Neutral Citation Number: [2021] EWHC 579 (QB)

Case No: QB-2018-001043

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION

Royal Courts of Justice
Strand, London, WC2A 2LL

Date: Friday 12th March 2021

Before :

ROGER TER HAAR Q.C
(Sitting as a Deputy High Court Judge)

- -

Between :

BODYCOTE HEAT TREATMENTS LIMITED	**Claimant**
- and -	
VACUUM AND ATMOSPHERE SERVICES LIMITED	**Defendant**

- -
- -

JONATHAN WARD (instructed by **Eversheds Sutherland (International) LLP)**) for the **Claimant**
JONATHAN MITCHELL (instructed by **Kennedys LLP**) for the **Defendant**

Hearing dates: 24, 25 and 26 February 2021

- -

Approved Judgment

Covid-19 Protocol: This judgment will be handed down by the judge remotely by circulation to the parties' representatives by email and release to Bailii. The date and time for hand-down is deemed to be 10.30am on Friday 12th March 2021.

Roger ter Haar Q.C. :

1. The The Claimant ("Bodycote") is a provider of specialist thermal processing services. Much of Bodycote's work is carried out at its Derby facility for Rolls Royce.

2. The Defendant ("VAS") is a provider of maintenance services to the thermal processing industry.

3. The dispute before the Court concerns a catastrophic failure of one of Bodycote's furnaces, during operation, which caused damage to Bodycote's plant, and to components belonging to Rolls Royce.

4. The furnace in question consists of an external vessel, and a "hot zone", which is located within the vessel, and inside of which components are heated. VAS carried out the relining of the hot zone in April 2018 and then carried out further works to the hot zone in December 2018 and January 2019. As part of those works VAS transported the hot zone to its workshop, and then back to Bodycote's premises, where it reinstalled the hot zone into the furnace.

5. The incident leading to this claim took place on 5 July 2019. There is no dispute between the parties as to the immediate mechanism of damage. Within the furnace there were six gas deflection plates located above the hot zone. The function of these plates is to direct the flow of the inert gas which is pumped into the hot zone at high pressure during the cooling phase of a heat treatment operation. One of these gas deflection plates (which are not intended to be subjected to high temperatures) detached from its fixings and ended up directly on top of the hot zone, where it melted during the next heat treatment cycle.

6. The dispute is over the cause of the detachment of the gas deflection plate. Bodycote contends that the plate had been improperly secured by VAS during reinstallation. VAS's principal case is that Bodycote's own employees must have detached and failed to properly re-secure the gas deflection plate following reinstallation by VAS. Bodycote denies that its own employees disturbed the gas deflection plates following VAS's works. In closing submissions Mr Mitchell on behalf of VAS also put forward the possibility that the plate had come loose during the operation of the furnace between January and July 2019.

Contractual Provisions

7. The claim is brought for breach of contract, in negligence and under a contractual indemnity.

8. There is no dispute between the parties that the contractual relationship between the parties incorporated Bodycote's terms and conditions. Those terms, insofar as relevant, provided as follows:

> "the Services shall, on completion of their provision to the Buyer, comply with the agreed specification or, if none, with the Supplier's standard specification and with any description or demonstration and shall otherwise be the best of their kind provided in the trade and be to the Buyer's reasonable satisfaction" (clause 5(b)(i));

> "the Services shall be provided with the highest standards of care, skill and workmanship within the trade…" (clause 5(b)(ii));
>
> "the Services shall be provided in accordance with all applicable standards, regulations and/or legal requirements, all relevant European and British Standards, and best accepted industry practices" (clause 5(b)(iii));
>
> "The supplier shall indemnify the Buyer against any direct, indirect or consequential losses, damages, proceedings, liabilities, claims, costs and expenses (including legal expenses on a full indemnity basis) which may be suffered or incurred by the Buyer as a result of or arising out of or in connection with: (i) any Goods and/or Services failing to comply with any of the Supplier's Warranties; (ii) any Goods and/or Services being defective or failing to comply with any applicable laws or regulations; … (iv) any other breach of the Contract by the Supplier or any negligent act of the Supplier, its employees, agents or contractors… (v) any claim made against the Buyer in respect of any liability, loss, damage, cost or expense sustained by the Buyer's employees or agents by any customer or third party to the extent that such liability, loss, damage, cost or expense was caused by, relates to or arises from the Goods and/or the Services…" (clause 8).

9. It is pleaded in the alternative that it was an implied term of the Contract that VAS would carry out its work with reasonable care and skill. The said term was implied pursuant to section 13 of the Supply of Goods and Services Act 1982, and/or as being reasonably necessary to lend business efficacy to the Contract, and/or by reason of its being so obvious as to go without saying.

10. Given the acceptance by VAS of the incorporation of Bodycote's terms and conditions, it is not necessary to consider the case based upon the alleged implied term.

The furnace, the hot zone and the gas deflection plates

11. There are a number of photographs of the furnace, the hot zone and the gas deflection plates in the trial bundle.

12. A sequence between pages 155 and 163 of the trial bundle are useful in understanding these different elements of the equipment.

13. Page 155 is a view of a similar furnace to the one with which I am concerned (the photograph shows furnace V3, but I am concerned with furnace V5). In this photograph the front door is closed.

14. The next photograph (156) shows the furnace with the front door open. The square box structure in the centre of the furnace is the hot zone, seen from the front with blanking plates in place to each side and below the hot zone. Above the hot zone the blanking plate has been removed revealing a space which it is agreed is from the top of the hot zone itself to the top of the furnace about 14 inches. Within that top space can be seen

graphite blocks and electrical buzz bars. (A closer view of this space on one of the furnaces is at pages 188, 192 and 193).

15. The next photograph (157) shows the hot zone taken out of the furnace. At the outer side visible to the camera can be seen amongst other features a metal footplate running from front to back.

16. The next photograph (158) shows the top of a hot zone. The front is at the bottom of the photograph. A little way up (as shown in the photograph) or in from the front (when in situ) are two hinges to a metal flap (known as a bung) which covers most of the top surface of the hot zone.

17. Towards the back of the bung can be seen a hook welded onto the bung. This is there to connect to a pneumatic lifting device which opens the bung to allow inert gas to enter in order to cool the furnace.

18. On photograph 158 there are chains to be seen, but these are irrelevant for present purposes (they are there to lift the hot zone when out of the furnace).

19. Behind the bung are six gas deflection plates. In photograph 158 these plates are correctly positioned. If numbered from left to right (as seen in this photograph, and as viewed from the front of the hot zone) 1 to 6, plates 1 and 6 have holes in the centre, and there is a third hole between plates 3 and 4 (half in plate 3 and half in plate 4). The plates can be seen in somewhat closer detail in photograph 159 and, from a different angle, in photograph 163.

20. Each of the plates is fixed at the front and rear ends.

21. Photographs at pages 191 and 194 show the interior of a hot zone. At the top of the hot zone the top elements are marked as "top heating". The top elements run from front to back in three sets of two elements. Each set of two elements runs into a connector block at the rear of the hot zone. In these photographs each connector block is attached by one hanger, but in the hot zone in furnace V5 at the time of the incident the rear connector blocks were attached by two hangers.

22. Those hangers went through the top or roof of the hot zone and emerged underneath the gas deflection plates where they were held in place. The fixing of the right hand hangers (as viewed from the front) on furnace V5 can be seen in the photograph on page 213 in the centre of the area previously covered by plate 6.

23. The photograph on page 213 was taken after the damage done on 5 July 2019. It is taken from the rear of the hot zone, so plate 1 is on the right. Plate 6 is missing. Plate 5 has a hole in it, so should properly be in the location where plate 6 was (compare with the photograph on page 158). My understanding is that the photograph on page 217 shows that wrongly positioned plate relocated to be plate 6, showing that it fits neatly in that location.

24. It is important to note that what are in this photograph plates 4 and 5 overlap.

25. Close examination of the photograph at page 213 shows that in respect of the bolts fixing the plates, some have hexagonal heads whilst others have cap heads. Hexagonal

heads are larger than cap heads and therefore apply more secure fixing of the plates. There is also at least one missing washer.

The Cause of the Damage

26. At one level the cause of the damage to the hot zone and its contents is simple: gas deflection plate 6 became loose and moved to the grill on top of the hot zone where it should not have gone.

27. The question is why the plate became loose. There appear to be three possible causes:

    i) The plate was attached incorrectly;

    ii) Failure to use correct bolts and/or washers when attaching the plate;

    iii) The plate came loose for some other reason in use between January and July 2019.

28. I include the third of these possible causes because in the course of his closing submissions in answer to some questions from me in respect of the application of the principle of *"res ipsa loquitur"*, Mr Mitchell raised the possibility that the plate simply came loose because of movements of the plate during the repeated use of the hot zone in that period.

29. I do not think that case is open to him procedurally since it was not pleaded by either party.

30. Nor do I believe it is open to him evidentially: there is no independent expert evidence in this case and none of the experienced witnesses called by the two parties suggested that this was a possible cause of problems.

31. The case was pleaded and opened before me, and the evidence was explored, upon the basis either that VAS left the plate and/or the bolts etc. in an unsatisfactory condition or that Bodycote interfered with the plate or its fixings after VAS had left the hot zone in situ. That approach appears to me to have been realistic: it is obvious that the furnace and the hot zone are designed to operate so that in ordinary operation the plates could not come loose and fall into the hot zone. There was no evidence to suggest any defect in the design. If the design was such that in ordinary use the plate might come loose and fall in, that would be a serious design fault. I have no basis for concluding that that is even a possibility.

32. Accordingly, I reject this suggestion.

33. That leaves me with possible causes (1) or (2) or both causes (1) and (2).

34. I have no real basis upon which to decide the causative effect or relative potency of cause (1) or (2) or both operating together.

35. To that extent I accept Bodycote's case that subject to a vital qualification this is a case of *res ipsa loquitur*. The vital qualification is the need to exclude the possibility that Bodycote's own workforce did something to weaken the attachment of the plate. If that possibility can be excluded, then for reasons which I expand upon below it seems to me

that the coming loose of the plate must have been caused by VAS's breach of contract. If that possibility cannot be excluded, then I cannot conclude on the balance of probabilities that the problem flowed from anything which VAS did or omitted to do.

36. This requires a close examination of the evidence to assess who did what to the plates.

Who did what and when to the plates?

37. The evidence reveals a long relationship between the parties. One of VAS's witnesses, Mr Oldham, told me of having had experience of carrying out works to Bodycote's furnaces for twenty years.

38. In or around 2017 or early 2018 Mr Raynor, Bodycote's Engineering and Health and Safety Manager, invited VAS to submit a quotation for the relining of the hot zone contained in the V4 furnace at Bodycote's Derby premises, which was a Schmetz Single Crystal furnace. Mr Raynor designed the reline procedure against which VAS was asked to quote.

39. VAS carried out the relining of the Bodycote furnace hot zone as evidenced by a delivery note dated 20 March 2018.

40. Approximately 2 months after that work was undertaken by VAS, it was discovered that the front beam on the hot zone which was at that time installed in furnace V4 at the Derby site had become distorted.

41. Mr Raynor says in his witness statement that in the normal course of events he would not expect any major problems to occur with a hot zone so soon after installation and the distortion suggested to him that there was an issue with the installation of the front beam by VAS.

42. Mr Raynor contacted VAS to discuss rectifying the issues with the hot zone in the V4 furnace and it was agreed with VAS that it would carry out rectification and improvement works.

43. On 13 December 2018 there was a meeting between Mr Long and Mr Oldham of VAS and Mr Raynor and Mr Bridgewater of Bodycote (a third employee of Bodycote, Mr Booth, phoned in). At this meeting there was discussion of VF 12 - the notes of that meeting record (bold type is in the original)[1]:

> "**VF12 poor quality**
>
> "Snagging being addressed on the 17th December.
>
> "Before we start a project VAS to visit site and [highlight] any issues before the project with site team.
>
> "Mike Oldham to be responsible.
>
> "Mike Oldham we will hold you responsible in future on all projects.

[1] TB 231

"**That level of crap cannot happen again**.

"We think a hose was damaged by a VAS engineer and the engineer argued that it was not his fault.

"Consideration should be made in future for small damage and not arguing the point damaging customer reputation."

44. The discussion extended to what was referred to as the "Derby spare hotzone". It was this hot zone which ended up in furnace V5. The notes record:

"Expected delivery.

"Let me know by the end of week, probably end of January.

"ML Agreed to upgrade front and rear top block hanger design FOC.

"Check list for VAS to ensure hot zone is 100% before it leaves, MO.

"Check list for Derby to ensure furnace is in good condition before hotzone swap commences DB, MO."

45. Thus as an exercise in customer relations VAS agreed to carry out free upgrading works to the spare hot zone. As I have pointed out above, the original design of the hot zones provided one hanger to each of the rear connecting blocks shown marked on the photographs on pages 191 and 194. VAS now agreed to install two hangers per block.

46. To carry out that work it was necessary for VAS to take off the gas deflection plates and replace them.

47. If the procedure agreed at the 13 December meeting was followed:

i) Mr Oldham ("MO" in the notes) would create a check list to ensure the hot zone was 100% before it left VAS's premises;

ii) Mr Bridgewater ("DB" in the notes) and Mr Oldham would create a check list for Derby to ensure that the furnace was in good condition before the hot zone swap (i.e. installation of the spare hot zone) commenced.

48. On the evidence before me it seems that neither check list was created.

49. The notes for the 13 December meeting ended with a list of "outstanding projects" which included "Derby V5 hotzone swap" which was to take place over three days starting on 28 January 2019.

50. I have no evidence from anyone who carried out works to what I will call the V5 hot zone at VAS's premises.

51. Whilst the 13 December notes suggest to me that it was agreed that a check of the V5 hot zone would be carried out before it left VAS's premises, I have seen no evidence to suggest that this was done – the defects discovered when the hot zone was at Bodycote's

premises suggest that if there was any such check done, it was not as thorough as might be desired.

52. The trial bundle includes a VAS Service report for the week ending 2 February 2019.[2] This shows VAS personnel at Bodycote's Derby premises on Monday to Friday that week.

53. On Monday 28 January 2019 there were three VAS personnel present: Chris Chambers ("CC"), Dominic Gayle ("DG") and Mr Day ("MD").

54. On Tuesday 29 January and Wednesday 30 January 2019 those three were joined by Mr Oldham.

55. On Thursday 31 January those four were joined by Mr James Long. On that day times are recorded for each participant's time on site (in the case of Messrs Chambers, Day, Oldham and Long they were there until the morning of the following day, the Friday):

    Mr Chambers: 07.30 to 03.00

    Mr Gayle: 07.30 to 18.30

    Mr Day: 07.30 to 03.00

    Mr Oldham: 12.00 to 05.30

    Mr Long: 19.00 to 01.00

56. On Friday 1 February 2019, only Mr Chambers is recorded as being present – thus the hours between midnight on 31 January and 05.30 on 1 February are treated as being part of the Thursday (31 January).

57. I heard evidence from Mr Chambers and Mr Oldham that when the V5 hot zone arrived at Bodycote's premises, it slid off its blocks which caused damage.

58. As Mr Oldham told me in his oral evidence (correcting his witness statement at paragraph 20) that he inspected the V5 hot zone on 29 and 30 January 2019.

59. Mr Oldham took a number of photographs of what he called "issues" with the V5 hot zone. I have been given agreed metadata which show me the date and times of the photographs taken: those at pages 196, 197, 199, 200, 207 and 212 were all taken on 29 January; those at pages 150, 198, 201, 208, 209 and 210 on 30 January. All had been taken by 10.16 on the morning of 30 January except that at page 208, which was taken at 15.24 on 30 January.

60. Of these still photographs, taken on Mr Oldham's mobile phone, the most important is that at page 150.

61. The trial bundle before me is in electronic format which enables me to expand the image so as to significantly magnify parts of the photograph. It seems to me tolerably clear when viewing the photograph in very expanded form that between plates 4 and 5 there

[2] TB 256

is a clear gap. This is to be contrasted with the photograph at page 213 taken after the incident: in the latter photograph, there seems to me to be a clear overlap between plates 4 and 5. The photograph at page 150 was taken on 30 January at 09.04.

62. The comparison of these photographs appears to me to show that between 09.04 on 30 January and 5 July someone had interfered with the plates in locations 4 and 5 so that the gap visible in the earlier photograph had disappeared and the plates which previously had not overlapped now did overlap.

63. VAS also relied heavily on a video taken by Mr Oldham about 5 minutes after the photograph on page 150 and upon a still from that video. I have viewed the video and have also looked with care at the still. I find it difficult to reach any clear conclusions as to the state of the gas deflection plates from either the still or the video, but that may not matter given the conclusion which I have derived from photograph 150.

64. The photographs taken by Mr Oldham were taken by him to record "issues" with, i.e. defects in, the V5 hot zone as delivered to Bodycote's premises.

65. Whilst he was not following any check list as had been anticipated that he would do at the 13 December 2018 meeting, he took photographs of the defects he found and used a function on his phone to write a note as to the defects which he was recording – see pages195, 197, 199, and 200.

66. There were also defects which he found which were not the subject of any written note on a photograph, most importantly that at least one stainless steel washer had been used inside the hot zone, which, it was accepted, was a "fundamental" error.

67. It was Mr Oldham's evidence that he checked every single component on the hot zone, which he said would have taken him about an hour. He said that he checked the fixture of the gas deflection plates, but he did not lift them to inspect beneath them. He said he checked them by giving each of them a "wiggle" to check that they were securely in place.

68. One of the problems which he had noticed on one of the side fixings of the hangers is shown on the photograph on page 200. This shows where the fixing for a side hanger protruded through the side wall – this was equivalent to the situation that would have been found if the hangers at the top of the hot zone underneath the gas deflection plates had been inspected. At this side location it was recorded by Mr Oldham that "retaining wires inadequately bent". If the retaining wires were inadequately bent at the sides, it was obviously possible that they might be inadequately bent at the top under the gas deflection plates.

69. However, on Mr Oldham's evidence, he saw no reason to check himself or ask anyone on his team to check whether the side wall defect was replicated on the top. He was adamant that nobody would have taken off the gas deflection plates to check these fixings.

70. Mr Oldham did not himself resolve the "issues" which he discovered, but left this to his colleagues.

71. The only one of those colleagues who gave evidence was Mr Chambers. He was a very open witness who confirmed that on the shift starting on the morning of 31 January he worked a 17 hour shift. He accepted that because he worked such a long shift he might have missed some defects, although his recollection was that he did not work on the gas deflection plates after the photograph at page 150 was taken on 30 January.

72. After the incident on 5 July, a meeting took place between representatives of Bodycote and VAS to discuss what had happened. In the note of that meeting in the trial bundle it is recorded first[3]:

> "Position of plates did not matter as long as were attached now hanger design changed"

And then, at the end of the notes[4]:

> "ML stated Bodycote traditionally only cared about what was internal in a hot zone and not external …."

73. It seems to me that this accurately recorded what was likely to have been VAS's attitude: namely that great care was taken to examine components which were inside the hot zone or which were connected with the hot zone, and less care was taken with inspection of items outside the hot zone.

74. This made a great deal of sense. Within the hot zone itself very high temperatures were being generated and therefore extreme care was necessary.

75. On the other hand, the gas deflection plates were there to be used in the process of cooling down the hot zone, and were exterior to the hot zone. The suggestion that the position of the gas deflection plates did not matter appears to me to have been a realistic assessment of the risks as perceived by VAS at the time of reinstallation.

76. Further, given that concerns had been expressed by Mr Oldham about fixings at the side of the hot zone, it would have been a surprising omission if the equivalent fixings under the gas deflection plates were not checked, given that a failure of the hangers could have serious consequences inside the hot zone.

77. Thus it seems to me perfectly possible, and indeed probable, that the gas deflection plates were lifted and replaced after the photograph and video were taken on the morning of 30 December.

78. It also seems to me, for the reasons which I set out below, unlikely that Bodycote's engineers would have replaced whatever bolts and washers were in situ when VAS left site with the assortment of inappropriate bolts which were in place when the incident happened.

79. In my judgment, Mr Oldham and Mr Chambers were honest witnesses doing their best to recollect what happened when they were on site. I have no doubt that Mr Oldham in particular checked those elements which he then regarded as being particularly

[3] At TB 304
[4] At TB 305

important. However I do not accept that he inspected the gas deflection plates in their final configuration with the care which he now believes he did.

80. I reach that conclusion based primarily upon the evidence as to what happened in the last week of January 2019, but my conclusion is reinforced by consideration of whether it is likely that Bodycote's engineers took off the gas deflection plates or may have taken off the deflection plates between January and July 2019.

81. VAS's strongest point, as it seems to me, is that on 3 July 2019 Bodycote engineers carried out works to furnace V5 – it submits that an obvious inference is to be drawn from the proximity of those works to the incident. In paragraph 4 of his written opening submissions, Mr Mitchell submits as follows:

> "VAS submit that it is too much of a coincidence that the gas deflection plate came off immediately after Bodycote had done work on 3rd July 2019 when prior to then it had been secure and the furnace had run 235 cycles since January 2019… Given that Bodycote have failed to call the men who actually worked on the furnace between January and July 2019 and, in particular, on 3rd July 2019 when they are available to give evidence, the court should reject Bodycote's assertion that the men have said that they did not interfere with the gas deflection plates: *Dawkins v Carnival plc* [2011] EWCA Civ 1237 *per* Pill LJ at paras. 21 & 28."

82. In Mr Oldham's witness statement (at paragraph 45) he says:

> "It is also apparent from the documents provided by Bodycote that between the reinstallation of the furnace in January 2019 and the incident which happened on 5 July 2019 that the hot zone has been worked on, on numerous occasions by Bodycote, who did undertake some of the maintenance on the hot zone themselves."

83. He then continues at paragraph 46 to identify what in his view were the significant occasions (other than on 3 July 2019) on which Bodycote worked on the V5 hot zone:

> "The hot zone in question was worked on, as follows"
>
> "(a) **138730 – 06/03/19** – the work is an insurance requirement. I believe the hot zone would have to have been removed to inspect the welds and the wall thickness. The gas deflection plates would have been visible during these works and issues (if there were any) would have been easily identifiable and should have been rectified.
>
> "(b) **143282 – 28/05/19** – if this work related to the rear top heating, then Bodycote would have had to either removed the hot zone or repair it in situ. Either way a confined space permit would have been required. I have seen no corresponding permit in Bodycote's documentation. The gas deflection plates would have been visible during these works and issues (if there were any) would have been easily identifiable and should have been rectified.

"(c) **143689 & 142818 – 07/06/19** – I believe these works would have been undertaken whilst the hot zone was out of the furnace. The gas deflection plates would have been visible during these works and issues (if there were any) would have been easily identifiable and should have been rectified.

"(d) **143989 – 14/06/19** - The gas deflection plates would have been visible during these works and issues (if there were any) would have been easily identifiable and should have been rectified."

84. At paragraphs 47 to 52 he then discusses the work done on 3 July 2019:

"47. However, the most crucial work instruction relates to works instruction number 144712 dated 3 July 2019, only 2 days before the incident. A copy of the works order is attached at exhibit "MO6"."

"48. That works order records the following as the description

"Whole of top zone load thermocouples going over temp, furnace did not trip in cabinet but alarm load over temp showing on stage"

"49. The completion comments say the following

"After further inspection we found a couple of issues with the furnace. One was the element hanger pins had broken on the side heating and one of the elements on the top heating had arced. We replaced these and found that the heating breaker would not stay engaged due to a faulty under voltage relay. We changed this component and ran the furnace on a ballast trial."

"50. The repairs could have been undertaken whilst the hot zone was in situ, this would have been a very awkward job but considerably less time consuming than removing the hot zone. To undertake these repairs the gas deflection plates would most likely have been removed, particularly if the top graphite connector block support pins were damaged, during the failure in this area or during the maintenance work carried out in this area. (This is very likely as moly becomes extremely brittle once heated). On the image attached at **"MO7"** I have circled the fixing points that would need to be accessed. These fixing points are situated below the gas deflection plate and are only visible because the gas deflection plate is missing.

"51. If there was any doubt that Bodycote had been working in this area of the hot zone, this is clarified by the email sent by Gary Starr to David Booth and Chris Raynor in which he describes the incident. In that email he says (**"MO8"**)

"We need to bear in mind that our staff have been working on this furnaces over the last few days – this was the first productions run."

> "52. It is clear to me that there was a fault with the furnace which was identified on 3 July 2019. To repair this fault. regardless of whether or not the hot zone was removed from the furnace, the gas deflection plates would have most likely have been removed to access the required fixings, particularly if the top graphite connector block support pins were damaged. Once the fault was repaired the gas deflection plates would have been re-fixed in place, before a trial run was undertaken using ballast (scrap material). It should be considered the deflector plate was not re-fitted in the correct place and was left loose on top of the hot zone."

85. Of course, Mr Oldham was and is only able to comment upon whatever information was and is available to him. Accordingly this is in the nature of opinion evidence, but in the absence of any independent expert evidence I have no difficulty in admitting it and considering it.

86. For Bodycote I had evidence from Mr Bridgewater to whom I have already referred. In his witness statement at paragraphs 10 to 14 he says this:

> "**Access to gas deflection plates and day to day maintenance**
>
> "10. On the basis of my experience, I consider it necessary to remove the hot zone in order to gain access to the gas deflection plates. It would not be possible for an engineer to access the gas deflection plates from climbing to the back hot zone whilst installed in the furnace.
>
> "11. In addition, given that the hot zone was reinstalled into the V5 furnace only some 6 months before the failure of the hot zone, if an engineer felt that there was an issue which required access to the gas deflection plates or if it was felt any major work needed to be carried out on the hot zone for the repair, we would have simply contacted VAS to rectify the issue. As I recall, VAS was carrying out quite a lot of work for Bodycote at the time and they were very responsive to correcting any issues so it would have been a very straightforward matter for the Bodycote engineers to contact VAS had they noticed such an issue.
>
> "12. I have reviewed the witness statement of my colleague Chris Raynor and in particular paragraph 33 in respect of the maintenance work undertaken by Bodycote engineers and the supported document referenced in the table provided in Chris' statement. Having reviewed these documents it is my view that:
>
> "12.1 none of the work undertaken by Bodycote engineers would have required access to the gas deflection plates.
>
> "12.2 none of the work undertaken by the Bodycote engineers required removal of the hot zone (which I feel needs to happen before the gas deflection plates can be accessed). I should also mention that removal of a hot zone is not an easy task and requires the furnace to be disconnected for the duration. If an engineer was very experienced in removal of hot zones, this is potentially a task which can be

> complete in a day (with multiple engineers working on this) but generally I would consider this to be a minimum 2 day job.
>
> "13. I have also spoken with the 2 of the site engineers at Derby who would normally be responsible for maintaining the Derby site and they have all confirmed that they did not access or detach the gas deflection plates since the hot zone was installed into the V5 furnace by VAS. I did not speak with the third engineer who normally works at Derby (although I understand my colleagues Gary Starr and Christopher Raynor have) as he had left the Bodycote business at the time I was having these conversations.
>
> **"Conclusion**
>
> "14. On the basis of the above it is my view that:
>
> > "14.1 Bodycote engineers did not access the gas deflection plates between installation of the hot zone into the V5 furnace and failure of the hot zone; and
> >
> > "14.2 the failure of the hot zone, only some 6 months after its installation by VAS into the V5 furnace, is the result of poor workmanship by VAS."

87. I also had evidence from Dr Starr, who is Bodycote's Works Manager and who is a metallurgist. He says at paragraphs 32 to 39 of his witness statement:

> "**Work undertaken by Bodycote**
>
> "32. Between the installation of the hot zone into furnace V5 (covered by confined space permit number 3369 at page 14) and the failure of the same hot zone, Bodycote did undertake routine maintenance on the V5 furnace and hot zone. I have reviewed the witness statement of my colleague, Christopher Raynor, especially the table at paragraph 33 of Chris' statement and the documents referenced therein in respect of Bodycote maintenance work and my conclusions are set out below.
>
> "33. Having reviewed the confined space permits and any additional information in respect of the work undertaken (where this information was available), I conclude that:
>
> > "33.1 the hot zone in the V5 furnace was not removed between installation by VAS and the date on which the hot zone failed; and
> >
> > "33.2 none of the work listed would have required contact with or access to the gas deflection plates.
>
> "34. I also note that work of the type recorded in confined space permit number 4060 (page 24) and the downtime repair report for March 2019 (page 25) which was a "back element hanger bar repair" would not have required the gas deflector plates to be removed at all. I attach at page 26 a picture of the back of a hot zone identical to that in the V5 furnace and

> at page 27 a close up of the elements at the back of the hot zone. These elements can be accessed without any need to disturb the gas deflection plates, which sit on top of the hot zone. In fact, in my opinion based on my experience, a hanger bar should have lasted more than a couple of months anyway and the fact we needed to carry out internal work on this in March 2019 further shows the poor workmanship of VAS.
>
> "35. Given the structure of the furnace and hot zone and the placement of the gas deflection plates (as described at paragraphs 6 to 11 above), although it is theoretically possible that someone could squeeze into the very small gap to reach the gas deflection plates at the back of the hot zone, this does not seem to me to be probable as the gap is very small and there seems to me to be no good reason why any engineer would choose the access the gas deflection plates in such a manner.
>
> "36. None of the work detailed above required removal of the hot zone, so there would be no way the gas deflection plates could be easily accessed during any of the routine maintenance undertaken.
>
> "37. It is also my view that, as can be seen from the photographs at pages 4 and 5, metal splatter collects on the gas deflection plates during normal operation, so it would become increasingly difficult to detach the gas deflection plates as the furnace operated and metal splatter collected on the surface.
>
> "38. I have also spoken to the 3 engineer based in Derby who are responsible for the day to day maintenance of the Derby furnaces and they also confirmed to me that they had no contact with the gas deflection plates and certainly did not detach them in the course of any of the work undertaken on the V5 furnace between installation of the hot zone by VAS and the failure of the same.
>
> "39. I am therefore confident, on the basis of the above, that none of Bodycote's internal work involved detaching the gas deflection plates on the hot zone of the V5 furnace."

88. As the extract from Mr Mitchell's skeleton argument set out above shows, Mr Mitchells vigorously submits that there is a hole in Bodycote's evidence in that it has not called the various engineers who worked on the furnace in the period from January to July 2019, and in doing so relies upon dicta of Pill LJ in *Dawkins v Carnival PLC* [2011] EWCA Civ 1237.

89. I do not regard Pill LJ in that case as doing any more than commenting upon the absence of evidence in the specific factual context of the case then before the Court of Appeal. In my judgment, he was not laying down any general principle which I am bound to follow in this case.

90. What Bodycote had to do was to prove a negative: namely that its engineers had not worked on the gas deflection plates in the relevant period. In commenting upon that issue both Mr Bridgewater and Dr Starr were to a significant degree giving opinion evidence. Given that Mr Oldham was doing the same it would be wrong to rule out

Bodycote's witnesses doing so. Of course, the hearsay evidence given by Mr Bridgewater in paragraph 13 of his witness statement and by Dr Starr in paragraph 38 of his statement could have been given by such of Bodycote's engineers as were still with that company. However, similar criticisms could be made of VAS who did not call Mr James Long who worked on the furnace on 31 January, 5 and 7 February 2019 or Mr Gayle and Mr Day who were present on site at Derby for periods when Mr Oldham was not present, but nevertheless Mr Oldham commented upon what each of these gentlemen might or might not have done.

91. I do not regard the course each of the parties took as being unreasonable: what I must do is to assess the evidence submitted by each party. I have already done that in respect of the evidence from VAS as to the work done by its team in January 2019. I now do the same in respect of what Bodycote did or did not do between January and July 2019.

92. Before doing so, I should address criticism made of the quality of Dr Starr's evidence. It is true that he was somewhat defensive in giving evidence, but this was perfectly understandable given the awkwardness of giving evidence remotely. The same was true, in my judgment, of Mr Oldham. In neither case did I detect anything to make me think that the witnesses were doing anything other than doing their best to assist the court in their own particular ways.

Work Order 138730

93. This is mentioned by Mr Oldham in paragraph 46(a) of his witness statement.

94. It was Mr Oldham's belief that the hot zone would have had to be removed giving an opportunity for the gas deflection plates to be seen. It was not suggested that Bodycote did any work to the gas deflection plates on this occasion.

95. During the course of the trial VAS accepted that the hot zone was not removed on this occasion.

Work Order 143282

96. This is mentioned in paragraph 46(b) of Mr Oldham's witness statement.

97. Mr Oldham suggests in his witness statement that the hot zone might have been removed on this occasion. However by reference to the times shown on this occasion on the Word Order[5] the necessary works were completed in 3 hours. There is no possibility that the hot zone could have been removed and replaced in that time. I reject any suggestion that the hot zone was removed on this occasion, and the suggestion as not pursued at the close of the hearing.

98. Mr Oldham does not suggest that there is evidence of any work to the gas deflection plates. In cross-examination Mr Oldham accepted that there was no evidence that the work was not to the front of the hot zone (as was the suggestion of Dr Starr).

99. In my view any suggestion that works were carried out to the gas deflection blocks at this stage should be rejected.

[5] TB 419

Work Orders 143689 and 142818

100. These are mentioned in paragraph 46(c) of Mr Oldham's witness statement.

101. It is now accepted that work order 142818 is irrelevant. This relates to work done after the 5 July incident.

102. As to Work Order 143689[6], Mr Oldham thought the works would have been carried out whilst the hot zone was out of the furnace. On this occasion the time taken to carry out the works was 6 hours, which was, again, inadequate to take out the hot zone and to replace it.

103. In any event, Mr Oldham's suggestion in his witness statement is not that works to the gas deflection plates were carried out on that occasion, but only that the *"gas deflection plates would have been visible during these works and issues (if there were any) would have been rectified"*. Thus there is no basis for finding that any works to the gas deflection plates were carried out on this occasion.

104. I also reject the suggestion that there would have been any particular reason for Bodycote's engineers to inspect the gas deflection plates and its fixings on this occasion.

Works Order 143989

105. This is mentioned in paragraph 46(d) of Mr Oldham's witness statement.

106. Again, it is not Mr Oldham's suggestion that the hot zone was removed on this occasion, merely that *"the gas deflection plates would have been visible during these works and issues (if there were any) would have been easily identifiable and should have been rectified."*

107. Once again I reject the suggestion that there would have been any particular reason for Bodycote's engineers to inspect the gas deflection plates and its fixings on this occasion.

The Works on 3 July 2019

108. Thus the focus of VAS's case is, understandably, on the works carried out by Bodycote on almost the eve of the 5 July incident.

109. The important question is whether on this occasion Bodycote's engineers carried out any works to gas deflection plates.

110. In my judgment there is no basis upon which to conclude that the hot zone was removed on this occasion. Firstly, if it had been, I have no doubt that this would have been recorded in the comments box on the Works Order[7], which Mr Oldham sets out at paragraph 49 of his witness statement (see paragraph 84 above).

[6] TB 415
[7] TB 409

111. Secondly, the time taken to do the work on 3 July 2019 (about 6 hours) is, on the evidence which I have heard, inadequate to remove and reinstall the hot zone.

112. Thirdly, it seems to me likely that if Bodycote had wanted the hot zone removed, it is more likely than not that it would have got VAS to come and do it for them.

113. Thus, if works were done to the gas deflection plates on 3 July 2019, it would have been with the hot zone in situ within furnace V5.

114. It is Mr Oldham's suggestion that to carry out the necessary works referred to in the Works Order *"the gas deflection plates would have most likely ... been removed to access the required fixings, particularly if the top graphite block support pins were damaged"*[8]. The first problem with this hypothesis is that there is no evidence that the top graphite support pins were damaged.

115. An attempt to support the suggestion that the top graphite support pins (or one of them) were replaced was made by reference to the photograph at page 213: the suggestion was that there appeared to be a difference in colour between the fixings, suggestive of a recent change.

116. I did not find this convincing, particularly when there was no other contemporaneous evidence to suggest that the fixing had been changed.

117. There is a dispute between the parties as to whether it would have been possible for Bodycote's engineers to remove the gas deflection plates and work on the hangers with the hot zone in situ.

118. In my judgment, if it was possible (as to which I have considerable doubts) to do so, it would have been a very awkward exercise. The engineer would have had to wriggle on top of the hot zone in a space which was about 14 inches from top to bottom, but less than that if allowance is made for the graphite blocks on top of the hot zone being left in place.

119. Between the front of the hot zone and the back was the lifting mechanism for the bung which would be an obstacle, even if not an absolutely insurmountable or unavoidable obstacle.

120. Having got his hands and arms to the gas deflection plates, the engineer would then have to loosen the bolts holding down at least plate 6, and probably plate 5 as well. That done, on VAS's hypothesis, he would then change the fixings to the top graphite connector block support pins, which would be a fiddly job requiring wire to be threaded through the fixings. He would then have to replace the gas deflection plates.

121. In this way the fact that plates 4 and 5 were found to overlap after the incident could be explained, but not the fact (for example) that a washer was missing where it should have been at the far end of the row of plates from where the engineer was on this hypothesis working.

122. In my judgment, even if these steps were possible, they are not tasks which any ordinary engineer would attempt unless it was essential to do so. It seems to me almost inevitable

[8] Paragraph 52 of his witness statement

that if any engineer had carried out such manoeuvres he would have been keen to ensure that his devotion to duty was recorded in the comments on the Works Order.

123. Moreover, it seems to me highly improbable that any of Bodycote's engineers had done so because he would only have done so as a result of some overpowering necessity to do so. However, the evidence of Bodycote's witnesses, which I accept, is that the works covered by the relevant Works Order did not require any works to be done to or in the vicinity of the gas deflection plates.

124. For these reasons I reject the suggestion that Bodycote was responsible for any deficiency in the fixing of the gas deflection plates. I fully understand why the proximity of the works on 3 July and the incident of 5 July has caused questions to be raised, but close examination of the evidence persuades me that this was indeed a coincidence.

125. If it was not Bodycote who left the plate inadequately fixed, the only other candidate was VAS, most probably at a point in January 2019 after the photograph and video were taken.

Conclusions on Liability

126. Upon these findings, I do not understand VAS to contest that it was in breach of contract and/or negligent and that Bodycote is entitled to an indemnity under Clause 8 of Bodycote's terms and conditions.

Quantum

127. The loss and damage claimed by Bodycote is pleaded at paragraph 17 of the Particulars of Claim.

128. The item for value of lost sales pleaded at sub-paragraph (i) is no longer pursued. The abandonment of this item drew some fierce criticism from Mr Mitchell for the fact that it had ever been claimed, but it seems to me that it is the sort of claim which is sometimes pursued and which was realistically withdrawn.

129. All the other items of loss are agreed except item (g) for £9,750 for cost of labour for hot zone rebuilding and item (j) for £13,579 diversion of management time.

130. As to item (g), I accept VAS's submission that this has been put forward on an inappropriate basis: it is put forward on the basis of what it would have cost to bring in outside labour to do the work. That is not the appropriate approach to work done by Bodycote's own labour. As I do not have figures for what Bodycote's own labour cost on an hourly or daily basis, I regard this item as not having been proved.

131. As to item (j), the criticism is made that records were not kept of the time spent by management. Whilst this could, and perhaps should, have been done, I have heard from some of the managers involved. It seems to a reasonable estimate of the management time which was involved in dealing with the significant problems arising from the 5 July incident, and I allow this head of claim in full.

The hearing before me

132. Finally, I record that the hearing before me took place remotely. Such a hearing only succeeds if there is co-operation from all involved. I would like to record my thanks and appreciation to all those involved, counsel, solicitors and witnesses (as well as the Court staff) who made the hearing possible.

133. I would also like to commend the considerable skill displayed by both counsel, who conducted the hearing with great courtesy and efficiency.