THE GRENFELL TOWER INQUIRY

PHASE ONE
CLOSING SUBMISSIONS ON BEHALF OF PSB UK LIMITED
DATED 6 DECEMBER 2018

---

1. These submissions are made on behalf of PSB UK Limited ("PSB").

2. PSB is a specialist company trading as a smoke control and air movement solution provider. PSB was involved in the design and commissioning, after its installation by others, of the smoke control system ("the System") extant at Grenfell Tower at the time of the fire. The System formed part of the existing active fire safety and protection measures at the Tower.

3. As promulgated by the Inquiry, Phase 1 of its investigation has focused on the factual narrative of the events of the night of 14 June 2017. It has been guided by, inter alia, the following issues:

   The existing fire safety and prevention measures at Grenfell Tower, and
   How the fire and smoke spread from its original seat to other parts of the building.

4. In relation to each of the issues in respect of which the Inquiry may consider the System relevant, it is plain that the important investigative work of the Inquiry is incomplete and, despite its no doubt best endeavours, the evidential picture remains unfinished.

5. PSB has been informed by the Solicitor to the Inquiry that it will not be reaching any conclusions in Phase 1 on the compliance of the System with extant Regulations, Standards and Guidance[1]. Based on the evidence received by the Inquiry to date that is the only approach capable of being taken. Safe conclusions are incapable of being made

[1] Letter, Solicitor to the Inquiry to the RLR for PSB UK Ltd. Et al, dated 26 October 2018.

by the Inquiry and its appointed experts in this respect on the evidence considered so far.

6. In relation to whether the System operated as intended on the night, PSB has been told[2] that many lines of enquiry remain ongoing with further investigations under way; these will not be complete in Phase 1 and will therefore continue into Phase 2. At this time, the Inquiry experts are unable to reach a view on this issue. Consequently, and again, no meaningful or safe conclusions could be made by the Inquiry at this juncture.

7. During the course of Phase 1, the Inquiry has published volumes of expert material in the form of written Reports which have been written by those experts based on their instructions and the evidence available to those experts at the time of writing. So far as the System is concerned, as is made clear by a number of those experts in the Reports and in the oral evidence given by relevant experts in Phase 1, the opinions expressed are provisional and will be subject to further work at Phase 2.

8. Whilst acknowledging the exigencies under which the Inquiry has operated during Phase 1, it is hoped that going forwards into Phase 2 a framework will be provided to enable Core Participants to properly engage with the underlying evidence disclosed to the Inquiry experts and to test the evidence adduced by them. PSB would strongly advocate for such a framework given the importance of the matters being considered by the Inquiry experts.

9. In the circumstances, it follows that these submissions are inevitably limited in their scope and content; that is simply a reflection of where matters stand and the current status of the evidence and nothing more.

10. It is very important to PSB to make it absolutely clear that it has to date and will continue to afford its full cooperation and provide whatever assistance it can to the Inquiry.

---

[2] Letter, Solicitor to the Inquiry to the RLR for PSB UK Ltd. Et al, dated 26 October 2018.

The existing fire safety and prevention measures at Grenfell Tower

11. As noted above, the System was but one layer of the existing fire safety and prevention measures at Grenfell Tower.

12. Each stage of the involvement of PSB in the design and commissioning of the System has already been provided in chronological order to the Inquiry. A detailed written Opening Statement was also provided on 18 May 2018 and has remained available on the Inquiry website.

13. The Inquiry has now published two substantive Reports by Dr Barbara Lane[3] which touch on the passive and active fire safety and prevention measures in Grenfell Tower including the System. Both Reports are based only on post-fire site inspections and the design and construction stage documentation seen by Dr Lane to date. The preliminary and provisional nature of the opinions expressed is therefore apparent; indeed, this has been made plain most recently in evidence[4].

14. Given the timing of the disclosure of the latest iteration of the Report of Dr Lane, PSB's consideration of the provisional opinions expressed therein remains ongoing.

15. The PSB design was for a mechanical ventilation system which used de-pressurisation principles in order to control smoke in a common lobby and protect the common stair. De-pressurisation systems induce pressure differentials and/or air flows to inhibit smoke spread. Consequently, PSB drew upon some of the further Guidance in BS EN 12101-6:2005 and the specific performance criteria set out therein to develop its building appropriate solution, given the existing structure and limitations posed by the nature of the refurbishment.

---

[3] Dr Barbara Lane, Phase 1 Report, dated April 2018 and dated variously in October and November 2018.

[4] For example, 26 November 2018: Page 149, line 11; Page 160, line 2.

16. The regulatory and guidance framework extant at the time of the design of the System afforded a significant margin of flexibility to designers when they were looking to contribute towards meeting the relevant Requirements of the Building Regulations, and this will need to be considered in detail and with care during Phase 2. Approved Document B 2013 ("ADB 2013") to the Building Regulations provides Guidance as to how the Requirements of the Building Regulations may be met whilst confirming that "*there may well be other ways of achieving compliance with the requirements*" and "*thus there is no obligation to adopt any particular solution contained in an Approved Document if you prefer to meet the relevant requirement in some other way*"[5].

17. The further Guidance on the design of smoke control systems using pressure differentials available in BS EN 12101-6:2005 is likewise not prescriptive; it provides flexibility.

18. Consequently, PSB welcomes, at the very least, the statement recently made in evidence that Dr Lane is intending to investigate what, if any, alternative compliance approaches may have been adopted in Phase 2[6], including in relation to the System itself[7].

19. Moving into Phase 2, PSB submits that minds must remain open so far as the ongoing assessment of the System is concerned given the importance of getting consideration of all matters relating to the fire at Grenfell Tower right.

How the fire and smoke spread from its original seat to other parts of the building

20. PSB notes the provisional observations raised by Dr Lane in relation to the adequacy of the System and potential smoke leakage. On any view, these concerns are very much in their nascent form and PSB agrees with the indication from the Inquiry and its experts that no conclusions can be drawn in this Phase.

---

[5] ADB 2013, page 5, Use of Guidance, The Approved Documents

[6] 22 November 2018: Page 21, line 20

[7] Dr Lane, Phase 1 Report, Appendix J, §J1.1.13 [BLAS0000031_0006]

21. No doubt the Inquiry will fearlessly investigate the matters raised by Dr Lane. However, the Inquiry will also need to have regard to the views of its other experts in relation to this and other respects before coming to any of its own conclusions.

22. No other expert placed emphasis on the System as a possible route for smoke movement and contamination on the night of the fire. Professor Torero[8] and Professor Purser[9], when they were asked to specifically comment on the provisional views expressed by Dr Lane, both accepted they needed to be investigated, but both reminded the Inquiry of the limitations of any such system in the context of a rapidly expanding multi-story external and internal fire as happened at Grenfell Tower.

23. For the sake of completeness, there are some further sub-issues which PSB should also want to briefly address as follows.

Whether the System operated as intended on the night of the fire

24. As noted above, this is not a matter in respect of which the evidence enables safe conclusions to be drawn in Phase 1.

25. This is an area which perhaps demonstrates the value of receiving and considering the totality of the evidence, and the forensic detail of it, before statements are made and conclusions drawn as to whether the System operated as intended on the night of the fire or not.

26. There is now a substantial amount of evidence[10] which suggests that the System activated on the night, which, as the Inquiry has indicated, merits further consideration in Phase 2.

---

[8] Professor Torero, 20 November 2018, page 191, from line 8. See below at §46.

[9] Professor Purser, 29 November 2018, page 169, from line 24.

[10] This includes: evidence from fire fighter witnesses; evidence from BSR witnesses and other forensic evidence. Dr Lane reports [Report, 24 October 2018, Appendix J, BLAS0000031_0150] that: "*There is a substantial amount of evidence from residents about*

Interaction with the System on the night of the fire by the LFB

27. Linked to the above and the issue of whether the System operated as intended on the night is the topic of what interaction the LFB had with the System, when, and to what effect, if any.

28. The indication, following the most recent oral evidence of the experts, including Dr Lane, is that this too is going to be the subject of further consideration in Phase 2. That approach would seem appropriate given that the evidence of Mr S McGuirk, the fire fighting expert appointed by the Inquiry, is also still to be received and considered.

29. For present purposes PSB should therefore want merely to flag the following matters, noting that no criticism of the LFB or any of its personnel is intended.

30. PSB was struck at times during the evidence of fire fighters by the disconnect between the apparent expectations that some fire fighters appeared to have in relation to smoke control systems and the actual design basis for such systems as per the Guidance in ADB 2013. Consequently, the limitations of the System at Grenfell Tower (see further below at §41 onwards) did not appear to be understood by some fire fighters when they were giving evidence to the Inquiry.

31. On the other hand, LFB policy and procedure does seem to recognise the limitations of smoke control systems and the risks that need to be properly assessed before any such system may be used on the fire ground.

32. Specifically:

33. LFB Policy 633 at §§7.52 to 7.57, Ventilation: this makes plain that ventilation should only be undertaken on the instruction of the incident commander. Before any system is

---

the operation of the system on the night" [J10.1.10]; "*The autodialler had sent a signal to Tunstall by 00:55, and there is no evidence of smoke at that time on any other floor*" [J10.1.14]; "*It appears most likely that the smoke control system activated on Level 4 at this stage*" [Report J10.1.14].

operated the incident commander is asked to consider a series of factors to assess the risks associated with the use of such systems. It is stated that, "7.53 *If the risk cannot be properly assessed or sufficient control measures implemented, ventilation should only be undertaken in the post fire stage*"[11].

34. National Fire and Rescue Authorities Operational Guidance, Generic Risk Assessment Document 3.2, at page 29: this contains similar instruction and adds that the incident commander must not make any changes to a high rise building's ventilation or fire safety systems without first taking appropriate advice, from either the 'responsible person' or appropriately trained Fire and Rescue Authority personnel[12].

35. In relation to the night of the fire, and in the circumstances of: the extraordinary event presented by the fire; the design limitations of the System (as per ADB 2013), and the risk-based assessment and decision making process required of an incident commander before any such ventilation method could be used on the fire ground, it is difficult to see how any LFB incident commander could be expected to consider deploying the System to any meaningful effect on the night.

36. In any event, the fact is that WM Dowden and SM Walton first approached the System's HMI panel located in the ground floor lobby of the Tower at 02:02.21. WM Dowden was no longer the incident commander at this time. WM Dowden did not remember trying to actuate the HMI panel itself. So far as the yellow fireman's override switch ("FOS") located in the ground floor lift lobby area was concerned, he said:

Q. You say: "I went to activate the point using the keys and switch it to manual, but decided against this as interfering with any fire solution within a building can worsen conditions for both the residents and the firefighters." What would have been the purpose of switching it to manual, which of course you decided against? What would be the idea there?

A. The idea would be to potentially -- you know, to try and clear the stairwell of any smoke. But I, you know, didn't have an understanding at that point of the internal --

[11] LFB00001256_0014

[12] LFB00001255_0031

how the internal building was behaving, if indeed it was working, and generally something of that nature should only be facilitated within our policy, as it is in high-rise policy 633, by the responsible person of that building or a trained fire safety officer of a station manager rank or above.

Q. Yes.

A. So I was very conscious that I didn't want to actuate that in case I worsened conditions within the stairwell for either the residents or the firefighters.[13]

37. SM Walton had no interaction with the HMI panel or any FOS.

38. Ultimately, such interaction as the Inquiry may find happened, as between WM Dowden and SM Walton in relation to the System, was over by 02:02.59; some 38 seconds in total.

39. PSB acknowledges that these are matters to which the Inquiry is likely to return in Phase 2.

Conclusion

40. It is acknowledged that in relation to the passive and active fire safety measures in place at Grenfell Tower on the night of the fire, a certain fluidity has been maintained by the Inquiry as to Phase 1 and Phase 2 issues. This is perhaps most evident in the expert Reports that have been published by the Inquiry to date.

41. However so far as the System is concerned, and irrespective of any design and compliance issues, it is submitted that sight should not be lost of the important limitations of all smoke control systems as presently designed for, including the System at Grenfell Tower.

[13] WM Dowden's evidence, 26 June 2018, from page 132, line 20

42. First, ADB 2013 says that fires do not normally start in two different places in a building at the same time and that there is a low probability that a fire will spread beyond the flat of fire origin[14].

43. Second, the design basis for smoke control of common escape routes assumed in ADB 2013 is a fire starting in a single location and being contained within a single compartment[15].

44. Third, smoke control systems are therefore only intended to address the effects of a fire on one floor and to deal with smoke from a single compartment[16].

45. Fourth, as a result of the above, the System was intended to operate on one floor only, as per the requirements of ADB 2013[17].

46. Fifth, the System could not therefore have prevented smoke from fires on multiple floors impacting lobbies and the common stair on multiple levels[18] [19].

---

[14] Dr LANE, Report, 12 April 2018. Appendix J, J3.2.1 [BLAR00000025_007]. Report, 24 October 2018. Appendix J, J5.1.1 [BLAS0000031_0020]

[15] Dr Lane: Report, 12 April 2018. Appendix J, J3.2.2 [BLAR00000025_007]. Report, 24 October 2018. Appendix J, J5.1.2 [BLAS0000031_0020]

[16] Dr Lane: Report, 12 April 2018. Appendix J, J2.1.11 [BLAR00000025_006]. Report, 24 October 2018. Appendix J, J5.1.2 [BLAS0000031_0020]

[17] Dr Lane: Report, 12 April 2018. Appendix J, J9.4.3 [BLAR00000025_0030]. Report, 24 October 2018. Appendix J, J1.1.24 [BLAS0000031_0008]

[18] Dr Lane: Report, 12 April 2018. Appendix J, J9.4.4 [BLAR00000025_0030]. Report, 24 October 2018. Appendix J, J1.1.24 [BLAS0000031_0008]

[19] Dr Lane's evidence, 26 November 2018, Page 182, line 16:

Q. If we leave aside the damper compartmentation issue for a moment and simply assume that the system was compliant but it didn't work on the fire floor on the night, would you agree that that would have limited effect on the spread of fire and smoke throughout the building?

A. A perfect system designed to either extract smoke or limit smoke movement on one floor obviously cannot operate on all floors simultaneously unless such a feature was provided.

47. It follows that in respect of Grenfell Tower:

48. The System was required to perform during an extraordinary event – a multi storey fire[20].

49. In the opinion of Professor Torero:

> "*A correctly designed and specified system would be sized to perform within the framework of a contained single compartment fire, with the intention of maintaining a single lobby as passable. Given the scale of the event and the number of lobbies that were simultaneously compromised by smoke ingress, a fully functioning, compliant system would have provided negligible benefits to egressing occupants, thus any discussion of its compliance or functionality is secondary in the context of the Grenfell Tower fire*"[21].

50. In the opinion of Professor Bisby:

> "*Furthermore, when the cladding fire at Grenfell Tower did spread vertically, none of the other fire safety design features of the building – all of which are described in detail by other instructed experts to the Inquiry – could have been expect to function as required or as intended by their design. This is because these other measures are, in general, designed to cope primarily with isolated compartment fires. The available evidence suggests that fire compartmentation was not a credible component of any fire safety strategy once the refurbishment cladding had been installed at Grenfell Tower*"[22].

---

[20] Dr Lane, Report, 24 October 2018. Section 2, 2.13.3 [BLAS0000031_0020]

[21] Professor Torero, Report 23 May 2018, 5.3.2.3.6 [JTOR00000001_0105].
Professor Torero, 20 November 2018, transcript page 191, from line 8. When specifically asked to speak to Dr Lane's provisional views in Appendix J, Professor Torero said "…. *I think we have to keep in mind that it was a system that was designed for a one-floor fire and that is a fundamental weakness of the system, not necessarily the non-compliances*".

[22] Professor Bisby, Report, 21 October 2018, paragraph 751 [LBYS0000001_0152

51. In the opinion of Dr Lane, and notwithstanding all of the other provisional views expressed in the latest iteration of her Report, it was not possible, by reference to active and passive fire protection measures, to mitigate the type of fire caused by the materials used during the external refurbishment of Grenfell Tower[23].

52. For the sake of completeness, it is submitted that the Inquiry is not in a position to articulate, consider and properly make any interim recommendations in relation to smoke control systems; there is no evidential basis on which to proceed to do so.

Dated 6 December 2018

Shoosmiths LLP

[23] Dr Lane, 22 November 2016, transcript page 183, line 2:
"I don't think it's possible, with the external wall construction that there was, to mitigate the type of fire that those materials cause, and that's a whole combination of active and passive fire protection measures, and their condition. I don't think it's possible to mitigate that type of fire, which is why I said the building should not have been handed over in that condition."