the site shows that the Second System was repeatedly operated outside of the agreed design and operation parameters. [CWS71 (Deegan) ¶¶36-38; RPHB1 ¶¶317, 318]

472. BlueOak contends that, although it did make some alterations, they were made in the interests of safety, and did not materially impair the operation of the Second System. BlueOak contends that it was justified in making alterations because Tetronics had demonstrated that it was incapable of commissioning the plant. [RPHB1 ¶¶308-312]

473. I accept the evidence that BlueOak made alterations to the Second System without Tetronics' prior approval and during Tetronics' absence from the site operated the furnace outside agreed operational parameters. Apart from that, the evidence relied on concerning poor system maintenance by BlueOak lacks detail, involves some conjecture and is unconvincing. [See, e.g. CWS71 ¶29] Operating the Second System outside of agreed operating parameters might have had other legal or practical implications, but it was not a breach of Clause 5.2. The Clause plainly deals with a different subject matter – the need for BlueOak to provide necessary resources. I find that BlueOak breached its obligations under Clause 8.2 of the Contract but has not been shown to have breached its obligations under Clause 5.2.

474. Despite my finding that BlueOak did not comply with its agreement under Clause 8.2 not to alter the Second System without Tetronics' agreement, for reasons

discussed below I do not find that Tetronics has shown that this breach caused the losses that Tetronics claims as damages.

(f) BlueOak's Breaches of Clauses 5.2 and 8.2 Did Not Cause Tetronics' Loss of Future Milestone Payments

475. Tetronics claims as damages for these breaches, the milestone payments it would have received if the Contract had continued to completion. In essence Tetronics asserts that, but for these breaches, the milestones would have been achieved and the payments received. There is no contractual claim for increased costs caused by interference or delay.

476. For a number of reasons, I find that the breaches under discussion did not cause the losses or damages that Tetronics claims:

a. Based on Tetronics own evidence and argument, what caused Tetronics to be unable to achieve the Contract milestones that would have triggered the additional payments (SUT 1, SUT 2 and FAT) was BlueOak's wrongful termination of the Contract;

b. As set out earlier in this award, a mere failure to achieve the VA Gantt Chart dates did not deprive Tetronics of its Contractual entitlements or justify termination of the Contract by BlueOak; and

c. The evidence shows that, in addition to the conduct that I have found amounts to breaches of Clauses 5.2 and 8.2, there were other, concurrent factors that caused delay relative to original timing expectations, namely, problems with the off-gas system and the other matters that were the subject of Tetronics corrective measures that were developed by Tetronics in November and December 2017 and implemented by Tetronics in January 2018;

d. The evidence does not establish that the need for these corrective measures was driven by the conduct of BlueOak that I have found amounted to a breach of the Contract.

477. I find that delays in achieving SUT 1, SUT 2 and FAT up to the date the Contract was terminated were caused by a number of concurrent factors only some of which

were the result of BlueOak's breaches. I find that it is not possible to distil from the evidence a period of delay that was caused by BlueOak's breaches alone. I also find that despite the delay impact of BlueOak's breaches in combination with these other factors, as of the date of termination of the Contract Tetronics' contractual right to receive the milestone payments upon achieving the milestones continued. Tetronics had not suffered the damages which it now seeks to recover. I find that the cause of Tetronics loss was not BlueOak's breaches of Clauses 5.2 and 8.2, but rather BlueOak's wrongful termination of the Contract.

(g) Summary of Conclusions

478. In summary, I find:

a. BlueOak's insistence on an alloy tapping temperature that was not required by the Contract was not a breach of Clauses 4.1 or 5.1 as alleged;

b. BlueOak occasionally breached Clause 5.2 by providing non-compliant feed;

c. Tetronics has failed to establish that BlueOak breached Clause 5.2 by failing to properly maintain the Second System;

d. BlueOak breached Clause 8.2 of the Contract by making unauthorized alterations to the Second System;

e. BlueOak's breaches did not, however, cause Tetronics to be unable to receive the milestone payments it claims as damages; and

f. As a result, Tetronics' claims for damages for breach of clauses 4.1, 5.1, 5.2 and 8.2 is rejected.

(M) BlueOak's Alleged Breaches of Contract: Disclosing Confidential Information in Breach of Clauses 8.2 and 13.2

(a) The Relevant Contractual Provisions

479. Clause 8.2 of the Conditions to the Contract states (in relevant part):

8.2 The Buyer shall, and shall procure that its employees, officers, agents or sub-contractors shall:

(a) … ;

(b) … ;

(c) not use or deal with the Seller's intellectual property in any way other than for the Permitted Purpose;

(d) treat the Seller's intellectual property as Confidential Information and thus subject to the terms of Clause 13 (Confidentiality); and

(e) otherwise agree to be bound by terms which are no less restrictive then that set forth in the Licence Agreement.

480. Clause 13 of the Conditions to the Contract states (in relevant part):

13. Confidentiality

13.1 Subject to Clause 13.2 the Parties shall keep confidential all the Confidential Information received by one Party from the other Party relating to this Contract and shall use all reasonable endeavours to prevent their employees, subcontractors, Associated Company, and agents from making any disclosure to any third party of any Confidential Information.

13.2 The obligation in Clause 13.1 shall not apply to:

(b) [sic] any disclosure of information that is reasonably required by any Party in the performance of its obligations under this Contract for the performance of those obligations;

(c) … ;

(d) … ; or

(e) any disclosure of information that is reasonably required to be made by either Party to its insurers and/or professional advisors.

481. Clause 1 of the Conditions to the Contract defines “Confidential Information”, as follows:

> "Confidential Information" means any commercial or technical information, including the Seller's intellectual property, in whatever form which is disclosed by one Party to the other Party and which would be regarded as confidential by a reasonable business person including, without limitation, all business, statistical, financial, marketing and personnel information, customer or supplier details, know-how, designs, trade secrets or software of the disclosing Party or any information that is marked as "Confidential."

482. Clause 1 of the Conditions defines "Permitted Purpose" as meaning the permitted purpose specified in Schedule 2. Schedule 2 specifies the "Permitted Purpose" as "[p]rocessing and refining of wastes and other materials, including, but not limited to, e-scrap and auto catalysts."

(b) The Parties' Contentions

483. Tetronics contends that BlueOak breached Clauses 8.2 and 13.2 of the Contract by disclosing Tetronics' confidential intellectual property to Hatch. [CPHB1 ¶¶328-336] Tetronics contends that Hatch is a competitor of Tetronics, that Tetronics was not advised of BlueOak's disclosures of confidential information to Hatch, and that BlueOak actively concealed the disclosures. [CPHB1 ¶¶337-344]

484. BlueOak contends that it did not breach the Contract by disclosing confidential information to Hatch because:

a. Clause 13.2(e) of the Conditions to the Contract allows disclosures of confidential information that are "reasonably required to be made by either Party to its . . . professional advisors." [RPHB1 ¶¶304,305; RPHB2 ¶114]

b. The documents provided by BlueOak to Hatch did not contain proprietary information; [RPHB1 ¶306] and

c. There is no evidence that Hatch provided such information to third parties. [RPHB1 ¶307]

(c) Analysis

485. I find that BlueOak did share with Hatch information that falls within the definition of "Confidential Information" in the Contract. Hatch was specifically engaged to

review the Second System with a view to making suggestions for improvements. At the evidentiary hearing, Sauter testified that Hatch received from BlueOak all of the process data for the furnace, along with the furnace drawings, schematics and manuals, a furnace operating plan and process flow diagrams. Hatch received any information that Hatch requested from BlueOak, [TR Day 6 (Sauter) pp. 11-13] This information is "commercial or technical information" disclosed by Tetronics to BlueOak which "would be regarded as confidential by a reasonable business person" including "know-how" and "designs." [CX-150,-151,-152,-153; [CXR177 (Gibbon Report) ¶49]

486. By Clause 8.2(c) BlueOak covenants not to use Tetronics' intellectual property other than for a "Permitted Purpose." There is no evidence that BlueOak has used Tetronics' intellectual property other than for processing and refining e-scrap. I find that BlueOak did not breach Clause 8.2(c).

487. Clause 8.2(d) and Clause 13 of the Contract must be read together. The plain meaning of Clause 8.2(d) is that it is Clause 13 (not Clause 8.2) which describes the limitations on the use of "Confidential Information."

488. Clause 13.1 requires BlueOak itself to "keep confidential all the Confidential Information" received from Tetronics. It also acknowledges, however, that BlueOak's "employees, subcontractors, Associated Company, and agents" may also come into possession of such Confidential Information. The obligation on BlueOak when that occurs is to "use all reasonable endeavours" to prevent those persons from making any disclosure to any third party.

489. Clause 13.2(e) expressly permits disclosure of information by BlueOak that is reasonably required to be made by BlueOak to its professional advisors. The consent of Tetronics to any such specific disclosure is not required. The plain meaning of "professional adviser" includes a professional person, such as an engineer or engineering firm, engaged to advise BlueOak. BlueOak engaged Hatch as professional engineers to advise BlueOak in connection with the project. By virtue of sub-Clause 13.2(e), any disclosure of Tetronics' confidential information to hatch was expressly permitted. The evidence shows that BlueOak fulfilled its obligation under Clause 13.1, by requiring Hatch to enter into the Hatch NDA.

(d) Conclusion

490. For the reasons I have stated, I find that BlueOak did not breach Clause 8.2 or Clause 13 of the Contract as alleged by Tetronics.

(N) BlueOak Resources' Liability Under the License Agreement for Disclosure of Confidential Information by BlueOak

(a) Relevant Provisions of the License Agreement

491. Clause 2.1 of the License Agreement authorized BlueOak Resources to grant a sub-license of Tetronics' technology to BlueOak. [RX-109] BlueOak Resources entered into a sub-licensing agreement with BlueOak requiring BlueOak to adhere to the terms of the Licensing Agreement. [RWS9 (Bradoo) ¶11]

492. Clause 2.3.5 of the License Agreement states:

> 2.3.5 the Licensee shall be responsible to the Licensor for any failure of each sub-licensee to observe and perform the terms and conditions of its sub-licence,

493. Clause 1 of the License Agreement defines "Confidential Information" as (in relevant part) "all information which is commercially sensitive or of a secret nature (including Know-How), or information which is marked confidential, or which is orally stated to be confidential, relating to any and all aspects of the business of the parties…."

494. Clause 5 of the License Agreement states (in relevant part):

> **5. CONFIDENTIALITY**
>
> 5.1 Each party agrees during the term of this Agreement and after expiry or termination of this Agreement howsoever arising to keep secret and confidential all Confidential Information obtained from the other. Each party further agrees to use such Confidential Information exclusively for the purposes of this Agreement, and only to disclose the same as follows:
>
> > 5.1.1 (in the case of the Licensee) to its directors or employees concerned in the manufacture or use of the Furnace and operation of the Process; and
> >
> > 5.1 .2 (in the case of the Licensor) to its directors and employees concerned in the supply and operation of the Process and the Furnace.

5.2 The provisions of clause 5. 1 shall not apply to Confidential Information or other information which the Licensor or the Licensee (as the case may be):

5.2.1 …

5.2.2 is required to disclose in the course of servicing or repair of the Equipment and (subject to the agreement of the other party) in the course of marketing or of sales; ….

(b) The Parties' Contentions

495. Tetronics does not contend that BlueOak Resources itself disclosed Tetronics' Confidential Information to Hatch. [CPHB1 ¶356] Tetronics alleges that: [CPHB1 ¶¶351-356]

a. In its sublicense BlueOak agreed with BlueOak Resources to comply with the License Agreement;

b. BlueOak did not comply with Clause 5 of the License Agreement when it disclose Confidential Information to Hatch; and

c. Under Clause 2.3.5 of the License Agreement BlueOak Resources is liable to Tetronics for BlueOak's breach of the obligation in its sub-license to comply with the Clause 5 of the License Agreement.

496. One counter-intuitive consequence of this argument (if correct) is that, theoretically, BlueOak Resources could be liable under the License Agreement for a disclosure of Confidential Information by BlueOak, in circumstances where BlueOak itself is not liable under the Contract. This could theoretically be the case if the confidentiality provisions in the License Agreement are more restrictive than those in the Contract so that a disclosure by BlueOak is precluded by the former but permitted by the latter. In their Memorials and Post-Hearing Briefs the Respondents do not challenge this proposition. Instead, BlueOak Resources simply argues that BlueOak's disclosures to Hatch were permitted under sub-Clause 5.2.2 of the License Agreement because they were "required to disclose in the course of servicing or repair of the Equipment …." [RPHB1 ¶¶299-301] Tetronics submits that Hatch was not retained to and did not engage in any work constituting "servicing or repair of Equipment." [CPHB1 ¶¶357,358]

(c) Analysis

497. The definition of "Confidential Information" in the License Agreement differs from that in the Contract. As a result, I have considered whether the information that BlueOak gave to Hatch about the design and performance of the Second System – detailed above - is "commercially sensitive" information as described in the License Agreement definition. I find that it is. This is information that a reasonable business person in Tetronics position would not wish to be disclosed to a competitor.

498. The evidence is clear that, when it received information from BlueOak, Hatch was not engaged in "servicing or repair of Equipment" as BlueOak Resources contends. Hatch was engaged to provide an assessment of certain aspects of the Second System (the issues of molten alloy not reaching the desired tapping temperature and the functioning of the Off-Gas System) and unrelated "Phase II" matters. Sauter acknowledges that Hatch did not repair or replace any Equipment and was not retained to do so. [TR Day 6 (Sauter) pp.15,16] Garas agrees that it would not have been accurate to state that Hatch was on site to "repair or replace" the furnace [TR Day 6 (Garas) p. 55]

499. As a result, I find that the exception under Clause 5.2.2 of the License Agreement, on which BlueOak Resources relies, does not apply.

(d) Conclusion

500. For the reasons I have stated, and based on the arguments presented, I find that BlueOak Resources is liable to Tetronics for any legal consequences of BlueOak's disclosure of "Confidential Information" (as defined in the License Agreement) to Hatch.

(O) BlueOak's Alleged Fraud: The Comfort Letter

(a) New York Law Concerning Fraud Claims

501. As there are both claims and counterclaims in this proceeding alleging fraud, this is a convenient place to summarize applicable principles of New York law with respect to such matters.

502. "The elements of a cause of action sounding in fraud are a material misrepresentation of an existing fact, made with knowledge of the falsity, an intent

to induce reliance thereon, justifiable reliance upon the misrepresentation, and damages" [CLX-5, *Introna v. Huntington Learning Ctrs., Inc.,* 78 A.D.3d 896, 898, 911 N.Y.S.2d 442 (N.Y. App. Div. 2010); see CLX-6, *Fromowitz v. W. Park Assoc., Inc*., 106 A.D.3d 950, 951, 965 N.Y.S.2d 597 (N.Y. App. Div. 2015); CLX-7, *Mitchell v. Diji,* 22 N.Y.S.3d 464, 466 (N.Y. App. Div. 2015) (CLX-7); RLX-017, *Sommer v. Fed. Signal Corp.,* 593 N.E.2d 1365, 79 N.Y.2d 540, 552 (N.Y. 1992);CLX-86, *Levin v. Kitsis,* 82 A.D.3d 1051, 920 N.Y.S.2d 131 (N.Y. App. Div. 2011) (a cause of action sounding in fraud must state that "defendant knowingly misrepresented or concealed a material fact for the purpose of inducing another party to rely upon it, and that the other party justifiably relied upon such misrepresentation or concealment to his or her own detriment")]

503. A cause of action for fraudulent concealment requires, in addition to the foregoing, that defendant had a duty to disclose material information and that it failed to disclose. [CLX-87, *Gomez-Jimenez v. New York Law School*, 103 A.D.3d 13, 18-19; 956 N.Y.S.2d 54 (2012) (CLX-87). A mere contractual relationship between the parties is not enough to create the special relationship required in order for non-disclosure to be actionable. [CLX-88, *Sehera Food Servs. Inc. v. Empire State Bldg. Co. L.L.C.,* 903 N.Y.S.2d 364, 365 (N.Y. App. Div. 2010); CLX-89, *Manti's Transp., Inc. v. C.T. Lines, Inc*., 892 N.Y.S.2d 432, 434 (N.Y. App. Div. 2009)]

504. Under the "Economic Loss Doctrine," New York has a "bright line rule" barring tort claims for contractually based economic losses. [CLX-94, *Shred–It USA, Inc. v. Mobile Data Shred,* 222 F.Supp.2d 376, 379 (S.D.N.Y. 2002) (applying economic loss doctrine to bar plaintiff's fraud claim)] In addition, "[w]here a claim to recover damages for fraud is premised upon an alleged breach of contractual duties, and the allegations with respect to the purported fraud do not concern representations which are collateral or extraneous to the terms of the parties' agreement, a cause of action sounding in fraud does not lie." [CLX-92, *Renaissance Equity Holdings v. Al-An Elevator Maint. Corp*., 121 A.D.3d 661, 664 (2nd Dep't 2014), quoting CLX-6, *Fromowitz v. W. Park Assoc., Inc.,* 106 A.D.3d 950, 951; 965 N.Y.S.2d 597 (N.Y. App. Div. 2015) (CLX-6); CLX-95, *Salvador v. Uncle Sam's Auctions & Realty,* Inc. ex rel. Passonno, 307 A.D.2d 609, 611; 763 N.Y.S.2d 360, 362 (N.Y. App. Div. 2003); CLX-94, *Shred–It USA, Inc. v. Mobile Data Shred,* 222 F.Supp.2d 376, 379 (S.D.N.Y.2002)

(b) The Parties' Contentions

505. In the Comfort Letter BlueOak stated (in relevant part):

1. As far as we are aware there are no current circumstances that would give rise to a demand for breach of the underlying supply contract on the assumption that the previous Guarantee were still in place.

506. Tetronics contends that by the Comfort Letter BlueOak made a representation to Tetronics as to BlueOak's state of mind, namely: that BlueOak did not deem Tetronics to be in breach of the Contract. Tetronics contends that this representation of fact was not true when it was made, as BlueOak actually believed that Tetronics was in breach of the Contract. [CPHB1 ¶¶362-364] Tetronics contends that it relied on BlueOak's representation by continuing its efforts to arrange for the issuance of the HSBC Bond, that after the HSBC Bond was issued BlueOak obtained payment under the HSBC Bond and that, as a result, Tetronics became liable to HSBC for the sum of £3,080,000. [CPHB1 ¶365]

507. BlueOak contends that Tetronics has "abandoned" its fraud claims, by failing to cross-examine on the relevant facts, so that the evidence relied on by BlueOak is uncontradicted. [RPHB1 ¶323] BlueOak contends that the statement made in the Comfort letter was true, as it was not until BlueOak received the Final Hatch Reports that it became aware of the circumstances that cause it to issue the Default Notice. [RM3 ¶115]

508. BlueOak further contends that Tetronics failed to establish the required elements for a claim of fraud under New York law. [RPHB1 ¶¶323-328; RM3 ¶¶24-31,37-38; RPHB2 ¶¶122-132] In particular, BlueOak contends that BlueOak's representations in the Comfort Letter did not induce Tetronics' decision to post the HSBC Bond because Tetronics was contractually required to post a performance bond; [RM3 ¶114] BlueOak also submits that, while the Sole Arbitrator is not necessarily bound by the decisions of the Emergency Arbitrator and the High Court, he may review the reasoning of the prior tribunals in coming to their conclusions to deny Tetronics' requested relief and allow the draw on the HSBC Bond. [RPHB1 ¶¶326-328]

(c) Analysis

509. The damages Tetronics claims for this alleged fraud (£3,080,000) are the same damages as it claims for BlueOak's breach of the Contract by wrongfully drawing on the HSBC Bond. [CPHB1 ¶366] Assuming, without deciding, that the representation in the Comfort Letter was knowingly false, the alleged act of reliance is causing the HSBC Bond to be issued. The issuance of the HSBC Bond did not cause Tetronics to

lose the £3,080,000. The loss of those funds was caused by BlueOak's breach of the Contract by drawing on the HSBC Bond when it was not entitled to do so. But for that breach of contract, there would have been no loss.

510. As the authorities cited above establish, under New York law, proof of damages is an essential element of a successful claim for fraudulent misrepresentation. [See also, CLX-9, *Bridgestone/Firestone, Inc. v. Recovery Credit Servs., Inc.,* 98 F.3d 13, 19-20 (2d Cir. 1996); CLX-8, *B&M Linen, Corp. v. Kannegiesser, USA, Corp*., 679 F. Supp. 2d 474, 484 (S.D.N.Y. 2010).

511. Below, I describe why the £3,080,000 claimed is recoverable as damages for breach of the Contract. As the damages claimed for fraud were not caused by Tetronics' reliance on the allegedly false representation, and as they are recoverable as damages for breach of contract, I find that Tetronics' fraud claim must be rejected.

(d) Conclusion

512. For the reasons I have stated, Tetronics' claim for damages for fraud based on the Comfort Letter is rejected.

(P) BlueOak's Alleged Fraud: Misrepresenting the Required Tapping Temperature

(a) The Parties' Contentions

513. In summary, Tetronics submits that: [CPHB1 ¶¶376-375]

a. BlueOak repeatedly represented to Tetronics during the course of attempted commissioning that a metal alloy temperature of 1600°C was required for the alloy to granulated;

b. these statements are, in effect, representations that the metal alloy could be granulated at temperature of 1600°C, which was not true, because molten alloy temperature losses between the tap and the granulator would have precluded granulation;

c. When the statements were made, BlueOak knew that BlueOak's "own design, layout and equipment for transferring alloy to the granulator after it was tapped from the Tetronics-supplied furnace taphole, would result in

unsuccessful granulation" even if the 1600°C alloy tapping temperature was achieved; and

d. Tetronics relied on these statements in an effort to accommodate BlueOak, and in the process incurred costs (£1,012,142) that it would not otherwise have incurred.

514. In summary, BlueOak contends that Tetronics has failed to establish as facts (i) that the metal alloy could not have been granulated if the tapping temperature was 1600°C or (ii) that BlueOak was aware that was the case. BlueOak contends that Tetronics' submissions are based entirely on a misinterpretation of Morrow's evidence, and ignore explanations and clarifications given by Morrow in his witness statements. BlueOak emphasizes that Tetronics did not choose to cross-examine Morrow so that there is no basis to disbelieve what he said in his witness statement. [RPHB2 ¶¶119,120]

(b) Analysis

515. It is highly implausible that during the commissioning process, when the parties were still working toward the goal of a fully operational system, BlueOak insisted that Tetronics achieve an alloy temperature which BlueOak knew would not be sufficient. It is not surprising that the evidence falls far short of establishing such a proposition.

516. Even assuming, without deciding, that an alloy temperature of 1600°C was not sufficient to permit granulation, the evidence does not establish that BlueOak was aware of this when it insisted that alloy not be tapped until that temperature was reached. To the contrary, the evidence clearly shows that based on what it had been told by Morrow, BlueOak reasonably and honestly believed that an alloy temperature of 1550-1600°C would be sufficient for granulation.

517. The Granulation Manual prepared by Economy Industrial, the supplier of the granulator, explained the importance of alloy temperature and the need (for effective granulation) of a minimum temperature of 150°C above the liquidus temperature needed for granulation (which it said was 1450°C, assuming a specific alloy composition). [CX-007; CX-008] Morrow of Economy Industrial states that "[t]o be successfully granulated, the alloy needed to enter the granulator at as close to 1450°C as possible, or higher." He states that he recommended to BlueOak that the

alloy temperature at the time of tapping needed to be approximately 1550-1600°C. If the alloy is tapped from the furnace at 1600°C, Morrow's evidence is that it is still able to withstand cooling by up to 100-150°C as it is transported to the granulator. [RWS11 (Morrow) ¶6]

518. As the evidence does not establish an essential element of the fraud claim (BlueOak's knowledge that its representation was untrue) Tetronics' claim fails.

(c) Conclusion

519. For the reasons I have stated, Tetronics' claim for damages for fraud based on representations concerning the sufficiency of a 1600°C alloy temperature is rejected.

(Q) Tetronics' Alleged Fraud: Concealing its Knowledge that the Second System Would Not Work and Refusing to Cooperate in Engaging an Independent Consultant

520. BlueOak contends that Tetronics committed fraud by actively concealing from BlueOak, after July 2017, the fact that the Second System's design would never work as promised and by refusing to cooperate in engaging an independent consultant.

521. This tort claim is based on the same evidence as BlueOak's failed claims for breach of an implied covenant of good faith and fair dealing by (i) providing deceptive site reports and (ii) refusing to cooperate with BlueOak in hiring an outside advisor. [RPHB1 ¶¶241-245; RM1 ¶¶140-152; RM2 ¶¶192-198; RM3 ¶¶107,108] For reasons stated above, I have found that:

a. "there is no evidence of concealment of design flaws;"

b. "the evidence shows that BlueOak gave Tetronics the choice to participate in the hiring or not;"

c. "the evidence shows that Tetronics was genuinely sceptical about the need to hire an outside expert, and communicated that fact to BlueOak, so that Tetronics was not acting arbitrarily or with a view to defeating BlueOak's objectives;" and

d. "BlueOak was not prevented from engaging a third-party engineer and in fact did so."

522. These findings of fact are fatal to BlueOak's fraud claim.

523. For the reasons I have stated, I find that BlueOak's claim for damages for fraud based on Tetronics' alleged concealment and refusal of cooperation must be rejected.

(R) Tetronics' Alleged Fraud: Misrepresenting Tetronics' Financial Condition

(a) The Parties' Contentions

524. BlueOak alleges that Tetronics committed fraud by falsely representing to BlueOak that Tetronics would become bankrupt if it did not receive a milestone payment before it was due under the Contact, and thereby inducing BlueOak to make the advance payment. [RPHB1 ¶¶241-245; RM1 ¶¶140-152; RM2 ¶¶192-198; RM3 ¶¶107,108]

525. Tetronics denies that such a representation was made and contends that the advance payment was made as part of an agreement under which $1,000,000 held in escrow was divided between Tetronics and BlueOak. [CPHB1 ¶¶252,253]

(b) Analysis

526. On 14 March 2017 Conway wrote to Garas asking BlueOak to "consider the possibility" of making an early payment of the $1,000,000 milestone payment that would otherwise not be due until the commissioning milestone had been achieved. [CX-138] Conway stated:

> We appreciate this is not a typical request but with the programme being behind the original schedule, we are faced with incurring circa £40,000 of costs as a result of hedging against foreign exchange impacts which we do not have a route to closing out and clearly we would like to avoid those costs.

527. The proposal was that of the $1,000,000 held in an escrow account pending achievement of commissioning, $741,173.24 would be paid to Tetronics and the balance would be paid to BlueOak to satisfy Tetronics' liability for liquidated damages for late delivery of the Replacement Equipment to the site. BlueOak

accepted the proposal and the funds were disbursed to Tetronics and BlueOak as agreed. [CX-138]

528. As evidence of the alleged representation, BlueOak relies on (i) a parenthetical statement by Garas in his first witness statement that the advance payment was made "because Tetronics told BlueOak that otherwise Tetronics risked insolvency" and (ii) statements made by Rumbol and Tetronics in the Emergency Arbitrator proceedings that Tetronics risked insolvency if the HSBC Bond draw was allowed and HSBC demanded immediate indemnification. [RM1 ¶¶149-152; RPHB1 ¶244; RWS1 (Garas) ¶84; RX-078,-079]

529. The advance payment was made before the delivery of the Emergency Arbitrator materials. BlueOak cannot have relied on statements in those materials when deciding to make the advance payment. The statements filed in the Emergency Arbitrator proceedings addressed the financial consequences of having to indemnify HSBC for £3,080,000 in January 2018, not the consequences of failing to receive $741,173.24 in March 2017. These documents are not evidence of the representation that is the basis of the fraud claim.

530. Rumbol denies that Tetronics told BlueOak that it would be bankrupt without the advance payment. His denial was not challenged on cross-examination. [CWS134 ¶10] In these circumstances, I do not find Garas' parenthetical statement - about insolvency, not bankruptcy – to be convincing evidence that a specific fraudulent representation was made and relied upon. His evidence is more likely an "after the fact" characterization of what was said to him, or he (like BlueOak's submissions) may incorrectly confuse what was said at the time of the advance payment with what was said during the Emergency Arbitrator proceedings.[5]

531. I find that BlueOak has failed to establish that the alleged statement providing the foundation of its fraud claim was made.

(c) Conclusion

[5] In his First Witness Statement Garas also states; "Tetronics repeatedly asked BlueOak to make additional payments and cover additional costs, claiming that otherwise Tetronics could become insolvent. Tetronics made similar statements in the Emergency Arbitration and in this arbitration. BlueOak made several such payments in reliance on Tetronics' representations." [RWS1 ¶38] The only claim made by BlueOak relates to the specific advance payment discussed above, based on Garas' evidence in ¶44.

532. For the reasons I have stated, I find that BlueOak's claim for damages for fraud inducing the advance payment must be rejected.

(S) Tetronics' Alleged Negligent Misrepresentations

(a) Applicable Principles of New York Law

533. Under New York law, a party commits negligent misrepresentation when (i) there is the existence of privity or a privity-like relationship imposing a duty to a party to impart correct information, (ii) the information was incorrect, and (iii) there was reasonable reliance on the information. [RLX-008, *Ginsburg Development Companies, LLC v. Carbone, 134* A.D.3d 890, 22 N.Y.S.2d 485 (N.Y. App. Div. 2015); see also RLX-016, *Ossining Union Free School Dist. V. Anderson*, 73 N.Y.2d 417, 425 (N.Y. 1989); CLX-108, *J.A.O. Acquisition Corp. v. Stavisky*, 863 N.E.2d 585, 587 (N.Y. 2007)]

534. To satisfy the "special relationship of trust or confidence" requirement, a simple arm's length business relationship is not enough. [CLX-110, *United Safety of America, Inc. v. Consolidated Edison Co. of New York, Inc*., 213 A.D.283, 286; 623 N.Y.S.2d 591, 593 (N.Y. App. Div. 1995); CLX-111, *ESE Funding SPC Ltd. v. Morgan Stanley,* 68 A.D.3d 676; 891 N.Y.S.2d 400 (N.Y. App. Div. 2009); See also, CLX-103, *Manhattan Motorcars, Inc. v. Automobili Lamborghin*i, S.p.A., 244 F.R.D. 204, 215 (S.D.N.Y. 2007); CLX-112, Silvers v. State, 893 N.Y.S.2d 12, 14 (N.Y. App. Div. 2009) ("the arm's-length business relationship . . . is not generally considered to be of the sort of a confidential or fiduciary nature that would support a cause of action for negligent misrepresentation.")]

535. A negligent misrepresentation claim should be dismissed where it is merely a breach of contract claim converted into a tort action, absent the violation of a legal duty independent of that created by the contract. [CLX-115, *Scott v. KeyCorp*, 669 N.Y.S.2d 76, 79 (N.Y. App. Div. 1998)]

536. Under New York law, the economic loss doctrine has been applied to dismiss, at the initial pleadings stage, negligent misrepresentation claims. [CLX-103, *Manhattan Motorcars, Inc. v. Automobili Lamborghini, S.p.A*., 244 F.R.D. 204, 220 (S.D.N.Y. 2007); see also, CLX-12, *Weisblum v. Prophase Labs, Inc*., 88 F. Supp. 3d 283, 297 (S.D.N.Y. 2015)); and[CLX-13, *Fabbis Enterprises, Inc. v. Sherwin-Williams Co*., 40 Misc. 3d 1203(A), 975 N.Y.S.2d 708, 2013 WL 3242798 (N.Y. City Ct. June 27, 2013)]

(b) The Parties' Contentions

537. In the alternative to its fraud allegations, BlueOak contends that: [RPHB1 ¶¶246-248; RM1 ¶¶153-158; RM2 ¶¶199-203; RM3 ¶¶109,110]

    a. Tetronics was under a duty to impart correct and truthful information to BlueOak concerning, among other things, whether the furnace's design and commission was possible;

    b. Tetronics knew and understood at least as early as July 2017 that the furnace's design was irreparably flawed;

    c. Even after inquiry from BlueOak, Tetronics did not provide BlueOak with correct and truthful information but instead continually misled BlueOak;

    d. BlueOak's reliance on Tetronics' false representations was reasonable, and resulted in significant damages;

    e. Tetronics misrepresented its financial condition to BlueOak; and

    f. BlueOak relied on this misrepresentation to its detriment by making "several … payments in reliance on Tetronics' representations."

538. Tetronics contends: [CPHB1 269-277]

    a. The requirement for a special relationship of trust and confidence is not met in this case because Tetronics and BlueOak were sophisticated, arms-length contracting parties;

    b. BlueOak's tort claim is barred by the "bright line" economic losses doctrine of New York law which bars recovery in tort of contract-based losses;

    c. The evidence does not establish that Tetronics (i) conveyed incorrect or incomplete information to BlueOak concerning the viability of the Second System or (ii) misrepresented its own financial condition.

(c) Analysis

539. I find that BlueOak's claim fails for both factual and legal reasons.

540. The evidence relied upon by BlueOak in support of its contention that "Tetronics Failed to Disclose to BlueOak that the Furnace's Design Was Irreparably Flawed" is set out in its First Memorial. [RM1 ¶¶143-148] BlueOak refers to (i) "misleading and one-sided inaccuracies in its daily reports to BlueOak" (ii) alleged efforts "to prevent BlueOak from seeking a second opinion" on causes for the delays with the furnace's commissioning and (iii) the internal communication in which, after his meeting with Hatch, Stachowski stated that Hatch's conclusions "were actually very much in line with the conclusions" he had drawn.

541. Each of these factual contentions formed the basis of a claim by BlueOak for breach of the implied covenant of good faith and fair dealing. The first allegation has already been found to be untrue. As to second allegation, I have found that Tetronics had no obligation to participate in the hiring of Hatch and made clear its reasons for doing so. I have found, also, that Hatch did not state and Stachowski did not agree that the design of the furnace was irreparably flawed. I have found that Tetronics did not with-hold any such information.

542. BlueOak also relies on a 13 October 2017 internal email exchange in which one Tetronics representative wrote "[t]his furnace is unique, in that it is difficult to achieve reproducibility of results 😊" to which Deegan responded "I wouldn't be as polite!" [RX-055] BlueOak submits that this is an acknowledgement that the Second System was "irreparably flawed", a fact which was not communicated to BlueOak. There is, however, no statement or acknowledgement in Tetronics documents of irreparable flaws, and there is no evidence of concealment.

543. To the contrary, the evidence shows that before Tetronics temporarily left the site in October 2017, there were frank discussions with BlueOak about problematic issues and corrective measures. As described earlier, the parties met to discuss these matters. Tetronics invested resources in identifying solutions and acquiring and installing new equipment. None of this conduct is consistent with the suggestion that Tetronics recognized that the project was doomed to fail.

544. Similarly, for reasons already discussed the evidence does not establish that Tetronics misrepresented its financial condition.

545. In addition to the lack of an evidentiary foundation, I find that BlueOak's claim of negligent misrepresentation fails for legal reasons. The relationship between

Tetronics and BlueOak was a commercial, contractual relationship between two sophisticated parties. It was not the kind of special relationship that must be established under New York law to support a claim of negligent misrepresentation. In addition, BlueOak in substance is seeking to recover damages in tort for Tetronics' alleged failure to deliver what was promised under the Contract. The vast majority of the damages that BlueOak claims (return of payments made under FEED & Supply Contract, the repayment of the allegedly unearned advance payment for Second System and additional costs incurred for spare parts and related items} all relate directly to the Contract. The economic loss rule bars BlueOak from recovering in tort such damages as it is unable to recover in contract.

(d) Conclusion

546. For the reasons I have stated, I find that BlueOak's claim for damages for negligent misrepresentation must be rejected.

(T) Damages Claimed by Tetronics for Breach of Contract

547. Tetronics' claims damages for breach of contract as follows: [CPHB1 ¶¶11, 27-30, 35, 117,118,137-140,289-321; CPHB2 ¶¶145-147, 167-179]

Outstanding Contract Payments	£2,111,392
Funds Payable Re: HSBC under Bond	£3,080,000
Additional Out of Scope Work	£1,012,142
Loss of Market Share	£21,000,000
Total (excluding interest)	**£27,203,534**

(a) Claim for Damages in the Amount of Outstanding Contract Payments (£2,111,392)

548. The sum claimed under this head of damages has been calculated by Tetronics' damages experts, Glen Sheets and Erich Kerr of Stout Disputes Consulting (**Stout**). [CXR20 ¶¶129,179 (Stout First, Second and Third Reports; Ex. "A" – Stout's Damages Recalculation]

549. Stout calculated this sum by deducting total payments received by Tetronics under the Contract, in relation to both the First and Second Systems, from the total amounts Tetronics is entitled to receive,[6] assuming that it is entitled to receive payments for the Second System for the SUT 1, SUT 2 and FAT milestones that were

[6] Stout did not include payments in relation to the First System for milestones that were not achieved due to the First System failure. [CXR20 ¶42]

not actually achieved and royalty payments that were to be made over a period of three years thereafter.[7] [CXR20 ¶¶41-48]

550. BlueOak does not dispute the mathematics of Stout's damages calculation. BlueOak contends, however, that there is no basis for Tetronics to claim as damages the payments it was not contractually entitled to receive until it achieved the SUT 1, SUT 2 and FAT milestones and received certificates of completion. [RPHB1 ¶335] BlueOak also submits that Tetronics has failed to prove that "but for" BlueOak's breaches, Tetronics would have achieved SUT 1, SUT 2 and FAT and become entitled to future royalty payments. BlueOak notes also that the damages calculation assumes that SUT 1, SUT 2 and FAT would have been achieved long after the dates set out in the "operative" VA Gantt Chart. [RPHB1 ¶¶335, 336]

551. BlueOak also submits that "to the extent Tetronics is seeking to recover the £2,111,392 in contract damages under a theory of lost opportunity or lost profit, such a remedy is squarely precluded under Clause 12.1(a) of VA02." [RPHB1 ¶¶337]

552. Tetronics contends that it is legally entitled to the full amount of the unpaid milestones and royalty payments because it was BlueOak's actions that prevented the milestones from being achieved, submitting that under New York law, "a party who frustrates the performance of a contractual obligation cannot then assert the other party's failure of performance … in defense of a breach of contract claim brought by the other party …." [CPHB1 ¶320] The New York legal authorities cited by Tetronics in support of this proposition are *Feiliks Int'l Logistics HK Ltd v Feiliks Global Logistics Corp.,* 685 Fed. Appx. 59, (2d Cir. 2017) [CLX-61] (***Feiliks***) and *RDB Bedford Associates, LLC v. Ricky's Williamsburg, Inc.,* 91 A.D.3d 16, 933 N.Y.S.2d 3 (N.Y. App. Div. 2011) [CLX- 64] (***RDB Bedford***).

553. In *Feiliks* the plaintiff made a loan to the defendant to assist in starting a business in which the plaintiff and defendant both had an interest. The plaintiff then took steps that the court found undermined the business. The plaintiff sued the defendant for repayment of the loan. The court dismissed the claim. In upholding that dismissal the Court of Appeals said (emphasis added): [at p. 61]

[7] Stout included in amounts that Tetronics was contractually entitled to receive the present value as of 31 May 2019 of future royalty payments totalling £420,000. He calculated the present value to be £395,392. [CXR20 ¶44, Ex. C.1]

> With respect to Feiliks US, the district court's finding, perhaps more accurately phrased as a determination that appellants had breached their implied duty of good faith and fair dealing under the loan agreement by undermining the company's business—including by diverting customers to Feiliks US's competitors—is amply supported by the record. This frustration of performance excused Feiliks US's failure to repay the loan. See *Lowell v. Twin Disc, Inc*., 527 F.2d 767, 770 (2d Cir. 1975) ("[W]henever the cooperation of the promisee is necessary for the performance of the promise, there is a condition implied that the cooperation will be given." (internal quotation marks and alterations omitted)); *Grad v. Roberts*, 14 N.Y.2d 70, 75, 248 N.Y.S.2d 633, 198 N.E.2d 26 (1964) ("Persons invoking the aid of contracts are under implied obligation to exercise good faith not to frustrate the contracts into which they have entered.")

554. *Feiliks* was not a case of awarding damages for breach of the implied covenant of good faith and fair dealing or for breach of an implied duty of cooperation. It was a breach of contract case. The plaintiff's breaches of those duties, however, were allowed to be raised as a defense to the claim for breach of contract. FN 2 in the judgment notes that these defences had been expressly pleaded.

555. In *RDB Bedford* the Court found that the defendant had anticipatorily repudiated its obligation to lease a property that plaintiff proposed to purchase from a third party. The defendant's obligation to lease was conditional on the plaintiff acquiring the property by a specific date. The defendant knew that the plaintiff could not complete the purchase of the property unless the lease was in place. When the defendant repudiated the lease, the property purchase did not complete. The defendant submitted that it had no obligation under the lease because the pre-condition to its liability had not been satisfied. The court said (emphasis added): [at p. 23]

> A party cannot prevent the fulfillment of a contractual condition and then argue failure of that condition as a defense to a claim that it breached the contract (see *Rachmani Corp. v 9 E. 96th St. Apt. Corp*., 211 A.D.2d 262, 270 [1995] ["failure of the condition cannot be utilized as a defense where, as here, the party resisting the contractual obligation has affirmatively acted to obviate its fulfillment"]; *Sunshine Steak, Salad & Seafood v W. I. M. Realty*, 135 A.D.2d 891, 892 [1987]). Here, the side letter that defendant signed made clear that plaintiff could not close without the lease. By pulling out of the lease, Ricky's frustrated the ability of plaintiff to close.

556. In *RDB Bedford* the court did not quantify damages. The Court stated, however: [at p. 23, 24]

> Defendants claim they cannot be liable for consequential damages in the form of lost profits or an acceleration of rent under the lease (compensatory damages) because the lease and the side letter bar this sort of liability. However, the limitation on damages these documents may contain is not an issue relating to liability, but rather goes to the proper calculation of damages. As noted, this issue is not before us.

557. Tetronics submits that because BlueOak prevented SUT 1, SUT 2 and FAT from being achieved, and consequently prevented Tetronics from receiving both the milestone and royalty payments, BlueOak cannot rely on Tetronics failure to achieve the milestones as a defence to Tetronics' claim.

558. Based on the arguments presented and the authorities cited by the parties, the following questions must be asked when considering Tetronics' theory of damages:[8]

    a. Has Tetronics shown on balance of probabilities that, but for BlueOak's wrongful termination, SUT 1, SUT 2 and FAT would have been achieved such that the payments claimed would have become due to Tetronics?

    b. Does Clause 12.1(a) exclude liability for the damages claimed?

559. On the whole of the evidence discussed above, I find that it is more likely than not that, but for BlueOak's wrongful termination of the Contract (and assuming no unwarranted interference or contractual non-compliance by BlueOak), SUT 1, SUT 2 and FAT would have been achieved and the corresponding milestone payments and royalty payments would have been payable to Tetronics. The evidence shows that in November and December 2017 and January 2018 Tetronics had devoted significant resources to identifying corrective measures, acquiring new parts and equipment and installing that equipment on the site. The evidence shows that Tetronics' team was on the site in early February and was ready to commence the commissioning process when termination occurred. For reasons set out above, the inability to heat the molten alloy to a temperature of 1550°C or 1600°C would not

[8] BlueOak has not argued that, even on the legal theory relied on by Tetronics, the costs that Tetronics would have incurred after the termination date in order to achieve the milestones should be taken into account when calculating damages. No evidence as been tendered concerning such costs.

have been a legitimate impediment to achieving SUT 1, SUT 2 or FAT. For reasons set out above, it would not have been a breach of the Contract by Tetronics, and it would not have disentitled Tetronics to payment, if these milestones had been achieved on the dates Tetronics uses for the purposes of its damages calculation - 19 February 2018 for SUT 1, 27 February 2018 for SUT 2 and 23 March 2018 for FAT – even though those dates are after the dates shown in the Gantt Charts. [CXR20 ¶59]

560. As a result, I find that it is more likely than not that Tetronics would have received £713,500 by 19 February 2018 (for SUT 1), £293,500 by 27 February 2018 (for SUT 2) and £709,000 by received no later than 23 March 2018 (for FAT). Similarly, I find that it is more likely than not that Tetronics would have received the fixed royalty payments of £100,000 on 27 February 2019, £100,000 on 27 February 2020 and £220,000 on 27 February 2021.

561. I do not agree with BlueOak's contention that the recovery of these damages is precluded by Clause 12.1(a) of the Contract. Clause 12.1(a) does not, as BlueOak submits, exclude liability for damages for lost opportunity or lost profits. Clause 12.1(a) limits the quantum of damages that either party is entitled to recover. It states (emphasis added):

> 12. **Limitation of Liabilities and Liquidated Damages**
>
> 12.1 (a) NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED IN THIS CONTRACT AND TO THE MAXIMUM EXTENT LEGALLY ALLOWED, THE TOTAL AGGREGATE LIABILITY OF A PARTY (ARISING OUT OR IN CONNECTION WITH SUCH AS BUT NOT LIMITED TO ANY BREACH OF CONTRACT, NEGLIGENCE, TORT, LIQUIDATED DAMAGES, SPECIFIC PERFORMANCE, TERMINATION, CANCELLATION INCLUDING, PAYMENT OR THE REPAYMENT OF THE CONTRACT PRICE, REPLACEMENT WORKS PRICE OR PARTS THEREOF, FUNDAMENTAL BREACH, BREACH OF WARRANTIES, MISREPRESENTATION, NONPERFORMANCE, NON-PAYMENT, OR ANY OTHER) WHETHER BASED IN CONTRACT, IN TORT, IN EQUITY, ON STATUTE, AT LAW OR ON ANY OTHER THEORY OF LAW, SHALL NOT EXCEED THE CONTRACT LIABILITY LIMIT. THE PARTIES ACKNOWLEDGE THAT THE REMEDIES PROVIDED IN THIS CONTRACT ARE EXCLUSIVE AND IN LIEU OF ALL OTHER REMEDIES AVAILABLE TO BUYER AT LAW, IN CONTRACT, IN TORT, IN STATUTE OR IN EQUITY OR IN ANY OTHER THEORY OF LAWS.

562. Clause 1 of the Conditions to the Contract defines "Contract Liability Limit" as "the limit on liability specified in Schedule 2." Schedule 2 to the Contract states that the Contract Liability Limit is "The Contract Price." Clause 1 of the Conditions to the Contract states that "Contract Price" means the sum of £7,576,250, plus any amounts by Buyer from and after the date hereof in respect of Change Orders (as defined in Section 6.4)." As there were no Change Orders, the Contract Liability Limit is £7,576,250. The amount of damages claimed under this heading is £2,111,392.

563. For the reasons I have stated, and subject to the Contract Liability Limit on aggregate damages, I find that Tetronics is entitled to an award of damages in the amount of £2,111,392 for breach of contract as a result of BlueOak's wrongful termination of the Contract.

(b) Claim for Damages in the Amount of the HSBC Bond (£3,080,000)

564. Elsewhere in this award I determine that BlueOak materially breached the Contract by drawing on the HSBC Bond. The amount it received from HSBC was £3,080,000. The evidence shows that Tetronics was liable to indemnify HSBC for amounts paid under the HSBC Bond. [CWS69 (Rumbol) ¶¶73-75] This is the usual commercial arrangement as between a bank issuing a bond and its customer and must have been foreseen by BlueOak. BlueOak does not suggest otherwise. BlueOak argues that the HSBC Bond proceeds were used by BlueOak "to pay off lenders and attempt to rectify the dying System, a use contemplated by the parties" and that, as result, Tetronics "cannot recover this amount." [RPHB1 ¶¶341,342]

565. I do not agree with BlueOak that Tetronics is not entitled to the award it seeks. The fact that BlueOak spent bond proceeds to reduce its liabilities to lenders does not negate the fact that BlueOak was not entitled to the proceeds. If, as intimated, BlueOak spent some of the money to "rectify" the Second System as result of wrongdoing by Tetronics, then BlueOak would have had a counter-claim for the amount spent or could have claimed a set-off. No such claims have been established.

566. For the reasons I have stated, and subject to the Contract Liability Limit on aggregate damages, I find that Tetronics is entitled to an award of £3,080,000 as damages for breach of contract by wrongfully drawing on the HSBC Bond.

(c) Claim for Damages for Additional Out of Scope Work (£1,012,142)

567. Tetronics claims £1,012,142 as costs incurred as a result of BlueOak's alleged fraud in relation to the required tapping temperature. [CPHB1 ¶¶374,375] For reasons set out above, I have rejected Tetronics' fraud claim. As a result, these damages are not recoverable.

(d) Claim for Damages for Loss of Market Share (£21,000,000)

568. Tetronics claims the sum of £21,000,000 as damages for the wrongful disclosure of Confidential Information. As described above, while BlueOak did not breach the Contract by disclosing information to Hatch, BlueOak Resources is liable under the License Agreement for any damages caused by BlueOak's disclosure of commercially sensitive Confidential Information to Hatch.

569. The evidence on which Tetronics relies in support of this substantial monetary claim is set out in Rumbol's first witness statement. [CWS69 ¶¶82-94; CPHB1 ¶¶345-350] In summary, Rumbol states:

    a. The global e-waste management market has been forecasted to achieve a compound annual growth rate of 23.5% during the period 2014 – 2020;

    b. The need to upgrade to the latest technologies leads to the generation of millions of tons of e-waste;

    c. The cost of replacing an electronic device is often less than the cost of getting it repaired, so there is a growing tendency to purchase a new product rather than repairing an existing one, resulting in additional e-waste;

    d. This is leading to increased activities for managing e-waste and Tetronics is ideally placed to benefit and exploit the growing e-waste market;

    e. Based on statistics and projections derived from a market publication Rumbol calculates that the anticipated market in 2020 for the sale of plasma plants such as those Tetronics produces is £280 million, which he determines as follows:

• 2020 projection of 49.4 million metric tons of WEEE (waste electrical and electronic equipment).
• Of the 49.4 million metric tonnes, only 14 million metric tonnes is expected to be collected for recycling.
• Of the 14 million tonnes of WEEE recycled, approx. 4% will be Printed Circuit Boards (**PCBs**) that could be fed into Tetronics' plasma processing plants. This equates to 560 thousand tonnes.
• This reduces to 280 thousand tonnes of PCB's if you assume only 50% are need-high grade PCBs that are best suited for processing through a plasma plant, for economic reasons.
• This equates to 80 plasma plants if you assume a plant size of 3.5ktpa.
• With a Plant cost of £3.5m, potential total Plant sale revenues would be £280 million for 2020.

f. Tetronics "aims to secure 30% market share over 10 years" equating to 24 plants at approximately £84 million; and

g. "The disclosure of Tetronics' intellectual property relating to the furnace it supplied to Blue0ak under the Contract to a competitor, or to any other non-confidential or public person or entity would result in a significant loss to Tetronics. This loss could be very high as it has the potential to be very damaging to our future business. Our expected a-waste market is £84 million over the next 10 years. We expect that this loss of Tetronics' confidential, proprietary intellectual property will cost us 25% of our targeted market share, or £21 million."

570. I find that this evidence is not a sufficient basis to award Tetronics the damages it claims, for a number of reasons. First, the evidence includes no discussion about the specific Confidential Information that was disclosed to Hatch (its nature, secrecy, novelty, importance, value, possible obsolescence etc.) or about how its disclosure to a competitor would impact Tetronics' market share. Second, there is no evidence of the disclosure of any Confidential Information to anyone other than Hatch, and no evidence about how disclosure to Hatch would lead to a 25% loss of Tetronics' market share. Third, the ultimate source of the data used to calculate the loss is an industry publication, but there is no expert evidence lending credence to that source or its methodologies or information sources. Fourth, there is no evidence about the reasonableness of Tetronics' target to obtain a 30% market share or the likelihood that it could be achieved. Fifth, there is no evidence or explanation to

justify the estimate that Tetronics might lose 25% of its market share. Sixth, the loss claimed appears to be a claim for lost gross sales revenue, without factoring in the cost of production, cost of sales or, indeed, any other costs. Seventh, the damages claim assumes, without explanation, that Hatch will breach the obligation it assumed under the NDA not to use or disclose any confidential information.

571. I find that the entire damages calculation is so rife with speculation as to be wholly unreliable for the purposes of assessing whether any damages actually were caused by the disclosure of very specific information. I find that Tetronics has failed to prove that it will suffer any financial loss as result of BlueOak Resources' breach of the License Agreement and that its claim for damages must be rejected for that reason.

572. Tetronics also seeks injunctive and declaratory relief. The claims for relief other than damages are discussed below.

(e) Summary of Conclusions Regarding Damages Payable to Tetronics

573. In summary, for the reasons I have stated, I find that:

a. Tetronics is entitled to an award of damages against BlueOak in the amount of £2,111,392 for breach of the Contract by wrongfully terminating the Contract;

b. Tetronics is entitled to an award of damages against BlueOak in the amount of £3,080,000 for breach of the Contract by wrongfully drawing on the HSBC Bond;

c. Tetronics' claim for an award of damages against BlueOak in the amount of £1,012,142 for costs incurred as a result of BlueOak's alleged fraud in relation to the required tapping temperature is rejected; and

d. Tetronics' claim for damages against BlueOak Resources for its breach of the License Agreement is rejected as Tetronics has failed to prove that the breach caused any loss.

(U) Tetronics' Claims for Pre-Award Interest

574. Clause 10.2 0f the Conditions to the Contract states:

10.2 If the Buyer fails to make payment of any amount due to the Seller within 5 days of the date for payment of that amount the Seller shall be entitled to receive interest on that amount at the rate of 5% per annum above the base rate of the Bank of England.

575. Tetronics claims pre-award interest on its claims for damages for wrongful termination (the three "lost" future milestone payments and the present value of royalty payments) at the rate of 5% per annum above the base rate of the Bank of England calculated from the dates when the SUT 1, SUT 2 and FAT milestones would have been achieved. [CPHB1 ¶377]

576. Tetronics claims pre-award interest on its other claims at the 9% statutory rate for New York set forth in N.Y. C.P.L.R. 5004 ("Interest shall be at the rate of nine per centum per annum, except where otherwise provided by statute"). BlueOak uses the same 9% interest rate when calculating interest on the damages it claims by way of counterclaim. BlueOak did not suggest that it was inappropriate to use that rate in respect of an award made in British pounds. On the damages for unlawfully drawing on the HSBC Bond, Tetronics claims pre-award interest calculated from the date BlueOak received the funds from HSBC. [CPHB1 ¶378]

577. Stout provided detailed interest calculations of interest in its First Report to 31 May 2019. The interest claimed on the future milestone and royalty payments to that date at the Contract rate was £126,011. This amount was not revised or updated in Stout's damages recalculation which was marked as Hearing Exhibit "A." No claim was stated for pre-award interest after 31 May 2019 and no award is made in that regard. [CXR20, Stout First Expert Report, Ex. E.1; Hearing Ex. "A" (**Damages Recalculation**) Ex. E.1]

578. Although it was not separately calculated, the interest claimed on the HSBC Bond amount from 30 April 2018 to 15 August 2019 can be derived from the information provided in the Damages Recalculation, by deducting the Bond amount from the total principle and interest claimed. Calculated at the statutory rate the amount claimed is (£3,457,799 (p+i) – £3,080,000 (p) =) £377,799. No claim was stated for pre-award interest after 15 August 2019 and no award is made in that regard.

579. BlueOak has not challenged Stout's calculations of interest.

580. For the reasons stated, I find that:

a. Tetronics is entitled to an award of £126,011, representing pre-award interest on the sum £2,111,392; and

b. Tetronics is entitled to an award of £377,799, representing pre-award interest on the sum of £3,080,000.

(V) Damages Claimed by BlueOak

581. BlueOak claims total damages of $12,164,932.74 (excluding interest), as follows: [RPHB1 ¶250; RPHB2 ¶133]

Payments Made under FEED & Supply Contract	$9,081,409.33
Unearned (Advance) payment for Second System	$751,173.00
Additional costs (spares etc.)	$2,129,976.84
Fees Paid to Engineering Consultants	$202,373.57
Total (excluding interest)	**$12,164,932.74**

582. The sum of $9,081,409.33 is claimed by BlueOak as damages for breach of contract, on the basis that Tetronics failed entirely to fulfill its obligations under the Contract, so that BlueOak should recover all of the funds it has paid to Tetronics. [RPHB1 ¶¶251-254] All of BlueOak's damages claims have been rejected.

583. The amount of the advance payment of $751,173 payment is being sought by BlueOak "not as a contractual damage, but 'because it was unearned and paid in advance' based on Tetronics' fraudulent representation." [RPHB1 ¶257] The $2,129,976.84 is said to represent tort damages for reimbursement of expenses that BlueOak incurred "for spare parts, utilities, supplies, and other non-legal fees directly resulting from Tetronics' decision to keep BlueOak "on the hook" for prolonged commissioning, even though it knew the System could not operate as designed." The $202,373.57 is claimed as tort damages for "engineering consultant fees rendered to Hatch during BlueOak's attempt to discover the truth about Tetronics' fatally-flawed System." [CPHB1 ¶¶255,256] As all of BlueOak's tort claims have been rejected, I find that BlueOak's claims for damages for these amounts are also rejected.

(W) Other Claims for Relief

(a) Additional Claims for Relief by Tetronics

584. In addition to its claims for monetary awards and for costs, Tetronics seeks awards as follows: [CPHB1 ¶382]

a. A permanent injunction enjoining future unauthorized disclosures by BlueOak and BlueOak Resources of Tetronics' confidential information in breach of the License Agreement and/or Variation Agreement 02 (**Tetronics' First Injunction Request**);

b. A declaratory judgment that the actions and breaches of BlueOak and BlueOak Resources result in forfeiture of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement (**Tetronics' First Declaration Request**);

c. A permanent injunction enjoining BlueOak and BlueOak Resources from the use or exercise of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement (**Tetronics' Second Injunction Request**);

d. A declaratory judgment that Tetronics is not and has not been for all relevant times in breach of the Contract, and that BlueOak's call on the bond was unjustified and a breach of the Contract (**Tetronics' Second Declaration Request**); and

e. A declaratory judgment that BlueOak's termination of the Contract was unjustified (**Tetronics' Third Declaration Request**).

(b) Tetronics' First Injunction Request

585. Tetronics' First Injunction Request is for injunctive relief arising from the disclosures of Confidential Information discussed earlier in this award, as a result of which I (i) rejected Tetronics' allegation of a breach of the Contract in this regard, but (ii) found that BlueOak Resources is liable under the License Agreement for BlueOak's disclosures to Hatch. Tetronics has not in its submissions included analysis specifically addressing the claim for injunctive relief. Apart from denying any breach, the Respondents, have not addressed the claim for injunctive relief.

586. Based on my findings, the relevant breach was a breach of the License Agreement, not the Contract. The disclosure was made by BlueOak, not by BlueOak Resources.

BlueOak Resources is liable because it assumed responsibility for BlueOak's disclosures, even though BlueOak itself is not liable. BlueOak, however, is not a party to the contract that was breached – the License Agreement. I find that Tetronics has not established any legal basis to enjoin BlueOak from breaching a contract to which it is not a party. I also find that as BlueOak Resources did not make the offending disclosure, Tetronics has not established that there is a factual basis to enjoin BlueOak Resources from further disclosures. For these reasons the request for an injunction is rejected. To be clear, this rejection in no way suggests that either Respondent is released by this award from any continuing confidentiality obligations.

587. For the reasons I have stated, Tetronics First Injunction Request is rejected.

(c) Tetronics' First Declaration Request and Second Injunction Request

588. As for Tetronics' First Declaration Request and Second Injunction Request, Tetronics has not in its submissions included analysis addressing the basis for the relief claimed. No argument has been made and no relief has been sought concerning whether or not the License Agreement continues in effect or has come to an end. No argument has been directed toward the question of what rights, if any, Respondents might have with respect to Patents, Know-How, and/or Intellectual Property Rights under the License Agreement. Despite this void, while both parties were invited in the Guidelines to identify claims that have been abandoned, Tetronics has not abandoned these requests.

589. As Tetronics has failed to identify a legal or factual basis for the relief sought, Tetronics' First Declaration Request and Second Injunction Request are rejected.

(d) Tetronics' Second and Third Declaration Requests

590. I find that Tetronics is entitled to the relief sought by its Second Declaration Request, slightly modified to reflect the findings I have made in relation to BlueOak's allegations that Tetronics materially breached the Contract and Tetronics' claim for wrongfully drawing on the HSBC Bond. For the reasons stated in this award I find that Tetronics is entitled to a declaration that Tetronics is not and has not been for all relevant times in material breach of the Contract, and that BlueOak's call on the HSBC Bond was unjustified and a breach of the Contract.

591. I also find that, for the reasons stated in this award, Tetronics is entitled to a declaration that BlueOak's termination of the Contract was unjustified, as requested by Tetronics' Third Declaration Request.

(e) Respondents Do Not Request Additional Relief

592. Respondents did not seek any relief in addition to their requests for monetary awards and costs.

(X) Costs

593. By the Costs Stipulation each party agrees to "cap" its request for legal fees at US$1 million, excluding "ICC costs (e.g., arbitrator fees and ICC administrative costs)." [CPHB1 ¶¶380,381; RPHB1 ¶265] The parties also agreed to give the Sole Arbitrator "full discretion" to determine whether (i) there is a single prevailing party, and if so, whether that party should be awarded the full US$1 million or some lesser amount, or (ii) whether each party has prevailed on different issues. To the extent the Sole Arbitrator determines that each party prevailed on different issues, the parties agree to give the Sole Arbitrator discretion to determine what amounts should be awarded to each party.

594. Article 38 of the ICC Rules states (in relevant part):

> Article 38: Decision as to the Costs of the Arbitration
>
> 1) The costs of the arbitration shall include the fees and expenses of the arbitrators and the ICC administrative expenses fixed by the Court, in accordance with the scale in force at the time of the commencement of the arbitration, as well as the fees and expenses of any experts appointed by the arbitral tribunal and the reasonable legal and other costs incurred by the parties for the arbitration.
> …
> 4) The final award shall fix the costs of the arbitration and decide which of the parties shall bear them or in what proportion they shall be borne by the parties.
>
> 5) In making decisions as to costs, the arbitral tribunal may take into account such circumstances as it considers relevant, including the extent to which each party has conducted the arbitration in an expeditious and cost-effective manner.

595. The ICC Court, at its session of 2 April 2020 fixed the costs of arbitration in respect of ICC administrative fees and arbitrator fees and expenses at USD $332,000.

596. Success has been divided in this case, but Tetronics has been substantially more successful than Respondents. Tetronics succeeded in recovering the damages awards it sought for BlueOak's breach of the Contract by wrongfully terminating the Contract (£2,111,392) and for wrongfully drawing on the HSBC Bond (£3,080,000). Tetronics was not successful, however, in its claim for costs incurred as a result of BlueOak's alleged fraud (£1,012,142). In respect of a £21 million claim for damages I have found that the damages claim must be rejected as Tetronics has failed to prove any loss. Claims for injunctive relief and one claim for declaratory relief have been rejected, while two other claims for declarations were granted.

597. Tetronics was obliged to defeat a series of allegations by BlueOak that Tetronics itself had breached the Contract. Many of the allegations were factually complex. While it has not been necessary to delve too deeply in this award into some of the many technical issues raised by BlueOak - concerning matters such as alleged defects in the off-gas system, characteristics of the furnace that allegedly caused the furnace to be unable to retain sufficient heat, alleged defects in the feed system etc. – these matters had to be addressed in detail in the evidence. The defences BlueOak raised, unsuccessfully, contributed substantially to the time and expense associated with this arbitration.

598. BlueOak did not succeed in recovering any part of the substantial damages it claimed (US$12,164,932.74). While Tetronics' £21 million claim for damages was rejected, and the importance of a claim of that magnitude should not be underestimated, the time and expense devoted to meeting that claim was limited.

599. In these circumstances I find that Tetronics should be entitled to recover a very substantial part of the US$1 million to which the parties have agreed, but that there should be a deduction that reflects both Tetronics' lack of success with its monetarily largest claim and the fact that despite its size that claim did not account for a significant amount of the time and expense associated with this case. I find that Respondents, jointly, should pay Tetronics US$850,000 on account of Tetronics' reasonable legal and other costs incurred for the arbitration.

600. The amounts fixed by the Court ICC Court for the fees and expenses of the Sole Arbitrator and the ICC administrative expenses take into account the total amount

claimed by Tetronics and the total amount claimed by BlueOak in its counterclaim. While Tetronics claims have been determined to be substantially over-stated in amount, BlueOak's monetary claims failed almost entirely. In these circumstances, I find that Respondents, jointly should reimburse Tetronics for 85% of the amount that Tetronics has paid to the ICC Court. This amounts to ($166,000 x 85% =) $141,100.

IX. AWARD

601. By email communications dated 17 April 2020 the parties agreed that, in the light of practical difficulties arising from COVID-19 restrictions, in lieu of the delivery of hard copies, this award may be notified to the parties by the Secretariat by email only pursuant to Article 35 of the ICC Rules.

602. For the reasons stated in this award, my final award is as follows:

a. BlueOak is ordered to pay to Tetronics the sum of £2,111,392 as damages for breaching the Contract by wrongfully terminating the Contract;

b. BlueOak is ordered to pay to Tetronics the sum of £3,080,000 as damages for breaching the Contract by wrongfully drawing on the HSBC Bond;

c. BlueOak is ordered to pay to Tetronics, as pre-award interest, the additional sums of
    i. £126,011, representing pre-award interest on the sum £2,111,392; and
    ii. £377,799, representing pre-award interest on the sum of £3,080,000;

d. Tetronics' claim against BlueOak Resources for damages for breach of the License Agreement arising out of BlueOak's disclosure of Confidential Information to Hatch is rejected;

e. Tetronics' claim for an award of damages against BlueOak in the amount of £1,012,142 for costs incurred as a result of BlueOak's alleged fraud in relation to the required tapping temperature is rejected;

f. I declare that Tetronics is not and has not been for all relevant times in material breach of the Contract, and that BlueOak's call on the HSBC Bond was unjustified and a breach of the Contract;

g. I declare that BlueOak's termination of the Contract was unjustified;

h. Tetronics' request for a permanent injunction enjoining future unauthorized disclosures by BlueOak and BlueOak Resources of Tetronics' confidential information in breach of the License Agreement and/or Variation Agreement 02 is rejected;

i. Tetronics' request for a declaratory judgment that the actions and breaches of BlueOak and BlueOak Resources result in forfeiture of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement is rejected;

j. Tetronics' request for a permanent injunction enjoining BlueOak and BlueOak Resources from the use or exercise of any right and/or license to use any Patents, Know-How, and/or Intellectual Property Rights, or any other right or license, under the terms of the License Agreement is rejected;

k. BlueOak's claims for an award ordering Tetronics to compensate BlueOak for damages equal to not less than USD$13,647,175.50 is rejected;

l. Specifically:

    i. BlueOak's claim for US$9,081,409.33 for payments rendered to Tetronics for the first furnace is rejected;
    ii. BlueOak's claim for US$751,173.00 for unearned payments rendered to Tetronics for the second furnace is rejected;
    iii. BlueOak's claim for US$2,129,976.84 for spare parts, utilities, supplies, and other non-legal fees directly caused by Tetronics' failure to commission the second furnace is rejected;
    iv. BlueOak's claim for US$202,373.57 for fees rendered to engineering consultants is rejected; and

v. BlueOak's claim for US$482,242.74 in pre-judgment interest on damages is rejected;

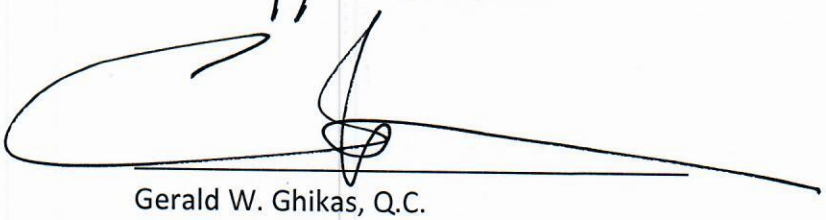
m. BlueOak and BlueOak Resources, jointly, are ordered to pay to Tetronics US$850,000 on account of Tetronics reasonable legal and other costs incurred for the arbitration;

n. BlueOak and BlueOak Resources, jointly, are ordered to pay to Tetronics the sum of US$141,100 to reimburse Tetronics for 85% of the amount that Tetronics has paid to the ICC Court in respect of the Sole Arbitrators fees and expenses and the ICC's administrative costs; and

o. All other claims and counterclaims of the parties are rejected.

Made at the Place of Arbitration: Paris, France

Dated the 17TH day of April 2020.



Gerald W. Ghikas, Q.C.
Sole Arbitrator