GRENFELL TOWER INQUIRY

PHASE 1 CLOSING STATEMENT ON BEHALF OF BSR REPRESENTED BY BHATT MURPHY, BINDMANS, HICKMAN & ROSE, HODGE JONES & ALLEN

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1. INTRODUCTION

The Inquiry

1.1. The purpose of any public inquiry lies in the statutory trigger for its establishment, which is an event that has caused such "*public concern*" as to make a Minister conclude that an independent process of fact finding and recommendations is the only viable means to restore public confidence: s.1 Inquiries Act 2005 ('IA 2005'). The ensuing process of accountable learning in public is a major feature of any democracy when things go profoundly wrong.

1.2. Inquiries are tribunals of *truth*, not proof, and *responsibility*, not liability. The distinction is reflected in s.2(1) of the IA 2005 which states that an inquiry cannot "*rule on, and has no power to determine, any person's civil or criminal liability*" but in s.2(2) makes clear that "*...an inquiry panel is not to be inhibited in the discharge of its functions by any likelihood of liability being inferred from facts that it determines or recommendations that it makes*".

1.3. Although an inquiry is not a trial, that does not mean that matters of law are irrelevant to its process. Nothing in s.2 IA 2005 prohibits an inquiry making findings that declare breaches of public and regulatory law, which do not in themselves constitute civil or criminal liability. It can also make findings that amount to the constituent elements of civil wrongs and criminal acts, provided that they do not purport to determine the liability of a person. As part of its function, this Inquiry must decide whether conduct that is relevant to the cause and circumstances of the fire was in accordance with law, or not.[1]

1.4. An inquiry is not required to find facts to a certain standard of proof. The major public inquiries of recent times have adopted "*a flexible and variable standard*"[2] for describing the basis of their findings. Justification for this settled approach, which pre-dates IA 2005, now also lies in s.24 (1), which notably avoids any prescription as to the standard or degree of certainty for determinations of fact, other expressions of view or for the making of

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[1] e.g. *R (Pounder) v Coroner for the North and South Districts of Durham and Darlington* ([2009] EWHC 76 (Admin)) [2009] 3 All ER 150 §73. See *Report of the Azelle Rodney Inquiry, Chaired by Sir Christopher Holland, HC-552,* 5 July 2013 [1.6.2], [19.1-19.11] and [21.13] describing the unreasonable and therefore unlawful use of fatal force on the deceased, and *Report of the Alexander Litvinenko Inquiry*, Chaired by Sir Robert Owen, HC-695, 21 January 2016 [2.26], [8.65-8.68] and [10.13], which found to the criminal standard various matters of unlawful killing [9.201-9.215] and [10.14-10.16].

[2] Formulation of Sir William Gage in the Baha Mousa Inquiry

recommendations.[3] It should *"record the level of satisfaction which [it] find[s] established in relation to any finding of fact"*.[4]

1.5. When the Inquiry comes in due course to fact finding in relation to individual deaths, the test for causation is whether, on the balance of probabilities, the conduct in question more than minimally, negligibly or trivially contributed to death.[5] However, in fulfilling the terms of reference, and otherwise complying with its positive duty under Article 2 ECHR to contribute to the prevention of future death, the Inquiry must also identify matters relating to the circumstances of the fire that are established to be *potentially* relevant to the cause of death.[6]

Phase 1 findings sought

1.6. The evidence so far supports findings of (a) patent non-compliance with the Building Regulations 2010 ('BR 2010'), and (b) clear breaches of duty under the Fire and Rescue Services Act 2004 ('FRSA 2004'), the Civil Contingency Act 2004 ('CCA 2004'), and the Human Rights Act 1998 ('HRA 1998'). This is of course not to say that the conclusions to be drawn from the evidence to date are limited to such *legal* findings.

1.7. The breaches of legal duties outlined in these submissions at the very least more than minimally, contributed to the deaths of 72 people. At Phase 2, questions of attribution and the true extent of contribution made by these and other failures, will of course need to be considered.

1.8. The refurbishment involved material alterations that were not compliant with the functional requirements of B4(1) and B3(4) of the BR 2010. In particular:

(1) In breach of functional requirements B4(1) and B3(4), the façade and its component parts did not adequately resist the spread of fire over its walls, nor did they inhibit the unseen spread of fire within concealed spaces in the building's structure and fabric.

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[3] In mandating the chairman to deliver a report to the Minister setting out: "*the facts determined by the inquiry panel*' and "*the recommendations of the panel*", but continuing, "*The report may also contain anything else that the panel considers relevant to the terms of reference*".
[4] Ruling of Sir William Gage 7 May 2010. See also *Azelle Rodney Inquiry Report* [1.12], *Report of the Mid-Staffordshire NHS Foundation Trust Public Inquiry*, HC 898-1, 6 February 2013, Vol 1 Part 1, [79-100], and *Report of the Alexander Litvinenko Inquiry* [2.20] and Appendix [122-123].
[5] *R (Tainton) v HM Senior coroner for Preston and West Lancashire* ([2016] EWHC 1396 (Admin)) [2016] 4 WLR 157 §41, *R (Maugham) v Senior Coroner for Oxfordshire* [2018] EWHC 1955 (Admin) §22.
[6] *R (Lewis) v HM Coroner for the Mid and North Division of the County of Shropshire* ([2009] EWCA Civ 1403) [2010] 1 WLR 1836 §§28-29, 38-39.

(2) In breach of functional requirement B3(4), the window assemblies were not constructed in such a way as to inhibit the unseen spread of fire within concealed spaces in the building's structure and fabric.

1.9. While the LFB did not cause the fire, it did not comply with its obligations to protect life under the FRSA or Article 2 of the ECHR. In terms of (a) policy, training, planning, and equipment,[7] (b) operations at the fire ground[8], and (c) the control room:

(1) It unreasonably failed to take steps that offered a realistic prospect of preventing the deaths by failing to plan and train for the foreseeable prospect of a fire of this nature.

(2) It unreasonably persisted in maintaining a stay put strategy and failed to instigate an evacuation of the building once it was clear that compartmentation had failed and in response to real and immediate risk to life, causing considerable greater loss of life.

1.10. The emergency response of the Category 1 responders fell short of the requirements of the CCA 2004 in so far as (a) major incidents were declared separately by the police, LFB and LAS, (b) inter-agency communication was deficient, and (c) RBKC failed to provide reasonably obtainable information to assist the lead responder.

1.11. These conclusions are inescapable on the evidence heard in Phase 1. There is a clear and pressing public interest in publicly declaring them as soon as possible.

2. THE BUILDING

[A] THE TOWER IS RAPIDLY OVERWHELMED BY AN ORDINARY KITCHEN FIRE

2.1. The travesty of Grenfell is that the fire event which overwhelmed it was one that the Tower's original design contemplated and could easily have resisted due to its concrete compartmentation. The moment the Tower was enveloped in patently non-compliant cladding materials, which would both ignite easily and burn rapidly, its fire safety strategy (which depended on the stay put principle and in turn on compartmentation) was rendered invalid and dangerous.[9]

2.2. A fire safety strategy is the "*…concept by which different measures are taken to guarantee a societally accepted level of safety of people against fire.*"[10] Each individual

[7] See especially submissions from Howe & Co who will develop this point
[8] Bishop Lloyd Jackson and Oliver Fisher will deal with the failures in communicating FSG within the fireground
[9] As Torero says: "*... any form of vertical flame spread disables every element of the fire safety assumptions underpinning the Grenfell Tower design*": lines 771-2 JTOS0000001_0025
[10] Torero lines 477-8 JTOS0000001_0018

active or passive safety measure is imperfect and cannot be relied upon, on its own, to protect the lives of people. Multiple levels of "redundancy" are instead introduced, so that the probability of the whole chain failing is low.[11] Compartmentation is an example of redundancy and it lies at the heart of most fire safety strategies.[12] The greater the number of active and passive safety systems in a building which fail, the greater the severity of consequences.[13] At Grenfell, all passive and active systems, except the concrete structure, were overwhelmed.

2.3. It is clear from the experts' evidence that the installation of this particular cladding system, so *complex* and *intricate* (in a chaotic rather than ordered way) as to render its performance incapable of assessment,[14] inexorably led to the disaster that followed. As Dr Lane forcefully put it,[15] Grenfell should never have been handed over with this particular rainscreen system given the stay put policy, even if the active and passive systems had been in good working order.

2.4. In Dr Lane's view, the scale of the fire that inevitably ensued could not be mitigated. The Tower represented a health hazard so egregious that it *should never have been occupied*, and also posed a risk to the Fire Brigade.[16] Given the combination of fire inevitability[17] and a stay put policy, it is no exaggeration to describe the Tower, as refurbished, as a death trap.

The predictable nature of a kitchen fire: "*An inevitable, perfectly foreseeable event*"[18]

2.5. A compartment fire is an inevitability in a block of flats: the probability of such a fire occurring is 1.[19] Torero's modelling[20] suggests that the size of the fire within the compartment of Flat 16 was between 60kW (paper basket size fire with a hot smoke layer of 110°C) and 300kW (no bigger than half a chair or a frying pan with a hot layer of

[11] Torero T77/11/21 to T77/12/14
[12] Torero lines 528-531 JTOS0000001_0019-20, Lane T79/54/2-55/12 and T81/17/15-22. See also Torero T77/10/14-18.
[13] Lane T81/7/15-17
[14] Torero T77/111/2-25
[15] Lane T79/183/2-16. She confirmed that the cladding as configured at Grenfell was unsuitable for a stay put policy: T79/100/12-15. Echoed by Bisby LBYS00000001_0152: *"... a stay put policy was ... not a credible component of any fire safety strategy once the refurbishment cladding had been installed"*.
[16] Lane T79/170/12-15
[17] Torero T77/97/13-98/1
[18] Torero T77/97/13-98/1
[19] Torero T77/16/12-18 and T77/97/8-98/1
[20] Which was feasible because the fire never reached flashover, such that the maximum smoke layer temperature and maximum fire size can be calculated by using the dimensions of the kitchen: JTOS0000001_0037.

220ºC).[21] Given the small size of the kitchen it did not matter where in the room the fire occurred because it would affect the whole compartment almost simultaneously.[22]

2.6. Given that the initial fire event was an inevitable occurrence, determination of the cause and origin of the fire is secondary to understanding the development of the fire, first into the façade, and then once the façade was ignited.[23]

Professor Torero's four stages of the night

Stage 1: Breach of the compartment of Flat 16 (00.54 - 01.05/01.13)

2.7. The two most probable routes by which the fire escaped the compartment of Flat 16 and entered the cladding are (1) through the window surround, once the uPVC had deformed/fallen away, and (2) through the extractor fan or window. The most probable route is via the deformation/falling away of the uPVC window surround:

(1) The uPVC served as a single barrier between the interior of the Tower and the components of the cladding system. Once the uPVC was breached, the components of the cladding system were exposed to hot smoke/flame.[24]

(2) All three fire spread experts consider this the most probable route. Lane considers the fire exited the top of the window where it meets the column.[25] Torero[26] and Bisby (Hypothesis B2)[27] also favour this route although they approach it by different but complementary analyses: Torero uses fire dynamics and Bisby analyses photo/video images to determine the sequence of ignition of the cladding. Torero stressed that both analyses are to be considered, are viable, and complementary.[28] Torero and Bisby consider the uPVC will drastically lose strength at 60ºC and lose 100% by 90ºC.[29] Torero considers that loss of strength will occur in 5-11 minutes.[30]

2.8. Ignition via smoke venting from the window is not a likely scenario. Torero is satisfied this was not the means of escape. The ignition temperature of the PIR, PE and uPVC

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[21] Torero T77/23/14-21 and 55/6-11
[22] Torero T77/20/17-23
[23] Torero lines 1568-70 JTOS0000001_0055
[24] Torero T77/51/7-16: *"...the uPVC serves as a cover for a whole array of other materials that could potentially burn. Now, uPVC is a material that, from a flammability perspective is a very robust material, it's a material that's very difficult to burn. So in principle it could potentially be an adequate protection layer...nevertheless, uPVC has a particularity, which is that it loses its mechanical strength at very low temperatures, so effectively can actually fall off".*
[25] Lane [10.3.7] BLAS0000010_011
[26] T77/51/7 -58/17
[27] "*By a nose*" over his Hypothesis B1 (escape through window or fan): T78/124/25-135/11
[28] Torero T77/64/1-14 and 69/5-9
[29] Fig 9 JTOS0000001_0041 and T77/54
[30] T77/56/3-7

ranges between 306 to 415ºC.[31] Smoke from any fire within the compartment reached a maximum of 230ºC: insufficient to ignite the ACP above the outside of the window of Flat 16 or the adjacent combustible materials by direct flame impingement.[32]

2.9. Beyond recognising that the deformation or falling away of the uPVC likely occurred first and exposed a complex system of combustible materials to heat and smoke which facilitated ignition, it is not realistic or helpful to seek to analyse the precise sequence in which the materials burned: *"the importance to the overall outcome of what was the first thing to catch fire is probably not that significant"*.[33]

2.10. The properties of any given material do not indicate which would ignite first: while those with low thermal inertia will ignite much faster, it would depend where each material was in relation to the flame.[34] Further, the contribution of exposed polyethylene edges of the Arconic aluminium cladding panels will have changed the outcome, but it is now extremely difficult to identify the significance.[35]

2.11. Both Torero and Lane agree that in the event of any fire starting near a window there was a disproportionately high probability of fire spread into the cladding.[36] Bisby considers it was *likely*.[37]

2.12. Definition and timing of breach of compartment: two competing views. Whichever view is accepted as correct, all three experts agree that the fire had breached the compartment between 01.05 and 01.13 and had *very obviously* breached the compartment by between 01.11 and 01.13, as explained below.

2.13. View 1: On leaving the fire compartment:

(1) Torero's view is that the compartment is breached at a defined moment in time, namely when the fire is within the cladding outside Flat 16 which he says occurred between 01.05 and 01.08[38] and was *"fairly obvious*" by 01.11.[39]

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[31] Table 1 JTOS0000001_0037
[32] See JTOS0000001_0050-52 and T77/62/6-68/20
[33] Torero T77/78/3-13
[34] Torero T77/78/25-79/21
[35] Torero T77/81/5-15: *"they are going to change the outcome, in the sense that the exposed sides will ignite faster than the areas that are not exposed. But ... given... the proximity of all these materials, the complexity of the cavity, and the nature of the fire event, it's extremely difficult to work out to what extent that would've mattered or not"*.
[36] Torero T77/97/3-7, Lane [2.9.14] BLAS0000002_0015
[37] Bisby T78/106/1-9
[38] Torero T77/98/17-99/11
[39] Torero T77/100/2-17

(2) Bisby was willing to accept that the compartment was breached at the moment when the fire was in the cladding outside Flat 16, because of the inevitability of fire spread in this case. Bisby considers that the fire was within the cladding by about 01.09.30.[40]

2.14. View 2: On entering another fire compartment:

(1) Lane's view is that, from the perspective of ADB, compartmentation is not assumed to have been breached until the flame is in the next compartment, and on this basis compartmentation is breached at 01.13.[41] Lane used Diagram 33 of ADB 2010[42] to explain this point, but ADB does not define when compartmentation is breached, and it clearly implies that it is breached on spread beyond the compartment of origin: *"Measures in s8 (B3) provide a high degree of compartmentation and therefore a low probability of fire spread beyond the flat of origin so that simultaneous evacuation is unlikely to be necessary."*[43] The thrust of the provisions is simply that if a fire is not contained within a compartment there will be a bigger fire[44] and clearly for buildings designed on the basis of a stay-put strategy, the viability of that strategy depends on compartmentation. Once the fire is in the cladding it is, by definition, no longer within the compartment of origin.

(2) Bisby considers that in an ordinary case, where external fire spread was not inevitable, the compartment is not breached until the floor above Flat 16 was breached.[45] He agrees the fire was in the cavity above Flat 16 by 01.13.31.[46]

2.15. Once compartmentation is breached, evacuation is the only viable option:

(1) Professor Torero's clear view is that once compartmentation is breached evacuation is *necessary* to secure the safety of those in the building and is the *only viable option* at that point.[47]

(2) While Dr Lane was unwilling to say that stay put had failed at the precise moment when compartmentation had been breached, she accepted a "*high degree of compartmentation*" was needed to support a stay put strategy and that where that

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[40] Bisby [683-5] LBYS0000001_0143
[41] Lane T79/165/5-167/10
[42] Provisions for cavity barriers: CLG00000224_0082
[43] ADB 2013 para 2.3 p.21, cited by Lane [2.11.11] BLAS0000002_0021. Wording unchanged from ADB 2010 para 2.3(c) CLG00000224_0023.
[44] Para 8.1b CLG00000224_0073
[45] Bisby T78/146/10-150/18
[46] Bisby T78/131/4-132/19: *"at this point it's quite clear that the cladding is involved, the ACM cladding cassettes are involved and that this fire is likely to escalate up the building..."*
[47] Torero T77/101/2-11 and T77/121/5-10

cannot be achieved, a total evacuation is "*highly likely to be needed.*"[48] On her view compartmentation had been breached at 01.13, but stay put did not substantially fail until 01.26, which she selected on the basis that 20 flats were on fire at that point.[49] In expressing this view, Dr Lane appears to have focussed on the point at which the failure of stay put ought to have been perceived by firefighters.[50]

Stage 2: Vertical fire spread up the east face (01.05 - 01.29[51])

2.16. Vertical spread at Grenfell (from the fire being visibly in the cladding to reaching the top of the east face) took approximately 12 to 15 minutes and averaged 4 metres per minute. That rate of spread puts Grenfell among the slowest of twelve international cladding fires (the fastest being 22 metres per minute).[52] Vertical flame spread is self-accelerating as it pre-heats the area above it and hence is usually 10 times faster than lateral spread which tends to be a constant speed.[53]

2.17. From the early stages (01.13 - 01.16) the fire had spread along the vertex of column B5 and was burning visibly in the vertex of the junction between the column line and the faces of the spandrel.[54] During vertical flame spread the flame propagated laterally northwards but not southwards.[55] Between 01.18 and 01.28, the vertically propagating fire ignited internal fires on the 5th, 12th and 22nd floors.[56]

2.18. Combustion within the cavity in the column and in the cavity behind the spandrels is complex:

(1) Flames confined within a vertical cavity elongate as they seek oxygen and fuel to support the combustion process leading to flame extension of five to ten times that of the expected unconfined flame lengths even if the cavities did not contain combustible materials.[57]

(2) The role of the width of the cavity is fundamental to determining the extent to which the column/spandrel cavities acted as a chimney: if the width of the cavity is either

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[48] Lane T79/178/1-15
[49] Lane T79/166/22-171/15
[50] This is not a matter within Lane's expertise. Moreover, it is clear that the firefighters perceived a need for external firefighting, and therefore the failure of defend in place (which is the corollary of stay put) as early as 01.14: Lane section 13.5 of first report at BLAR000008_0007 and T79/172/17-173/10.
[51] Bisby [830-832] LBYS0000001_0159
[52] Torero JTOS0000001_0061 and T77/107/4-108/1
[53] Torero lines 1592 and 1621 JTOS0000001_0057-8 and T77/102/4-104/18
[54] Bisby [717-8] and [790-795] LBYS0000001_0148 and _0157, and T78/162-165
[55] Torero lines 1579-80 JTOS0000001_0056
[56] Torero lines 2451-3 JTOS0000001_0099
[57] Bisby [886] LBYS0000001_0181

too great or too small then the fire dies out. Cavity width is *"a very sensitive parameter that can have a huge impact on the outcome"*.[58]

(3) The complexity of the way the materials interacted with each other within the cavity is also highly significant.[59]

2.19. During this phase the flat no. 6s were evacuated and lobbies and stairs appear to have been relatively smoke free.[60] The second stage was what Purser describes as the *"golden early period during any fire when people can make a safe escape"* and after which the fire gets exponentially worse.[61]

Stage 3: Compromise of the interior: lateral fire/smoke spread (01.29 - 01.50/02.00)

2.20. This stage began when the fire reached the top of the east face and began to spread laterally by means of the crown[62]. An unusual feature of the Grenfell fire was that horizontal spread enveloped the entirety of the building within less than three hours.[63]

2.21. Although an unnecessary architectural feature, whose sole function was aesthetic,[64] the crown's contribution to lateral fire spread was devastating, with 24 lives taken from the 23rd floor alone. The rate of spread at the crown was 0.5 metres per second, "*setting the pace*" for lateral propagation.[65] It was "*essentially a fuse around the top of the building*".[66]

2.22. Lateral spread at the crown was significant for two particular reasons:

(1) It effectively compromised the flats above level 20. The rate at which the flats were penetrated was "*pretty much the same rate as the progression of fire in the crown*"; those flats were particularly prone to the effects of heating, melting and dripping of polyethylene.[67]

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[58] Torero T77/113/8-115/3: *"not 100 per cent sure if it's going to be detrimental or positive. But the cavity clearly has an effect."* See also Torero's Fig 26 JTOS0000003 as explained by him at T77/110/12-115/25.
[59] Torero T77/115/22-25, addressed further below in the context of materials
[60] Lane [2.14.9] noting some smoke between 01.21 - 01.35 BLAS0000002_0027, and Purser [21a] DAPR0000001_0008
[61] Purser T84/16/24-17/5
[62] Bisby [831]: flaming at top of crown continuous LBYS0000001_0159
[63] Torero T77/145/23-25. Bisby also comments on the unusual extent of horizontal spread at T78/201/1-202/6.
[64] Bisby T78/104/21-25
[65] Torero lines 2012-13 and 2036-7 JTOS0000001_0071 and _0074, and T77/147/10-15
[66] Bisby T78/199/8-16
[67] Torero T77/150/12-23

(2) Horizontal spread and vertical spread elsewhere over the façade was driven by the crown.[68] Melting and burning polyethylene and molten debris from the crown fell to lower levels, igniting fires that then propagated vertically upwards.[69]

2.23. The phenomenon of falling burning debris was also the key mechanism of horizontal spread at the lower levels, with opposed flow horizontal flame spread likely to have had a minor to negligible impact.[70]

2.24. The window assemblies provided various means for the external fire to re-enter the flats. Heat fluxes of the fire would generate thermal loads as high as 120kW/m^2 (an order of magnitude bigger than the design criteria of the components) which would inevitably cause a failure of the window glazing, the extract fans (and the surrounding infill panels) and the uPVC window surrounds, allowing for flame re-entry.[71] The precise route of fire ingress largely depended on the nature of the fire spread adjacent to the flat.[72]

2.25. During this phase, the evolution of the conditions of the stairs and the lobbies is very dynamic:

(1) Communal stairwells and lobbies on floors 10 - 14 and above floor 20 intermittently became actually or seemingly impassable to occupants by about 01.50. That is not to trivialise the experience of those who felt they could not leave: the physiological effects of the combustion products of fire are determinative of whether people live or die in a fire.[73]

(2) Smoke spread from the east to the west face relatively early on, at around 01.57 - 01.58. At this time the flame front had not yet reached the west of the Tower, suggesting a breach, already, of two layers of compartmentation.

2.26. The opening and closing of flat and stair doors appears to have played a key role in loss of compartmentation and smoke spread within the building during this phase[74], but the experts wish to carry out further investigation into how and when doors remained open.[75]

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[68] Torero T77/155/19-24 by reference to his fig. 35 at JTOS0000001_0078
[69] Torero T77/146/22 - 149/5
[70] Torero at T77/154/14-155/6 and T77/157/15-159/20. At T78/189/13-192/11 Bisby highlights the apparent diagonal flame front, which suggests that what appears to lateral spread is really the downward spread caused by dripping/falling molten materials.
[71] Torero T77/162/10-24 and T77/163/20-164/23
[72] Bisby T78/207/8-208/15
[73] Purser T84/10/3-9
[74] Torero T77/190/20-24
[75] Torero T77/173/17-188/23. Possible reasons include the absence or failure of self-closing mechanisms or firefighter intervention. Non-functioning door closing mechanisms appears to have been a particular problem in the flat 6s on each level: see footnote 332 below.

2.27. During this phase the toxicity of the fire effluents becomes particularly significant. The likely nature of toxic exposure of those in flats is outlined at section C below.

2.28. The convergence of timescales[76] also becomes particularly acute. The redundancies in the building are failing, limiting the opportunities for occupants to evacuate. The stairs and lobbies are affected by firefighting activities, potentially bringing them into conflict with occupants' need to escape.[77]

Stage 4: The untenable stage (02.00 until extinction of fire)

2.29. Torero and Purser define untenability as a combination of physiological conditions and behavioural conditions.[78] Both Torero and Purser observe that, although conditions in the stairs were often perilous, they were variable, such that escapes were possible after 3am.[79]

[B] THE CAUSES OF THE FAILURE OF THE TOWER

The root cause: façade and window assemblies

2.30. Compliance: As to flame spread on the exterior of a building, the overarching requirement is that of Functional Requirement B4(1) of the BRs which requires that the external walls *"shall adequately resist the spread of fire over the walls…having regard to the height use and position of the building*". Non-mandatory guidance on how this functional requirement can be achieved is given in the form of Approved Document B ('ADB'), which sets requirements for insulation and the outer surfaces of external walls by reference to national and harmonised European standards.

2.31. Lane has identified the reaction to fire classification which the products should have met by reference to the European harmonised standard BS EN 13501 which classes products as A1 (described as "non-combustible"), A2 (known in the national system as products of "limited combustibility"), or (below A1 and A2) classes B-F. As can be seen from Lane's table[80] there are similarly low limits of thermal energy output[81] imposed on both A1 and A2, but there are no such limits on classes B-F. Both A1 and A2 can[82] pass the

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[76] Explained by Torero at T77/7/6-9/19
[77] Torero T77/190/5-9
[78] Torero noted that this included *"conditions that are actually harmful to the individual, but also conditions that the individual perceives as harmful and therefore changes his actions because of them"*: T77/195/1-5. See also Purser T84/13/19-24.
[79] Torero noted that conditions were "*…very dynamic. So there are moments where effectively the stairs seem to clear up more than other moments. So I think they might simply have got the right window"*: T77/193/22-195/7. Purser [21(m)] DAPR0000001_0009.
[80] Figure F4 BLAS0000027_0025 and Lane T79/43/2-21
[81] Pouvoir calorifique superieur "*PCS*" of 2MJ/kg^2 for A1 and 3-4MJ/kg^2 for A2
[82] Lane notes that an A2 grading may be achieved without passing the non-combustibility test: [2.31.20] BLAS0000002_0086.

non-combustibility test BS1182. The relative flammability[83] of materials undoubtedly matters in terms of the ease of ignition and rate of burning.[84]

2.32. At Grenfell the insulation should have been minimum A2-s3, d2. The products used ranged from European classes D to F, where test evidence was even available.[85] The ACM cladding panels' surfaces should have been Class 0 (national) or B-s3, d2 (European) or better but there is no valid certificate supporting any such grading. Reynobond PE 55 cassette system was European class E, but even then, only when tested with a class A2 substrate.[86] As stated in opening, the G4 will submit in Phase 2 that the core of the panels should have been of limited combustibility given the functional requirement of the BR 2010 and the terms of ADB.[87] Instead, the core of the panels equated to diesel/lighter fuel[88] and is openly referred to by industry as petrol.[89]

2.33. Two principal[90] routes for compliance are postulated in ADB: a large scale test or the so called "prescriptive route". As there is no evidence of a large scale test, the prescriptive route was adopted by default and requires proof by product certificates, but none were provided.[91] Lane considers that not one of the materials in the façade complied with ADB or was compliant with the BR 2010 B4(1).[92] Professor Bisby is equally clear on requirement B4: "*This functional objective was clearly not achieved at Grenfell Tower.*"[93]

2.34. The consequences of this non-compliance were that fire would spread, the spread would be rapid, and once in the cladding, nothing could impede the spread of smoke and fire.[94]

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[83] A word Lane will not use but Torero and Bisby both do: see Torero T77/51/7-11 and Bisby's definition that in a regulatory context flammability quantifies the propensity of a material to burn with a flame under specified conditions and allow materials to be ranked based on tests on standardised apparatus (LBYS0000001_0019-20). Further, ignitability of products subject to direct impingement of flame BS EN ISO 11925-2:2010 which is only relevant to class B to D inclusive: see Lane F7.3.31-34 Reaction to fire tests BLAS0000027_0079.
[84] Bisby T78/159/2-6, Torero T77/125/4-10, and para 2.46 below.
[85] Lane provides a useful summary at table 11.10 BLAS0000011_0067. Key components: D (Celotex RS5000 and up to 7% Kingspan K15 on spandrels was class 0), E (Kingspan Thermapitch TP10), F (Celotex TB4000).
[86] Lane Table 11.7 BLAS0000011_0039
[87] Transcript of oral opening submissions from Stephanie Barwise QC T2/37/21-42/5
[88] Bisby presentation page 21 LBY00000189_0021.
[89] Transcript of oral opening submissions from Stephanie Barwise QC T2/33/18-21
[90] The other possible routes are fire safety engineering study (para 0.30 ADB CLG00000224_0015) or a desktop study as suggested by some industry bodies (BCA/NHBC), but these are not relevant to Phase 1 as they were not attempted.
[91] Lane T79/109/7-16
[92] T79/109/11-110/21, Lane [11.23] BLAS0000011_0095-97
[93] Bisby [750] LBYS0000001_0152
[94] Bisby T78/159/2-6: "*if a fire is ignited in a cladding system such as this made from these materials under any circumstances, we have to expect it to spread quickly and catastrophically because of the nature of the materials involved.*" Lane T79/164/11-14.

The windows

uPVC surrounds

2.35. All three experts acknowledge the alarmingly low temperature at which the uPVC loses mechanical stiffness.[95] The uPVC surrounds demonstrate the complexity of fire engineering design: on the one hand the material is fire retardant with a high ignition temperature;[96] on the other it deforms at a very low temperature. Whilst Lane would be more concerned by what lay underneath the uPVC than the material itself[97], Bisby noted *"If you are relying on this material to provide any sort of performance in a fire, you ought to be ...deeply suspicious of the ability to provide it"*.[98]

2.36. The uPVC surrounds acted, by default,[99] as (wholly inadequate) cavity barriers between the interior of the window and the cavity of the cladding. No proper cavity barrier was designed even though they are required around windows.[100] Accordingly the window assembly was not compliant with ADB, nor functional requirement B3(4) of the Regulations.[101]

2.37. The BRE report of 1992 to Government following the Knowsley Heights Fire cautioned against the use of uPVC (a *cellulosic* material) near polymeric materials such as the PE/ insulation.[102] Given the known toxicity of such materials[103] it is remarkable that they are used (and not prohibited) at a recognised point of fire re-entry, namely windows. What is clear at Grenfell is that the material was being relied on as a cavity barrier even though incapable of being one.

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[95] See para 2.7(2) above.
[96] 318-374°C: Torero table 1 JTOS0000001_0037
[97] T79/46/9-12
[98] Bisby T78/55/13-56/10
[99] Lane notes no cavity barriers shown and expresses the view that they *"... don't appear to have been considered"*: T79/57/8.
[100] ADB Diagram 33 CLG00000224_0082 and Lane T79/52/8-56/3. Torero agrees they are important but notes cavity barriers are not presently designed to prevent escape, they are only designed to prevent re-entry: T77/144/25-14/18, and Lane [11.20.21-29] BLAS0000011_0074.
[101] Which requires that *"The Building shall be designed and constructed so that the unseen spread of fire and smoke within the concealed spaces in its structure and fabric is inhibited"*: Lane [11.3.2] and [11.23.13] BLAS0000011_0095 and 97.
[102] "*There is no reason to suggest a life risk associated with cladding unless there are cavities large enough to allow vertical fire spread. There are implications for the protection of window reveals especially where refurbishment has involved the use of cellulosic and polymeric materials in close proximity*" CTAR00000018_0004.
[103] When uPVC burns it produces a very high yield of carbon monoxide ('CO'). If other materials are burning in under-ventilated conditions the uPVC will increase the toxic yield (CO and cyanide) of those other materials: Purser T84/5-167/22. Purser table 1 DAPR0000001_0063 estimates a purely indicative figure of 183.8 kg per two bedroomed flat and could intoxicate within 13 minutes based on number of windows in the 2 bedroom flats multiplied by their mass: T84/132/22-133/22.

The five key design failings in the window assemblies

2.38. Dr Lane draws attention to five principal issues with the window assemblies:

(1) The new windows were pushed outward compared to the originals. This brought two specific gaps into the internal wall construction, both of which were a potential path of fire spread.[104]

(2) The infill panels between the windows (comprising 13% of the façade between floors 4-23) were clad with Aluglaze insulating panels[105] with Styrofoam (XPS) cores. Given this is insulation it should have been limited combustibility. No test evidence has been disclosed, but product datasheets suggest it is class E.[106]

(3) A void was left between the retained non-combustible infill panels and the Aluglaze infill panels[107], which provided a route for fire spread.[108]

(4) The windows were reduced in size, leaving a 30-120mm gap between the sides of the windows and the column, which was covered with an EPDM membrane backed with Celotex TB4000 or Kingspan Thermapitch TP10 insulation (classes F and E respectively, instead of limited combustibility).[109] The EPDM led directly on to the insulation in the cladding cavity[110] and could be burned through rapidly.[111]

(5) The window surrounds contained highly combustible materials, including the original wooden sills and internal wood lining and the Purlboard insulation above and below the windows.[112]

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[104] (1) A vertical gap between the edge of the concrete spandrel and the face of the column, which was filled with a combustible expanding polyurethane product BLAS0000009_0012-13; (2) A horizontal void in the form of a sloping lip which had previously been on the exterior of the building. This was filled with 25mm combustible insulation: [9.2.13] and fig 9.6 BLAS0000009_0009.
[105] Melting temperature of 230°C "*Yes, they tend to melt. They generally have a very low thermal inertia.*" (Torero T77/132/14-15). National class 0, or European class B-s3, d2. She has found no test evidence suggesting Aluglaze met either of these classifications: Lane [11.10.13-14] BLAS0000011_0034.
[106] Lane [11.16.6] and [11.16.13-15] BLAS0000011_0061-62
[107] Lane [9.2.8] BLAS0000009_0007
[108] See e.g. Lane's fire scenario A BLAS0000009_0017-20
[109] Lane T79/38/17-21 and 44/2-9
[110] Lane noted, "*you could literally cut a hole [through]... and put your hand into the column cavity*": Lane T79/37/15-38/15
[111] Bisby said the EPDM offered "*negligible resistance to flame impingement and at [200-300°C] burn through quite rapidly*": Bisby T78/133/10-13. Torero observed that it was: *"...thermally thin, so this would've been a material that would've spread quite rapidly. It's particular location might not necessarily be as effective for vertical flame spread but, nevertheless, it's a material that will burn, its density is not low, so it will have a significant amount of mass and it will contribute to the burning*": Torero T77/137/3-11.
[112] Lane [8.7.4-7] BLAS0000008_0015

2.39. The type of reveal lining materials and how they were arranged provided *"no means to control the spread of fire and smoke"*.[113] They had no, or at best *"very little"*, fire-resisting performance.[114]

The façade as a system

2.40. The components of the façade function together: the materials interact in ways which are dangerously unpredictable and this may be further exacerbated by geometry to create what Lane termed a *"perfect"* combustion process.[115] This is common ground between the experts who agree this interaction makes attribution of the relative contribution of respective materials difficult[116] and makes modelling fire spread difficult.[117]

Reynobond PE 55

2.41. The PE had devastating consequences for vertical flame spread and horizontal flame spread around the crown, as outlined above. The experts concurred on the particular dangers posed by this product: Lane considered it *"contributed to the most rapid of the observed external fire spread"*.[118] Bisby noted that the reaction to fire of thermoplastic polymers, including PE, is well known and documented. Its behaviour cannot be considered surprising by any competent fire safety professional.[119] He considered the role of the PE particularly important; overshadowing the effect of the insulation.[120] Torero observed that the PE, being thermally thin, once ignited will spread fire at a much faster rate than PIR insulation.[121]

2.42. The aluminium skins provided no protection against the combustible product within, due to the extensive exposed PE edges,[122] the fact that PE melts at 130°C[123] resulting in the splitting of the aluminium,[124] and the aluminium will melt in typical flame heat.[125]

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[113] Lane [2.9.17] BLAS0000002_0016
[114] Bisby T/78/105/15-25
[115] See, for example, T79/62/12-21 (in relation to the ventilation gaps between rainscreen cladding panels) T79/71/3-9 (in relation to lateral spread) and T79/98/6-99/12 (emphasising the interaction between the cladding and insulation).
[116] See, in particular, T77/111/2-112/8 (in relation to the façade generally, but then focussed on the rainscreen cladding), T77/115/10-25 (in relation to the role of PIR), T77/82/7-19, T77/83/6-15, and T77/116/7-117/12 (in relation to the *"intricate geometry"* of the facade).
[117] Bisby T78/163/9-165/4 (and particularly the final paragraph of this passage) and T78/176/7-12.
[118] Lane [2.9.20] BLAS0000002_0016
[119] Bisby [431] LBYS0000001_0100 and T78/21/13-22/2
[120] Bisby T78/176/2-6
[121] Torero T77/125/4-10
[122] Bisby identified the location of these exposed edges in his oral evidence: T78/70-78
[123] Torero T77/132/9-10
[124] Torero T77/112/18-19
[125] Torero T77/112/12-17

PIR insulation

2.43. Types and Classification: Two types of PIR insulation were used on the façade: Celotex RS5000 (class D) and Kingspan Kooltherm K15 (no test evidence for relevant combustibility test[126]). Neither were anything approaching "limited combustibility", as they were required to be.

2.44. Role of PIR: While the experts were clear on the primacy of PE as a means for fire spread, the insulation *"clearly did have a contribution"*, but the extent is more difficult to measure.[127] The PIR performed a very effective supporting role to the PE. First because its mass was greater than the PE/any of the other combustibles, hence it represented a large amount of fuel and could burn for longer than other materials.[128] Second, combustion of PE and PIR is mutually supportive, through a process called "*radiative feedback*".[129] The PIR's insulating capability prevented heat loss and its release of combustible pyrolysis products, could assist acceleration of upward flame spread, albeit that PE was the main driver of upwards spread.[130]

2.45. In essence, whereas PE determines the speed at which the fire is propagating, the role of the PIR appears to at least "*keep… that area burning*",[131] if not also assisting with flame spread. While both products pose their own particular dangers, together the danger was amplified by their interaction.

2.46. Importance of insulation combustibility: Given the extent of the inferno that ensued, it may be suggested that as a matter of causation it was irrelevant whether the insulation was of *limited* combustibility or combustible to a greater degree, because it would have burned anyway. That argument overlooks a fundamental point: Torero's *"convergence of timescales"*. Had the insulation used been of limited combustibility, this would have reduced the *speed* with which it burned, particularly at the outset, potentially enabling LFB to extinguish the fire before it took hold in the façade and/or enabling occupants to

[126] It is stated to be classified as "Class 0" in the BBA certificate, but the tests standards applied for that classification are not those to be used for determining combustibility. See BLAS0000011_0056 at [11.14.9] and [11.14.10].
[127] Torero T77/126/17-127/23
[128] Torero T77/123/7-23
[129] PIR on its own will self-extinguish; it requires an external heat source to keep burning. The PE, which ignites and spreads easily, provides this heat and ignition source and supports the PIR burning. Once burning, the PIR will, by insulating the cavity, provide the conditions required for the PE to *continue* burning: Torero T77/123/24-126/16.
[130] Bisby T78/173/18-175/3
[131] Torero T77/125/19-22

evacuate in time. The particular properties and classification of materials, not merely the binary question of whether they are combustible or 'non-combustible', is important.

Lack of / defective cavity barriers

2.47. There were a number of defects in the way the Siderise cavity barriers were installed,[132] evidencing appalling workmanship. But that is a secondary issue to one of fundamentally flawed design: cavity barriers would never have assisted in a façade system of this nature.[133] They are unsuitable where (a) the outside of the duct or cavity is combustible, or (b) material enclosing the cavity (here, aluminium) is liable to deflect or distort in a fire, making it impossible to seal.[134]

2.48. Worse, in an illustration of the complexity of fire engineering in façade systems, cavity barriers could even have been a mechanism of downwards fire spread.[135]

Internal active and passive safety measures

2.49. The primary purpose of the internal safety measures was to limit the spread of smoke and fire spread from a single flat,[136] protecting the stair and lobby and the occupants of other flats. In the Grenfell Tower fire, they were required to operate beyond their design intent and mitigate the effects of an external fire on many floors.

2.50. The key measures, both passive and active, failed drastically, even when one considers that they were designed only to mitigate a fire on a single floor. The abject failure of the design of Grenfell Tower is evidenced by:

(1) The doors which failed to close/prevent smoke spread;
(2) The sheer perversity of a ventilation system which appears designed to suck smoke into the lobbies (the very thing it is designed to protect); and
(3) A lift which bore the hallmarks of a fire lift, but in fact was to all intents and purposes, an ordinary lift.

Doors

2.51. There is a strong correlation between internal smoke spread, particularly in lobbies and stairwells, and higher casualty numbers.[137] Given very large international fires have not

[132] Lane T79/149/5-152/23
[133] Torero T77/138/2-139/18, Bisby T78/204/9-17, Lane T79/142/8-143/15
[134] Lane T79/144/5-17, Torero T77/140/10-15
[135] Torero T77/139/11-14, Bisby T78/188/8-19, T78/189/23-190/5 and T78/204/9-17. Dr Lane acknowledged this as a possibility: T79/146/24-147/8.
[136] Lane [2.13.4-2.13.8] BLAS0000002_0024
[137] Torero T77/177/18-22

resulted in the same degree of smoke spread as experienced at Grenfell Tower, the degree of compartmentation achieved appears to have been instrumental.[138]

2.52. Compartmentation is not just an additional layer of redundancy, but a vital layer which introduces robustness.[139] Doors are *"particularly important"* because they perform two key functions:[140] preserving the means of escape and protecting occupants from fire/smoke spread from other flats, in both cases by preventing smoke/fire from leaving flats and entering lobbies/stairs.

2.53. When subjected to sustained high levels of heat such as a flashover, doors will eventually fail, but that does not diminish their vital role of providing occupants with much needed *time* to enable intervention by fire services, or evacuation.[141]

2.54. There is clear evidence that doors may have failed to provide the degree of compartmentation required,[142] since very significant smoke spread was experienced at a relatively early stage, including the possible movement of smoke through two compartments.[143]

2.55. Lane has assessed the flat doors and the stair doors.[144] As to flat doors:

(1) 14 flat doors were not replaced in 2011 (12 leaseholder, 2 tenanted).[145] These were all lost in the fire and Dr Lane is unaware of their specification. Their compliance with the applicable requirements cannot be confirmed.[146]

(2) 106 flat doors were replaced in 2011 with Masterdor Suredors. 58 were unglazed and 48 had a glazed section. Lane finds these did not comply with ADB 2010,[147] particularly:

(i) 30 minutes integrity (no penetration by flame/hot smoke) was not demonstrated because the 106 doors were not tested for 30 minutes integrity from *both* sides, as required.[148]

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[138] Torero T77/178/3-25
[139] Redundancies explained by Torero at T77/11/14-12/14 and the importance of compartmentation at T77/96/9-23.
[140] Dr Lane emphasised this in her oral evidence: T81/5/17-7/1.
[141] Torero T77/179/10-180/3
[142] Whether due to the doors inadequacies as found by Lane or through human intervention.
[143] Torero addendum JTOS0000002_0001
[144] Appendix I to her Supplemental Report: BLAS0000030.
[145] Lane [I4.5.11] and [I4.7.2] BLAS00000030_0039 and _0063
[146] Lane [I4.7.13] BLAS00000030_0064
[147] The requirements are summarised in Lane's table I.3 BLAS0000030_0036. Dr Lane has not considered whether this offends the non-worsening principle in Regulation 4(3) of the BR 2010, given that the original specification of the doors, and their compliance, is unknown.
[148] Lane [I4.5.27] BLAS0000030_0041 and T81/20/19-23

(ii) The test specimen differed substantially from those installed. Different glazing was installed in the glazed sample and different hardware was installed.[149] None were supplied with intumescent strips, in accordance with test evidence.[150] These are differences that affect performance.[151]

(3) Self-closers are *"incredibly important"*.[152] Lane identifies a systemic problem of malfunctioning self-closing devices. The evidence suggests an alarming number of doors where there was a failure to replace/repair self-closing devices.[153]

2.56. Stair doors had two important roles: to protect means of escape and to enable firefighters to carry out their work.[154] As to these:

(1) British Standard Fire Check Doors ('FCD') were installed rather than the Type 2 fire doors required by CP3 1971. FCD provide only 20 minutes integrity (rather than 30 minutes required of Type 2 fire doors) and only if tolerances of fit were controlled to less than 1.5mm.

(2) Lane is unable to determine the extent to which FCD have been upgraded with intumescent seals since installation. Pile brush seals have been found, but it is unclear whether these are simply draft excluders, cold smoke seals, or combined cold smoke and intumescent seals.

(3) Fire Risk Assessments carried out in 2016 identified instances of self-closing devices on stair doors not functioning. Lane notes that she has not seen any evidence that these issues were resolved prior to the fire.[155]

2.57. The precise reasons why smoke spread so rapidly and successfully, including the contribution of doors and the reasons why doors were open, will require further examination in Phase 2.[156]

Smoke extract system

2.58. The smoke ventilation system was only designed to work on one floor, and therefore any failure on the night might seem of limited relevance, given the scale of the fire. It seems clear however from Dr Lane's work that the system as designed was fundamentally

[149] T81/23/16-26/12
[150] Lane [I4.5.108] BLAS0000030_0059
[151] Lane [I4.5.28] BLAS0000030_0041
[152] Lane T81/38/11-18
[153] Lane BLAS0000030_0048- 0055
[154] Lane T81/41/11-19
[155] BLAS0000030_0100-101
[156] Lane T81/32/15-21, Torero T77/175/9-176/22

flawed, such that it caused smoke to be sucked into the lobbies. Torero agrees that if a smoke management system malfunctions smoke might spread where it should not.[157]

2.59. Lane has not yet reached a conclusion on whether this system was compliant but will do so in Phase 2.[158] She accepts she does not yet know whether the system as refurbished constitutes a material alteration (i.e. whether it was worse than the original system, itself non-compliant with the then applicable code CP3 1971), nor how the designers intended to achieve compliance (the system need not comply with ADB 2013 if compliance with the functional requirement could be proven). The summary below is merely to highlight the severity of the design flaw which appears to exist, and may have actively caused smoke spread, together with other deficiencies in accessories to the system.

2.60. The ventilation system as refurbished re-utilised the existing north and south shafts but new fans and dampers to seal the shafts when operating in smoke mode were added. The system appears to have been designed as a class B pressure differential system (a form of mechanical system) prescribed by BS EN1201-6:2005. A class B system is designed to protect the firefighting lobby and stair and therefore must assume a flat door and stair door on that floor and a stair door on the floor below is open. This design however assumed that only the stair door was open.[159] The system was a depressurisation system which should have ensured that smoke was extracted from the flats and that when the flat door was open, the air from the lobbies was pulled into the fire flats to avoid smoke penetrating the lobbies. In fact, it appears the design would pull smoke from the flats into the lobbies.[160]

2.61. Smoke dampers: These were series 54 dampers made by Gilberts but which had been tested from the closed position whereas the whole point of testing is the time it takes them to close (if they do not close within a specified time they fail the test).[161] Furthermore, the dampers were not in fact connected to the Human Machine Interface control panel, so firefighters could not tell whether dampers were open or closed on any given floor if they tried to override the system.[162] When asked how she knew this Lane

[157] T77/192/19-193/7: "*… if you change the equilibrium of the systems smoke might end up going in all the wrong directions. So I think there is a real reason to look into the space….*"
[158] T81/149/4-150/6
[159] T81/152/9-21 and 153/16-21
[160] T81/141/15- 144/22 and see BLAS0000038_0002-4
[161] T81/164/3-23
[162] Lane [J9.4.10] BLAS0000031_0141

said: *" Because the wires are bundled and were tied together"*.[163] Again this is evidence of an appalling lack of care.

2.62. Smoke shafts: These appeared not to have been properly rendered and as such are unlikely to have offered the two hour fire protection required as an extension of the lobby. This may be highly relevant to the smoke spread in lobbies which appeared to emanate from ducts.[164]

The lift, masquerading as a fire lift

2.63. The lifts were replaced in 2005, at which time the provision of firefighting shafts with "firefighting lifts" was required by ADB 2000 in buildings over 18m high.[165]

2.64. The more stringent requirements of "firefighting lifts", as compared with "fire lifts" (which were required CP3 1971[166]) is best illustrated by a comparison of Dr Lane's Figs. L.1 and L.2.[167] Significantly, only a *firefighting* lift could be used for evacuation.[168] *Fire* lifts do not have the right emergency power sources and protection measures to transport people, including those with mobility problems, around the building.[169]

2.65. Despite this, the lifts were not upgraded to firefighting lifts; they merely *masqueraded* as fire lifts because neither of the two fire fighter override switches[170] (one on ground, one on level 2) functioned on the night,[171] and Lane has found no evidence that the lifts were ever connected to fire control switches in 2005.[172]

2.66. Lane does not make a conclusive finding of non-compliance of the lift as she cannot be sure whether the designers had intended an alternative mode of compliance.[173] Her provisional view given the failure to provide firefighting lifts in accordance with ADB 2000, is that Functional Requirement B5 was not met.

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[163] T81/179/1
[164] T81/168/19-172/21
[165] Section 17.2 of Approved Document B 2000. KCTMO's own policy was to upgrade lifts to firefighting lifts. TMO000830598 and Lane [L.4.3.14] BLAS0000033_0028.
[166] Lane [I.2.3] BLAS0000033_0009
[167] BLAS0000033_0007 and _0010
[168] ADB 2000, section 5.39
[169] Lane T81/122/20-123/11
[170] Lane [L2.3.2.] BLAS0000033_0009
[171] The ground floor switch did not function on the night; lift remained in general operation. WSP investigation afterwards found it to be deformed and damaged: Lane T81/117/17-118/15. The level 2 switch was not connected and there was no signage indicating this was the case: Lane T81/117/6-16.
[172] The Butler & Young specification did not specify the provision of a fireman's control switch to any specific code or guidance: T81/111/5-22 and Lane [L4.2.27] BLAS0000033_0025. The Apex scope of works does not contain any evidence that a fireman's switch was provided at Grenfell: Lane [L4.2.20-L4.2.23] BLAS0000033_0024. Dr Lane has seen no evidence that both lifts were connected to the fire control switch at ground or level 2: Lane [L4.2.28] BLAS0000033_0025.
[173] Lane section H5 BLAS0000029_0060 and Table 16.3 BLAS0000016_0043-44

[C] TOXIC SMOKE: CONDITIONS GENERATED BY THE BURNING OF THE POLYMERIC CONSTRUCTION MATERIALS/FLAT CONTENTS

Irritant and asphyxiant gases likely to have been produced

2.67. As Purser stressed, his analysis is necessarily purely indicative at this stage.[174] There is limited data from the fire, beyond the fact of the fatalities, including the toxicology records from 15 of them,[175] all of whom showed high levels of COHb (evidencing inhalation of carbon monoxide ('CO')). Purser considers they are likely to have died from toxic gases as opposed to burns. Two people who may have fallen also showed COHb levels indicating *"they had a significant dose"* of CO and *"quite significant smoke"* exposure over a long period.[176]

2.68. Purser identifies three fuel packages of interest[177] based on generic (not actual Grenfell) polymer materials: (a) cladding (PE and PIR insulation), (b) window internal and external surrounds (including expanded polystyrene infill panels and uPVC), and (c) flat contents.

2.69. He has calculated the mass of such products around/in a two-bedroomed flat,[178] based on known quantities, estimated the amount of that mass which was burned and made an assumption he considers conservative, that only 5% of the products of that burned mass entered the flats[179]. Purser then applies known product data[180] to calculate the yields of asphyxiant gases CO and Hydrogen Cyanide ('HCN') likely to be produced, and uses known smoke density data to assess visibility.

Impact on those remaining in flats[181]

2.70. Purser's suggested sequence[182] suggests slow minor infiltration of smoke from the exterior smoke plume on the east face, derived from the exterior cladding and polystyrene infill panels. PE (given that it burned in well ventilated conditions) did not produce

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[174] Purser T84/107/10-12. Purser has relied on previous experiments, his experience and data for product toxic gas yields.
[175] Purser presentation DAPR0000004_0024, which data will not be subject to change: T84/104/9-11.
[176] T84/104/24-105/4
[177] T84/109/23-110/18
[178] Since most took refuge in such flats; see table 2 DAPR0000001_0063 for the estimated masses of the fuel packages.
[179] Table 5 DAPR0000001_0074 and T84/120/11-122/19
[180] From tube furnace testing see table 4 DAPR0000001_0069 and T84/138/4-140/5
[181] The times given in this section are, of course, tentative. It is important to note that the calculation of yield is a snapshot in time at the moment the fire enters a given flat, rather than a constant state around the building, and that Purser considers 5-7kg (a third to a half armchair) of a combusted material sufficient to generate a toxic atmosphere in a flat.
[182] [273] DAPR0000001_0078

sufficient CO to be toxic in this case, but would generate dense smoke (0.25m visibility; hand in front of your face) in the flat, and, by inference, the lobby.[183]

2.71. Rapid penetration, via voids and cavities around windows, of dense toxic smoke followed by flame from the fire involving the exterior PIR materials. The PIR would have burned in under-ventilated conditions, under which it would produce greater quantities of CO and HCN and result in loss of consciousness after 23 minutes.[184]

2.72. The uPVC window surrounds would have yielded sufficient CO and HCN to render a person unconscious within 13 minutes.[185] This sequence leads Purser to conclude that the toxic gases penetrating a flat in the minutes before the contents becomes involved are sufficient to present a *substantial hazard*.[186] In principle one imagines a not dissimilar scenario would apply to all fire break-ins, not just those on the initial flat no. 6 fires.

Impact on escape

2.73. A person's exposure to toxic gases in a flat builds over time and may have resulted in either collapse due to gradual exposure over time,[187] or collapse is triggered once the person engaged in activity, such as trying to escape.

2.74. Even if a person has managed to protect themselves from smoke inhalation by being in a fire-free flat and avoiding incoming smoke, there was a real likelihood of a person not wishing to enter the lobby due to dense smoke. It is well established that people will not usually enter smoke with a visibility of 3m. Even if smoke is not toxic at all, it influences behaviour and determines whether people live or die in a fire.[188]

2.75. Purser's view is that the lobbies were beginning to fill with smoke at 01.30 derived from the cladding materials and uPVC from the number 6 flats.[189]

2.76. In Phase 1, given the different timings at which fires started, Purser is not in a position to know what the conditions in the stairs were and when: his feeling that by 2am the stairs became influenced predominantly by smoke from flat contents was in relation to the early

[183] T84/123/11-21
[184] In part due to the halogen content of PIR which results in combustion inefficiency: T84/124/6-13
[185] See footnote 103 above
[186] [273(c)] DAPR0000001_0079
[187] Purser [277] DAPR0000001_0080
[188] T84/10/3-9
[189] T84/126/7-11

fires in the no. 6 flats[190], but of course flat fires may have begun internally as early as 1.36,[191] and so this issue is under review for Phase 2.

2.77. Even though Purser's evidence is necessarily tentative at this stage, it is rooted in data which he is applying in a conservative manner. It is reasonable to conclude, especially given the fatalities, that the conditions in flats, lobbies and stairs were highly toxic, and that at least during the first few minutes of each flat fire, toxicity was driven by the materials from the cladding and window surrounds.

[D] CONCLUSION

2.78. The façade, which included the crown, patently did not adequately resist, and on the contrary promoted, flame spread and so was in breach of the BRs. Key active and passive measures within the Tower – doors and lifts – were built in breach of the BRs. The façade including its crown, lack of cavity barriers around the windows (which could have prevented initial escape), doors and lift are all contributors to the scale of the disaster and therefore to lives lost.

2.79. Had the Tower been constructed in accordance with the relevant BRs, the purpose of which is *to preserve the health and welfare of those in and about buildings or who may be affected by them*[192] it is difficult to see how a fire of this magnitude, causing 72 deaths, would have occurred.

2.80. Findings sought. G4 seek the following findings regarding the building at Phase 1:

(1) The façade was a material alteration,[193] such that the BRs applied. Neither the façade, nor its component parts, adequately resisted the spread of fire over the walls. On the contrary, they promoted it. Accordingly, they were not compliant with Functional Requirement B4(1) and B3(4) of the BRs.[194]

(2) The alteration to the window of Flat 16 (and all other windows) was a material alteration. Due to the lack of cavity barriers around the windows, they were non-compliant with Functional Requirement B3(4). This facilitated the escape of the fire

[190] T84/128/16-130/12
[191] T84/174/20-181/22
[192] Section 1, Building Act 1984
[193] BRs, regulation 3(1)(c), applying the definition in regulation 3(2), either on the basis that it no longer complied with the requirement where it previously did (regulation 3(2)(a))
[194] There is a distinction to be drawn between the Chairman construing the BR 2010, which is a question of law, and construing ADB, which is not a creature of statute and on which the evidence of those routinely using it might be required. See *Worlock v SAWS and Rushmoor Borough Council* (1982) 22 BLR 66 and *May-Lean & Co. Limited v The Gas and Electricity Markets Authority* [2017] EWHC 2307 (Admin) at [24].

into the cladding from Flat 16 and multiple instances of fire re-entry at other windows.

2.83. At Phase 2, the Inquiry will of course investigate attribution of responsibility for these failures, and other acts and omissions which caused the refurbished Grenfell Tower to be so fatal to its occupants.

3. THE RESPONSE

[A] POLICY, TRAINING AND PLANNING

3.1. The evidence that the LFB failed to adequately plan and train for a fire like the one at Grenfell is overwhelming. On paper the LFB had embraced the need to do so, but it manifestly failed to do so in practice. The national guidance – introduced in response to Health and Safety Executive Improvement Notices and in the aftermath of the Lakanal House inquest recommendations – was contained in Generic Risk Assessment 3.2 *Fighting Fires in High Rise Buildings* ('GRA 3.2').[195] According to Assistant Commission Roe, the LFB played a "*leading*" role in its drafting. However, the cascading down of GRA 3.2 to London station management, even as an awareness tool, was non-existent and the Commissioner had not even read it before the fire.[196]

3.2. The LFB adopted its own Policy 633 on *High rise firefighting*.[197] There are some differences in content and emphasis between GRA 3.2 and Policy 633 – notably specific reference to the risks of cladding in the former[198] but not the latter – but what both polices had in common was: (a) recognition that combustible material and modern building construction methods posed a risk to compartmentation and were therefore relevant to operational planning and tactics;[199] (b) a clear warning that fires which broke out of their flats of origin and developed externally could lead to rapid spread to other compartments and floors;[200] (c) recognition that the viability of any stay put policy is dependent on the

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[195] LFB00001255 DCLG and CFOA, Feb 2014
[196] She characterised it only as source material for her policy department: T50/32/9-33/22.
[197] LFB00001256. Issued 26 November 2008, and amended on 1 June 2015 to reflect GRA 3.2: _0028
[198] Familiarisation to "*... include... cladding systems*" (_0018). Cf. Policy 633 App. 1 – 7(2)(d) reference to "*building construction features which may promote rapid or abnormal firespread, such as sandwich panels...*"(_0019).
[199] GRA 3.2 _0010 and _0032: "*Combustible material ... and poor quality construction can ... contribute to the spread of fire and smoke beyond the compartment of origin*" and "*... some designs of plastic or aluminium window frames/panels can be the subject to early failure, promoting fire growth and vertical and horizontal fire spread*". Policy 633 _0016 [7.66] requiring specific consideration to "*... the impact of building materials ... on fire spread; for example PVC window frames ... subject to early failure*", and App. 1 – 7(2)(d) _0019 (extracted in footnote 198 above).
[200] GRA 3.2 _0011 and _0032: warning of fires breaking out of compartments and developing externally, "*lead[ing] to rapid spread to other compartments and floors*" and that "*Early unexpected failure, or non-existence, of internal compartmentation within a flat can cause a fire to be far bigger than normally planned*

maintenance of compartmentation, albeit this is far less clear in Policy 633 and neither policy provides any further specific guidance on the circumstances in which stay put should be departed from;[201] (d) a mandatory requirement for incident command to be sufficiently competent to assess the impact of a fire on compartmentation and to determine the need for and execute a partial or full evacuation if departure from stay put advice was necessary;[202] and (e) stipulation that operational readiness required planning through familiarisation visits to high rise buildings, recording of key information on relevant risks,[203] and the practice of high rise training as a specialist skill, including "*safe rescue*".[204]

3.3. Well before June 2017, the LFB had therefore clearly registered the prospect of a high rise fire involving breach of compartmentation as a risk to be prepared for, including specifically as a result of flammable external facades. The LFB's focus, following the recommendations of the Lakanal House Coroner in 2013, was on the need to develop training "*to anticipate that a fire might behave in a manner inconsistent with the compartmentation principle*",[205] to "*review existing policy related to information gathering and contingency plans*" and "*to create an inspection regime targeted at high priority buildings*".[206] The revised GRA 3.2 and Policy 633 in 2015 were an attempt to learn the lessons of Lakanal House, including regarding hazardous building materials not unique to Lakanal.[207] Following the Shepherd's Court fire in August 2016, a slide show entitled *LFB Tall Building Facades* was produced by the Fire Engineering Department which explained the risks of break out and re-entry during a cladding fire with reference to a standard diagram from BRE 135.[208] RBKC (and other councils) was warned by the

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for". Policy 633 _0003 [2.18]: "*Fire spread … more commonly occurs externally when fire breaks out of windows… [and] may lead to rapid spread to other compartments and floors*".

[201] GRA 3.2 _0011: stay put policy "*based on the concept of secure compartmentation*". Policy 633 does not contain this statement but recognises the increased risks from breach of compartmentation: see [7.50] _0014 but also [7.63] _0016).

[202] GRA 3.2 _0022: Incident Commanders to "*understand when a partial or full evacuation strategy might become necessary in a residential building where a Stay Put policy is normally in place*" . Policy 633 _0014 [7.20]: Incident Commanders to "*consider… whether it [was] necessary to undertake a partial or full evacuation in a residential building where a "Stay put" policy is normally in place*".

[203] GRA _0016-18. Policy 633 _0019 App. 1. Hazards identified were to be included in both the operational risk database (ORD) for high rise buildings and premises risk assessments (PRA) in accordance with Policy 800 *Management of Operational Risk Information*: [4.1] LFB00000705_0004.

[204] Policy 633 _0007 [4.8] requiring tactics to be "*assessed, practiced, and confirmed where necessary for the building concerned*", with specific reference at [4.8(a)] to "*planning for fire spread beyond the compartment of origin*".

[205] LFB00003751_0003: column 1 item 3(3)

[206] LFB00003751_0001: column 2 item 2(a)

[207] See LFEPA characterisation of the revised GRA 3.2 to the Post Lakanal Working Group: LFB00000207_0008 (specifically referring to "*the potential for rapid failure of lightweight (UPVC) wall panels and for fires to spread laterally and vertically in a downwards direction*").

[208] LFB00003521

LFB in April 2017 that cladding panels may not be achieving the levels expected for conformity with the BRs and, specifically that, "*On testing it was found that panels may deform or delaminate exposing any combustible core…resulting in the panel becoming involved in the fire and allowing the fire to spread and enter flats other than the flat of origin.*"[209]

3.4. This state of corporate knowledge gives rise to extensive criticisms and future issues for interim recommendations and Phase 2. At this stage, five conclusions are sought as inescapable on the Phase 1 evidence. First, this knowledge had not filtered down to station level through basic, update or even specialist operational training. No Phase 1 firefighter witness could recall being specifically trained about the risks of external cladding fires, the revision of a stay put policy, or what to do in the event of failure of compartmentation in a high rise building. Second, despite the foregoing policies contemplating partial or full evacuation of a high rise building, the Inquiry has received no evidence of any doctrine or training on this, and no witness was able to give any operational insight into how to achieve it beyond *ad hoc* door-to-door deployments. Third, the first firefighting responders gave evidence that demonstrated a drastic failure to appreciate the breach of compartmentation occurring before their eyes (and being relayed to the control room in real time by residents experiencing smoke and fire entering their and their neighbours' homes). They failed to comprehend that immediate evacuation was the only option and that entire building failure was inevitable. Fourth, certain senior personnel (including the second and third Incident Commanders) who arrived before 2am continued to mischaracterise the nature of the fire despite the now obvious risk of mass fatality. Fifth, before the fire, Grenfell was a chronically under-assessed building.

3.5. Not disputing much of the above, the Commissioner's explanation was that "*although the risk was on the LFB's corporate radar*" in the months before June 2017, the fire at Grenfell Tower was beyond what any conceivable training or policy could effectively anticipate, or respond to.[210] She categorised the *Tall Building Facades* slide show as of exclusive interest to her fire engineering department. The exchange with CTI memorably culminated in the woefully ill-judged and defensive statement that she "*wouldn't develop a training package for the space shuttle to land on the Shard*".[211] In her eyes, Grenfell was beyond planning.

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[209] LFB00000085
[210] T50/53/13
[211] T50/47/20-51/11

3.6. A further sign that the LFB was not ready for the fire can be found in the risk assessments carried out by North Kensington fire station. The introduction of cladding onto Grenfell produced no enquiry by any LFB personnel at all, at any time. As to the ORD,[212] the floor numbers were left at 20 and the consequences for numbering was not reflected. The floor plans and other basic content for a Premises Information Box were requested and documented for follow up but never pursued.[213] The emergency contacts remained long-gone Rydon employees. The fire lift had a keyhole that was rotting and had not been tested, even to see if the relevant key would work.[214] Risers that should have been wet were dry, and no one took issue with it.[215] The ventilation system was noted, but no details of how to use it were recorded despite a demonstration conducted in the presence of LFB officers.[216] Contrary to the requirements of Policy 800,[217] there was a manifest failure to ensure that intelligence arising from the risk assessments was reflected in the ORD.[218] None of Davis, Ricketts or Dowden had ever studied the PRA.[219] Davis, as Station Manager, had no knowledge of the LFEPA Notice of Fire Safety Deficiencies (dated 17 November 2016), which identified non-self-closing doors on individual flats and stairwell lobbies.[220]

3.7. The Commissioner accepted that the ORD was "*woefully inadequate*".[221] However, she sought to defend the failure (and to minimise its significance):[222] either the demands of familiarisation, planning and risk assessment were intellectually beyond frontline firefighters (despite ample policy to guide them), or there were too many premises to fully assess in reasonable time.[223] Neither of these excuses are to be found in the Action Plan response to Lakanal House. The existing policy promised to rise to both challenges and for good reason.

3.8. The Commissioner was an unimpressive witness, whose ill-judged comments brought her organisation into disrepute. The thrust of her evidence was to put the fire into a category

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[212] LFB00003116_0004
[213] LFB00003116_0004, Davis LFB00004829_0002, Ricketts LFB00004825_0005
[214] Ricketts LFB00004825_0005
[215] Ricketts LFB00004825_0004, Davis LFB00004825_0002
[216] Walton MET00005715_0003, Walton T46/69/13-71/12, Ricketts LFB00004825_0006, Dowden T9/115/23-116/5
[217] [4.1] LFB00000705_0004
[218] Compare the ORD building content (LFB00003596_0007-8) and the detail contained in the PRA (LFB00000144).
[219] Dowden T9/128/11-13, Ricketts T51/113/23-24, Davis T51/195/13-196/3
[220] TMO00832135_0005, Davis T51/156/25-157/17 (who doubted its relevance for ORD content)
[221] T50/93/4-5
[222] T50/95/20-100/7
[223] T50/80/19-87/6

beyond learning: attributable solely to its invidious construction, denying and helping to institutionalise a denial that any alternative response was possible. This led her to claim she would not change anything about the conduct of the Brigade on the night.[224] The comment was hurtful in the extreme to those who have suffered as a result of the organisation's failings (described as a "*slap in the face*" by one BSR witness[225]). It was hurtful to the BSR, not just because it was obviously insensitive, but because it bodes so badly for the LFB's capacity to make any real change in the future. She denied her organisation, and the people that it might have saved, even the benefit of her hindsight. Until this Inquiry disabuses the LFB leadership of these forms of denial, the bereaved of both Grenfell (and Lakanal House) are left without the comfort that failures on the night will not be repeated, or that future risk to life will go without prevention.

Implications at the fire ground

3.9. It follows from the above that WM Dowden commanded the first hour of the incident at Grenfell without proper training or understanding of a cladding fire or its implications.[226] Neither he, nor others, could conceive of a fire that jumped more than a floor or two.[227] The high rise training *he received* was predominantly delivered *by him* to his watch, limited to watch shifts, and grounded in theory, not practice, and without quality assurance.[228] The practical training that did occur, for instance the Hammersmith event in February 2016, did not train participants for anything beyond the realms of normal compartmentation fires, a small number of FSG calls, and lacked any evacuation training.[229] No other firefighter presented a markedly different account.[230] Peter Johnson, then a Command Unit Watch Manager from Islington, was an outlier. He developed a pilot training package outside the ordinary training system[231] with the aim "*to provide a realistic incident, the likes of which at that time in London we hadn't experienced, and to show that the policy may have had some deficiencies*".[232] The project did not go forward,[233] but the constructive criticism that inspired it was evident at Grenfell Tower.[234]

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[224] T50/236/8
[225] Oyewole T58/90/8-9
[226] Dowden T9/84/24- 86/3 and 91/18-22
[227] Dowden T10/120/12-21, O'Beirne T14/195/17-20, Secrett T17/29/25-30/1 and 39/20-23.
[228] Dowden T9/20/10-33/6, T9/57/24-58/20, T10/18/17-24/6
[229] Dowden T9/33/20-35/14, T9/67/22-69/9
[230] Egan T15/83/4-9, Goodall T35/72/23-8/18 and T35/10/7-12, O'Keeffe T17/130/12-131/8 and T17/138/3-12
[231] Johnson MET00013235_0005 and ex PMJ/7 (MET00017005)
[232] T36/219/18-21. Johnson's Pre-Grenfell assessment was "*the [then] policy needed to be amended and changed dramatically to ensure that if we did have anything over three of four [FSGs] we could adequately deal with it*": T36/234/7-11.
[233]Johnson MET00013235_0005 and T36/231/5-21
[234] Johnson T36/204/7-12

[B] AN OVERVIEW OF THE ERRORS OF THE FIREGROUND

The initial response: looking without seeing and hearing without listening

3.10. Without proper training or practice, Dowden and others approached the fire based solely on past experience, which doomed them to error. They could only use their available rules of thumb (or what psychologists call *heuristics*[235]) to exercise judgment. Heuristics are essential for navigating a norm, but they can become counter-productive in the face of the unfamiliar.[236] The aim of emergency response must be to instil heuristics, but to stipulate departure in the face of novel situations.[237] That is critical because large scale fire is highly dynamic. The Incident Command at Grenfell involved a combination of a failure to apply a fundamental heuristic concerning compartmentation (that breach of compartmentation undermined the ordinary defend in place firefighting strategy and stay put advice) and complete absence of any alternative heuristic for the situation (such as systematic evacuation). Like many firefighters on the night, Dowden's predicament in real time became one of *looking* at the fire *without seeing* it, and *hearing* communications on the radio *without listening* to them.

3.11. As to looking without seeing, Dowden did not register that an evidently substantial external fire of this ferocity would have inevitable implications for breach of compartmentation across the building.[238] His actions indicate more than he was ultimately willing or able to concede in evidence. At 01.12 he asked for the covering jet to be put on the exterior because he saw there was a real risk of the fire breaching out of the compartment window.[239] At 01.13, he ordered the hydraulic platform. He made pumps 6 before 01.14, and he made pumps 8 at 01.19. The increase was based on his visual recognition that the fire had broken out of the compartment.[240] By 01.26, he made pumps 10, because O'Keefe had told him to do so, based on internal events, and at 01.28 he made pumps 15, requested Ariel x 2 and declared 'Persons reported',[241] as the fire was "*half way*

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[235] The idea originates from the work of Amos Tversky and Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, Science vol. 185, 1974.
[236] Neutrally speaking a heuristic is a bias that comprehends events in a pre-conditioned way. Daniel Kahneman, *Thinking, Fast and Slow* (Penguin, 2012, p.98) provides a technical definition of heuristic, "*a simple procedure that helps find adequate, though often imperfect, answers to difficult questions*".
[237] For the dangers of the availability heuristic, see Brian Toft and Simon Reynolds, *Learning from Disasters, a management approach* (Palgrave, 3rd ed. 2005) Ch. 1, pp.1-11.
[238] For a detailed description of the information available to Dowden, see especially submissions on behalf of BSR instructing Bishop Lloyd Jackson and Oliver Fisher.
[239] T10/87/1-6
[240] Dowden T10/137/22-25, 138/24-25 and 139/5-23
[241] MET00013830_0017-18. The PRC briefing notes indicate that Dowden *"was really concerned – fire spread up building and people coming out. This was a pivotal change – Multiple residents leaving. Spread up outside. All my previous experience now gone out the window. Very density[?] moment. I felt helpless …well outside comfort zone* (LFB00003117_0006-7).

up the building and now getting into flats".[242] What he saw and what he did reflected breach of compartmentation; yet neither translated into full evacuation.

3.12. As to hearing without listening, Dowden was quickly informed that the smoke and fire had spread internally across the building, at floors 5 to 7, and then on 16. This reflected what residents were repeatedly telling the control room (see section 3[C] below). Very little of this seemed to register.[243] This was a situation where audio and visual information could be overwhelming, but that is why individual human judgement alone cannot command the response to major fires: there needs to be procedure and method applied to complex, evolving facts. Dowden's training and experience prevented him from appreciating that what he was seeing and hearing demanded only one thing: evacuation. The available conceptual anchor of Fire Survival Guidance ('FSG') was fatally unhelpful. It suggested individual deployments to rescue particular occupants as the need arose,[244] rather than assisting occupants to escape by themselves or instigating a full-scale evacuation.

Full evacuation was viable, but beyond LFB contemplation

3.13. The failure to call an end to stay put appears rooted in the absence of knowledge, training or practice of a different approach.[245] Experts will review this issue in Phase 2, but as a matter of fact, the stairwell remained tolerably free of smoke before 01.30, and indeed for some time after this. The experts confirm what the BSR made clear: that before 02.00 the means of exiting the building had not been so badly compromised that people could not get out. Even when most lobbies were filling up with dense smoke, the staircases remained viable for 31 people who escaped from 01.31 to 01.47.[246] Professor Purser identified on a calculation of simultaneous entry into the staircase of a cohort of 293 people across 23 storeys, a nominal total exit time of seven minutes.[247]

3.14. The evidence points to what is no more than common sense for anyone informed about the evidence in the case, and having visited or lived in the building. Full evacuation was indeed viable and the only reasonable option in the face of imminent risk to life. From 01.15 the Incident Command ought to have confronted the clear dangers to occupants if they were to remain in a building doomed to become increasingly less viable as time went on.

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[242] PRC notes: LFB00003117_0007
[243] MET000019015_0006, T10/168/12-24 - 169/11
[244] See definition in LFB Policy 790 *Fire Survival Guidance Calls*, February 2012, LFB00001257_0002 [2.1]
[245] Cotton MET00012492_0038: "*It's all very well saying "Get everybody out" but then how do you get them out?"*
[246] Purser T84/104/3-5. Examples include Petra Doulova and her partner descending from the 20th floor at 01.42 (IWS00000835 [71-76], T59/44/16-47/7), and Branislav Lukic (carrying Clarita Ghavmi over his shoulder) from the 11th floor at 01.47, with firefighters passing on their way up (IWS00000770 [38-40], T59/44/16-46/7).
[247] Purser DAPR0000001_00083-85 [295-305], DAPR000004_0004-7, Purser T84/79-80/3

Evacuation should have been instigated by sending fire fighters to the top of the building and immediately changing the control room advice. Loudhailers could have been used in the stairwell. The intercom system could have at least been used to wake people up. The ensuing evacuation would not have involved a crowd of strangers in a public place, but neighbours navigating the stairs of their own home.

3.15. Even after 02.00 there was never a point when it was impossible to descend the staircase without breathing apparatus.[248] Everything depended on maintaining and optimising the staircase. The repeated failure of single BA teams to make it up and down meant that only a coordinated system could succeed. Without such coordination there could also be no basis for the control room to advise and reassure trapped occupants that they would be met by firefighters in the stairs. The failures of the bridgehead throughout the night of the fire are that it focussed only on ad hoc rescue, and never on facilitating escape in a systematic way.

The failures of the bridgehead

3.16. What the bridgehead required was a basic method to optimise use of the single stairwell for evacuation. Rather than systematically moving at speed to coordinate evacuation from the top down, it deluged the stairwell with firefighters and equipment. In WM O'Keeffe's words, the plan was "*to flood*" the building "*with BA and then firefighting equipment and then get hold of it. That's what we do*". For him, an evacuation "*of sorts*" was taking place from the outset, but he also characterised this as *"rescue, multiple rescues*".[249] Other BSR submissions will detail this issue, but the G4 draw attention to four concerning features of the bridgehead during this operation.

3.17. First, it never aimed for anything other than individual rescues prompted by FSG calls. As with the outside command, O'Keeffe (as the bridgehead commander until it moved to lobby after 03.00) did not register and act on the significant early evidence of failure of compartmentation. He certainly provided Dowden with the necessary information concerning the need for a *rescue* operation but had in mind and executed a series of individualised deployments which could never realistically achieve the necessary, rapid, full building evacuation.[250] An increasingly fundamental problem with this ad hoc approach to rescue was that deployed crews were forced to divert to assist casualties that

[248] Purser T84/104/3-5. See further para 3.21 below.
[249] O'Keeffe T18/40/16 and 42/9-10
[250] O'Keeffe MET0001397_0007-8, MET00005284_0002-3 and T18/44/13-18

they encountered on the staircase, leading them to abandon their rescue missions.[251] A structured system that anticipated residents self-evacuating down the stairs (such as a rotation of BA wearers specifically stationed to receive and shepherd down residents) would have avoided this pitfall.

3.18. Second, the bridgehead was starved of timely information.[252] There is one example of delay that stands out. Mariem Elgwahry and Naomi Li both called the control room at 01.30 to tell them there was fire on the 22nd floor[253] and the 22nd floor was immediately mentioned in a service request at 01.32.[254] The 23rd floor (where Mariem and her mother, Eslah, had now moved to) was communicated in the telephone conversation between OM Norman and one of the CU staff, either WM Meyrick or WM Kentfield, at 01.35.[255] The first known FSG list at the fire ground contained Flat 195 on the 22nd floor and Flats 205 and 204 on the 23rd floor. [256] Yet, despite the red flagging of these flats and floors, there were no FSG deployments to floor 23 until 02.08,[257] and then no further deployments until 02.24[258] and 02.51.[259] Even worse, for a fire that was reported to have broken out on the 22nd floor at 01.30, no one was deployed to the 22nd floor until 03.03, shortly before Naomi Li and Lydia Liao began their escape.[260] No firefighter ever actually reached the 23rd floor, and although Dean Roberts did reach the 22nd (see below), he searched neither the lobby nor the flats. The fire on those two floors alone claimed the lives of 36 people, half the number of all the deceased.

3.19. Third, scarce resources to respond to FSG were wasted. (a) Badillo, Secrett and Dorgu went to the 20th floor at 01.33[261] in a well-motivated but doomed mission of their own to rescue Jessica Urbano Ramirez, ignorant of the knowledge that she had already told the control room that she was on the 23rd floor.[262] None of the firefighters refer to closing the

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[251] For examples of different forms of diverted deployment, see Warnsby MET000083336, Codd MET00010089, Upton MET00007524, Hoare MET00008027, Bloxham MET000108, Bell MET00012995
[252] See especially submissions on behalf of BSR instructing Bishop Lloyd Jackson and Oliver Fisher
[253] M. Elgwahry LFB00000310, Li LFB0000311
[254] MET00013830_0018
[255] INQ00000194
[256] MET00016967. As the list refers to 161 19th (10 persons) it can be timed after 01.47, after the fireground had been told of Lamprell's call which had been wrongly interpreted as 10 people trapped in Flat 161: T37/151/19-153/2 and INQ00000208_0002.
[257] Telemetry Sch. LFB00023326_0002 (Tally out), Wright MET000083339_0002, Bell MET00012995_0003, Alassad MET000012991_0003
[258] Telemetry Sch. LFB00023326_0002 (Tally out), Evans MET00010089_0007; Bloxham MET00010866_0003
[259] Telemetry Sch. LFB00023326_0002 (Tally out), Pole MET00005540_0001, Cheesman MET00005485_0001, Mitchell MET00005483_0001, Bate MET000017072_0005
[260] Telemetry Sch. LFB00023326_0002 (Tally out), Codd MET00012539_0004
[261] Telemetry Sch. LFB00023326_0001 (Tally out)
[262] LFB00000507_0002

door to Flat 176, which was now consumed in smoke.[263] They ended up neither notifying, nor bringing down any other families that could have been saved from that floor or above. (b) The Paddington FRU team – the first specialist EDBA rescue unit to attend the scene – was sent on a hopeless mission to the roof at 01.56 to sling ropes over the top of it to try and spray water down the side.[264] They saved Fadumo Ahmed's life; significantly, they were able to operate at the highest floors, and had they been deployed in a coordinated relay, without the extra weight of unnecessary equipment,[265] it is probable that they could have done much more. (c) Most inexplicable of all was the delay in deploying available EDBA, which no one in command truly seemed to grasp, despite an early consensus on the obvious importance of EDBA to making rescues from the higher floors.[266] The first EDBA crews state that they became involved in logistical tasks outside the building for extended periods rather than being urgently deployed to the higher floors.[267]

3.20. Fourth, neither the bridgehead, nor the structure that was set up around it, ever proved capable of assessing the extent of success of its strategy. It was over-optimistic about what it was achieving. The majority of evacuations were either without any assistance, or only partially assisted towards the bottom of the stairs. The number of successful assisted evacuations directly from flats, or lobbies, throughout the night were few.[268] That of itself should have revised thinking. Deployed teams were also tragically mistaken to assume that it was safer to leave residents on floors once reached.

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[263] Badillo T13/155/9-160/10, Secrett T17/92/13-104/7, Dorgu T19/162/19-170/22

[264] Telemetry Sch. LFB00023326_0001 (Tally out). The order came from Dowden MET00010915_006, in consultation with SM Loft MET00007518_0003. See also Gillam MET00008025_0006. O'Keeffe knew that the operation was not viable: T18/102/23-106/4. Gallagher thought they could have died: MET00010083_0011, _0032.

[265] 4 or 5 bags of equipment: Roberts MET00007890_0004

[266] e.g. O'Keeffe T18/83/9-21 (describing telling GM Welch and WM Welch agreeing that all EDBA in London were required)

[267] The above Paddington team (A216) were Status 3 at 01.35, but did not tally out until 01.56; the Chelsea FRU team (G346) was status 3 at 01.47, but did not tally out until 02.44, 03.03 and 03.29; the Wimbledon team (H346) was status 3 at 02.42 but did not tally out until 03.31; and Mayne and Lunquist from Battersea (H276) were status 3 at 02.33, but they did not deploy until 03.22: see MET00013830_0008 and Telemetry Sch. LFB00023328_0002-3. The crews were variously tasked or involved themselves in gathering equipment for general use, assisting with setting up the Soho ALP and finding drinking water: Codd MET00005624_0001, Upton MET00007524_0004, Sime MET00010896_0004-6, Okoh MET000080593_0004, Rice MET00008038_0006 and Peacock MET00010079_0007. Prior to the bridgehead being moved to the ground floor, Mulholland recalled finding a group of 8 EBDA wearers outside the building "*standing there*": Mulholland MET00007865_0006 and T33/85/18-86/3.

[268] By G4 calculation, from only 12 flats and numbering 28 residents in total: Flat 9 [01.25], Flat 65 [02.19], Flat 175 [02.26] (two of the Balkadi children, only one of whom survived), Flat 165 [02.32], Flat 95 [02.41], Flat 113 [02.45] (leaving four out of eight), Flat 94 [03.07], Flat 82 [04.47], Flat 72 [06.05], and Flat 83 [08.07]. Ed Daffarn was found on the lobby of the 16th floor [01.35]. Fadumo Ahmed was rescued from the stairwell of the 20th floor [02:25]. All times denote exit times taken from the CCTV schedule, save for Flat 83, which is taken from viewing the CCTV exhibit.

3.21. In addition, the bridgehead did not learn from successes. For instance, fewer deployments, but with the benefit of spare BA masks and sets for use on residents, might have produced better results, like the evacuation of Sharon Laci and her daughter, which despite its success was inexplicably not replicated even as the conditions in the stairs worsened.[269] Equally, no one apparently registered the implications of significant numbers of self-evacuations after 03.00.[270] These survivors were not just young and fit adults.[271] None of these facts, nor the potential indicated by these escapes, seemed to register at the bridgehead.

3.22. Finally, there is no evidence to indicate that the Goldbourne system made things particularly better when deployments re-commenced at c.03.24 after the relocation of the bridgehead to the ground floor. Self-evacuations after that still far outnumbered the assisted ones. Phase 2 experts will need to consider the necessity of deploying BA resources (albeit SDBA) to the lower floors to protect access and egress by fighting fire and in order to facilitate EDBA wearers to push up into the building.[272] However, there is considerable evidence that under the direction of Goldbourne and Welch, a substantial number of EDBA crews were wastefully diverted to the lower floors instead of to FSG calls on higher floors. This included re-deployment of crews with FSG slips in their hands for those waiting to be rescued on higher floors. These were crucial missed opportunities, notably including for the remaining residents on floor 14.[273]

The absence of command

3.23. For much of the night, the incident had hierarchy but lacked command. The G4 emphasise six features of the situation. First, Dowden's failing was much more institutional than

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[269] Tillotson MET00080603_0005, Wolfenden MET00010831_0003, Gallagher MET00010083_006, Bettinson MET00007879, Walton MET00010828_0033, Aston-O'Donovan T32/101/8-108/2

[270] CCTV Schedule MET00016072_0041-46: Flat 153 [03.13], Flat 92 [03.20], Flat 193 [03.22] Flat 183 [03.38], Flat 133 [03.47] Flat 74 [04.13], and Flat 73 [04.20].

[271] Both Rabia Yahya and her 8 year old son suffered from asthma (IWS00000498_0007 [27] and T63/180/3-9). Mr and Mrs Macit were 56 and 57. They were neither young, fit, nor healthy, and in the latter case, suffered from mobility issues (IWS00000069 [6], [101], [105-123] and IWS00000904 [1], [79-85], T65/176/6-11). Ann Chance escaped with her 55 year old mother and 62 year old aunt (IWS00000783_0010 [69-70]). One child was lost on the staircase in the worst possible circumstances and an unborn child died, but 9 children (aged 3-12 years old) escaped between 03.00 and 04.00. Few were carried, and when they were, others were invariably less assisted.

[272] Goldbourne T47/192/17-24 and T47/208

[273] Sime and Okoh [Tallied out 03.27] initially given slip for FSG in Flat 73 by O'Keeffe but re-tasked by Goulbourne to fight fire on 5th floor: MET00010896_0006 and MET000080593_0006. Mayne and Lundquist [Tallied out 03.29] initially given a slip briefing them to go to Flat 113 but Goulbourne re-deployed them to the third and fourth floors to fight fire and search and rescue: MET00008033_0005-6. Harold and Peacock [Tallied out 3.31] re-deployed from a brief to reach the Ibrahim family in Flat 203 on the 23rd floor to search and rescue on the 5th and 6th floors: MET000010073_0003-4 and MET00010079_0007. Rice and Friend [Tallied out 03.32] initially handed a task to go to 14th floor but re-tasked to go as a crew of four to the 4th and 5th floor for search and rescue: MET00008038_0008.

personal. A Watch Manager was left for more than an hour, when by standard practice he ought to have been relieved by one of the two Station Manager mobilised following the escalation to 6 pumps at 01.12.[274] This command vulnerability was understood in real time, by Dowden himself,[275] by fire fighters who could see him buckling under pressure,[276] and by more senior officers who could not understand why he had been left in charge for so long.[277] Similar observations could be made of O'Keeffe. Even if more forceful in character, this was a lost first hour by both of them, not least because of the absence of training and practice to comprehend the fire, or to effect a systematic revision of the stay put policy.

3.24. Second, for all the criticism of Dowden failing to read the breach of compartmentation before 01.15, both SM Walton and DAC O'Loughlin failed in the same respect.[278] Both handovers concluded with neither senior officer appreciating that the fire had broken into individual flats and O'Loughlin professing a measure of confidence that this was unlikely to be a significant concern.[279] This misperception was in conflict with a range of firefighters who described obvious re-entry on multiple floors at the very same time.[280] The failure had repercussions beyond the firefighting response. A LAS Incident Response Officer, who arrived at 01.49, was told by a firefighter in a white helmet that the fire was believed to be external only, resulting in a LAS METHANE message at 01.59, which questioned whether the fire was "*superficial*", and delayed the declaration of the Major Incident until 02.25, with the result that the full 20 vehicle LAS pre-determined attendance did not arrive until after 03.00, some 1½ hours after the police declared a Major Incident, and an hour after the LFB had done so.[281]

3.25. Third, the lost first hour was compounded by the drift in decision making from Walton's arrival at 01.40 to Roe's assumption of command within the second hour. Walton and O'Loughlin had no idea that GM Welch had assumed command at CU8.[282] A Major

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[274] LFB00024348_0022
[275] Dowden MET000019015_0007-8. See also the PRC meeting notes: LFB00003117_0007.
[276] Batterbee MET00012871_0010, Alan Moore MET00010819_0005, Gregory MET00012877_0008
[277] O'Loughlin MET00012563_009
[278] Walton arrived at 01.40: MET00013830_0013. He began a handover, which O'Loughlin joined at about 01.55: MET00012563_0007.
[279] Walton MET00010828_0027, O'Loughlin MET00012563_0008 and 11. Dowden could not recall the handover at all: MET000019015_0009, T11/109/5-8.
[280] WM Stuart Beale (c.01.50) MET00007512_0003 and see also MET00012994_0002 and T34/87/11-88/11. SM Mike Mulholland (01.51) MET00005219_0001. WM Harrison (c.01.35-01.40) MET00007885_0003 and WM Leaver (01.57 and 02.10) T40/101/18-103/12 and T40/105/11-17.
[281] Ioannou MET00010862 _0005, Hammond MET00014408_0003, Woodrow LAS00000009_0009, 11. As to advice from the lead agency, see Woodrow T73/103/9-10. As to the 03.00 arrival, see Woodrow T73/107/15-25. For PDA, see LAS00000008_0074 [4.6.3].
[282] O'Loughlin MET00012563_0012-13

Incident was declared without coordinating with the other emergency authorities. The concern to call in resources – raising pumps and FRU teams – overshadowed either Welch or O'Loughlin establishing the degree to which the fire had spread and broken into individual flats.[283] Any suggestion that a direct visual of the fire through the helitele would have made no difference to his decision making becomes unsustainable upon viewing that footage which so graphically demonstrates the extent of building failure and the corresponding need to evacuate all residents. O'Loughlin told the Inquiry that, prior to his relief from Incident Command, he was yet to establish FSG numbers or the degree to which their content traversed the building.[284] Despite Policy 790, especially [4.2] and [9],[285] none of the first three Incident Commanders made either direct or indirect contact with the control room, to establish any form of strategic overview. Roe would only communicate with them indirectly, on the one occasion when DAC Fenton called to query continuing the stay put advice.

3.26. Fourth, the fact that experienced senior officers could not see clearly what was before them makes the intervention of WM Harrison and the officers' reaction to it symptomatic of something bigger. Harrison knew that the fire was not just in the cladding, but within the flats, with probably 20 floors on fire, and that a floor by floor approach to escape would be fatally ineffective.[286] He intervened at the door to the Command Unit to press for revision of the stay put advice and related measures to aid evacuation.[287] No one could recall anything he said. Others at the second FSG Command Unit had similar concerns, but these were not necessarily relayed to Incident Commanders.[288] A culture which inhibited junior officers from offering an alternative perspective fatally deprived senior officers of the perspective to avoid disaster.

3.27. Fifth, a specific criticism of Roe is that he found no means to influence the drift of command once he was aware of the magnitude of the fire, prior to his arrival.[289] Roe had

[283] See O'Loughlin MET00012563_0023-24 and MET00015709_0004 describing belatedly becoming aware of fire-spread invalidating all of his original assumptions after leaving CU8.
[284] O'Loughlin T47/188/16-189/19
[285] LF00001257_0002 and 5-6
[286] Harrison MET00015872_0002
[287] Harrison T45/110/12-16 and 112/3-11
[288] See for example SM Egan MET00007515_0005 and T15/145/18-146/16, MET00007515_008 and T16/18/9-19/24. Egan thought GM Goodall was in agreement (MET00007515_0005 and T15/146/15-18), but Goodall could not recall this (T35/138/14-139/17).
[289] From his admin call at 01.38 he knew that the building was 75% alight, many people were trapped and there was a lack of clarity about who was Incident Commander (INQ00000202 and LFB00004790_0038). From the picture of the fire sent by Cook at 01.43 (MET00015779_0007), he understood that 100% of the building was alight and that this was an undeclared Major Incident: Roe MET00007520_0001-2 and Appendix A MET00005405_0001.

no strategic input before it was far too late. He could rightly contend that there was neither a system nor technology available to facilitate this, but reticence about interfering did no good. Remote access monitoring and oversight, through visual and audio technology, is an essential missing feature of present major incident practice.

3.28. Finally, Roe's assumption of command did not result in a change of strategy at the bridgehead and did not resolve the problems with that strategy (see paras 3.16 - 3.22 above). This may have been in significant part due to the woeful state of radio communications between the Command Unit and the bridgehead, which left the bridgehead without meaningful direction from the Incident Commander.[290] Neither did it improve the lack of communication between Incident Command and the control room (see section C below).

[C] THE CONTROL ROOM

3.29. The salient control room lessons arising from Lakanal House were that operators assumed that compartmentation would not fail and that fire crews would reach callers quickly.[291] An adequate post-Lakanal response needed to (1) identify compartmentation failure as a paradigm-shifting event in high rise fires, (2) speedily revoke stay put advice, (3) maximise the relevant intelligence to aid immediate evacuation, and (4) operate effectively at overflow call capacity. Having identified the problems at Lakanal, Grenfell demonstrated starkly that control room systems and training had not put in place the much-needed solutions.

3.30. Each of these four diagnostic categories is addressed in turn below, supported by an Annex citing references for the generic points made. First, operators found it difficult to conceive of breach of compartmentation within a tower block, still less if they could not see it. Instead they told callers that (a) the fire was on the fourth floor, or some lower floor, including when the caller was telling them that it was not, (b) that they were safest staying in their property despite reports of smoke and fire spread from residents, and (c) that firefighters were on their way or were working their way through the building, when there was no way of knowing if this was the case.[292]

3.31. Second, as to amending stay put advice, divergent individual approaches to when to advise callers to remain in their properties on the grounds that they were not *"affected by fire,*

[290] Welch MET0013007_0008 and T44/182/22-149/4, Goldbourne T31/138/11, O'Loughlin T41/171/12-22
[291] Lakanal House: *Fire at Lakanal, Havil Street, SE5 on 3 July 2009 – main report* HOM00001124_0050 [293] and _0054 [316]
[292] On details of the stay put advice, see Control Room Annex attached.

heat or smoke"[293] meant that there was no common understanding as to when stay put advice should be revoked.[294] Experience of giving any type of FSG advice was rare.[295] There was a long-standing practice in London not to call people back.[296] No one had practiced, or even contemplated the role of operators in counselling escape by telephone during a high rise mass evacuation context.[297] When the time came to give such advice, the operators had to improvise in what was essentially an alien discipline.[298] Consequent problems included callers being offered the choice whether to stay or go when there was none, being told they needed to leave but simultaneously advised that efforts were still being made to get to them, failing to unequivocally disabuse pleas for helicopters and evacuation by ladders that could never be met,[299] and failing to carry out call backs to inform residents that the advice had changed.[300]

3.32. Despite provision in national policy GRA 3.2,[301] neither LFB training nor policy required callers to be asked about any mobility/disability issues.[302] There was no training on how to build empathy and trust with people from different cultural, religious and language backgrounds.[303] There remains significant concern that the revocation of the stay put advice was not relayed effectively to some residents for whom English was not a first language, and, more generally, that some operators failed to communicate effectively with such residents and terminated calls with them rather than staying on the line. The Chairman will be asked to give careful consideration to these matters during fact finding for individual deaths and Phase 2. In any event, the absence of technology, policy, training or

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[293] Policy 790 *Fire Survival Guidance Calls* LFB00001257_0002 [2.2], Policy 539 *Emergency Call Management* LFB00000737_0016
[294] Cf. Howson T80/127/8-129/17, 137/11-138/16, 150/11-15 and 152/9-23, Adams T80/16/4-17, Fox T80/189/1-10, 191/4-19 and 227/1-6, Smith T22/5/13-6/20, 9/6-11/16 and 12/15-13/22
[295] Adams T80/8/19-9/8, Howson T80/125/8-126/3, Darby MET00013961_0004, Gotts MET00007694_0004, Fox T80/182/17-23, May MET00007895_0002
[296] Smith T21/26/8-12 and 109/12-21
[297] Smith T21/146/2-147/12, T21/150/6-8, T22/4/20-24 and T22/164/13-20, Fenton T24/20/4-12, Adams T80/6/7-11, 7/22-8/4 and 17/10-17, Howson T80/124/9-15, Fox T80/183/1-4
[298] Adams MET00007762_0004, Adams T80/7/22-8/11 and 97/3-5, Duddy MET00007787_0004, Smith T22/164/13-20
[299] On the quality of the get out advice, see Control Room Annex attached.
[300] Howson T80/178/7-16
[301] GRA 3.2 LFB00001255_0020: *"Fire and Rescue Authorities must also have effective arrangements in place to handle fire survival guidance calls from residents and others when they believe they are unable to leave the building due to disability, poor mobility, illness... ".*
[302] Policy 790 *Fire Survival Guidance Calls* LFB00001257_0003 [5.5], _0008 [App. 2], Policy 539 *Emergency Call Management* LFB00000737_0017, Adams T80/91/20-92/6, Howson T80/138/17-139/1, 139/19-140/4 and 161/20-162/4, Fox T80/194/25-195/13, Smith T21/130/12-131/3
[303] Smith T21/71/9-16, Fox T80/217/17-218/14

capacity to call back residents meant that people acted on stay put advice long after it had been withdrawn.[304]

3.33. Third, Incident Command throughout the night denied the control room the information it needed to inform its situational awareness. This information deficit really came to the fore when the stay put advice was revoked, but operators had no information to provide to callers about the conditions of the stairwell, or how to navigate it.[305]

3.34. Equally, the control room should have operated as an early warning system on breach of compartmentation, based on what the callers were telling operators, especially in the series of calls between 01.26 and 01.33, but failed to do so.[306]

3.35. Fourth, the LFB's capacity to handle volume calls in a mass casualty situation quickly became overwhelmed.[307] Although the fire was in London, it cried out for a nationwide operation, but there was no nationwide system or practice. London had no standing protocols in place with buddy control rooms, or otherwise. Other control rooms had operators to spare, with time to call back, which they did.[308] There is presently no evidence to explain the random and potentially unreliable way in which the BT exchange redistributed overflow calls from the LFB to other control rooms, or other emergency services. Despite having resources available, non-LFB control rooms lacked intelligence regarding the situation at the fire ground and were not informed about the change of the stay put advice. Thus, Essex had to look up Grenfell Tower on the RBKC website,[309] Surrey found out about the change of advice only by chance, and Essex were told by the police, not the LFB.[310] The NILO system, which GM Dilley followed on paper, did not exist at all in London on the night.[311] Intra-control room communication failings had stark consequences. Firefighters erroneously deployed to Flat 161, not 201, in response to Debbie Lamprell's request to North West Control to help 10 people who needed

[304] On the limited number of LFB call backs, see Control Room Annex attached. See also Howson T80/178/7-16, Adams T80/116/5-18, Smith T22/148/12-18 and 152/11.
[305] Oliff MET00012791_0006, Oliff T23/143/19-144/2 and 149/5-12, Fenton T24/171/1-172/15, Howson T80/167/15-17. See also calls at 02.49.05 (S. Macit LFB00000382), 03.02.35 (Tekle INQ00000193) and 03.09.18 (LFB00000408).
[306] On the early warning sign information from callers to the control room, see Control Room Annex attached.
[307] Adams T80/41/14-42/12, 49/12-23, 65/3-66/18, 75/5-10, 93/9-95/9, 102/4-8, 110/10-17 and 116/5-18, Darby MET00013961_0004 and 6, Gotts MET00007694_0004-5 and 7, Fox T80/203/2-7, 207/25-208/3 and 227/10-14, Smith T21/96/4-5 and T22/16/25-17/12, Oliff T23/27/7-12, 72/9-73/13, 79/2-14, 120/24-121/6 and 157/18-158/5, Fenton T24/88/20-89/2 and 137/2-23
[308] On non-LFB call backs, see Control Room Annex attached.
[309] MET00018755_0002-3, LFB00003625_0004, MET00018287_0004
[310] LFB00000685_0002-3, INQ00000284, LFB00003625_0002
[311] Dilley LFB00024396_0003, INQ00000284, LFB00003625_0004

evacuation. They found Flat 161 empty. They had tallied out at roughly the same time as Debbie Lamprell was indicating to CRO Jabin that she was about to die.[312]

[D] CIVIL CONTINGENCY

3.36. As Category 1 responders under the CCA 2004,[313] the LFB, MPS, LAS and RBKC were subject to proactive duties in relation to emergencies to assess, plan and advise as well as, under subordinate regulations, to support a responder with lead responsibility, including by providing relevant information.[314] There were three manifest failures in discharging the requirements of joint operability on the night.

3.37. First, MPS and LFB declared Major Incidents at different times and failed to keep the others informed, with material consequences.[315] For example, the lack of synchronicity in the so-called METHANE messaging meant that the nature of the Hazards and the possible Numbers of casualties lacked joined up thinking from the outset. Had the police decision of 01.32 triggered a Major Incident for all parties, then senior LFB remote supervision might well have been more assertive and the LAS pre-determined attendance would have been on site an hour earlier.

3.38. Second, the three emergency commands communicated deficiently with each other in significant ways. Many of these faults lie with the LFB. It does not have the same CAD link employed by LAS and MPS.[316] There was no joint airwave radio channel.[317] There is no evidence that the LFB control room informed either MPS or LAS about the change to the stay put advice.[318] The Command Units could not, or would not[319], receive the NPAS Heli-tele downlink, which offered critical information about fire-spread.

3.39. Given the scale of events and its role in dealing with members of the public at the fireground, the MPS inevitably played a prominent role in the provision of FSG advice and the passing of FSG information to the Command Units. Its capacity to do either was compromised by both its control room[320] and officers on the ground having no training or

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[312] Johnson MET00010082_0007 and Roots MET00012876_0004 tallied out at 02.02 (see Telemetry Sch. LFB00023326_0001). Cf. Lamprell started her 40 minute call at 01.41.18 (LFB00000486). At pages _0034-36, approximately 35 minutes into the call, she starts to lose consciousness.
[313] Civil Contingencies Act 2004: definition (s.1), duty to assess, plan and advise (s.2), definition of Category 1 Responders (Pt. 1 Sch. 1).
[314] Reg 11(2), Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005, SI 2005/2042
[315] MPS at 01.32.27 (MET00023294_0007), LFB at 02.06.03 (LFB00004496_0209), LAS at 02.25 (LAS00000009_0011). Woodrow T72/89/3-10 and T72/118/6-13. See also INQ00000376 and INQ00000375.
[316] Winch METS00020664_0005-6
[317] As required by the LESLP Major Incident Manual [4.1.2], [8.10.2]: RBK00013294_0013 and 28
[318] Winch METS00020664_0008, Woodrow T72/135/16-19
[319] Thatcher Body Worn Video footage records the observation by CU8 officers that they did not have time to use the link: INQ00000520
[320] Winch METS00020664_0008, Jerome MET00023291 and T72/11/15-15/14

instructions in providing FSG.[321] Critically, the two senior officers in charge did not register the change of stay put advice broadcast over the radio at 03.08 and 03.10, and did not act to clarify this with officers until 03.58,[322] with the very real prospect that the wrong advice was given for more than 45 minutes after the MPS learnt of the change of advice, and nearly 1½ hours after the advice was changed in the control room. Additionally, a newly qualified constable was tasked by Thatcher with the crucial role of conveying FSG information to the LFB and made a number of mistakes in relaying this life critical information.[323]

3.40. Third, RBKC fundamentally breached its Regulation 11(2)(b) duty to provide relevant information to the LFB as the lead responder in relation to residents, plans and known deficiencies in the fire prevention mechanisms of the building.[324] On all these matters it delegated to the TMO, which was not subject to clear corresponding duties.[325] Thus, for the TMO officers to say that their own Emergency Plan was irrelevant to the Grenfell fire, because of the scale of the emergency,[326] was for there to be no plan at all. The TMO's Plan was in any event redundant. It dated back 15 years, did not reflect the refurbishment,[327] and assumed 8-12 "*vulnerable*" residents without meaningful definition or detail. When it mattered, a list of residents, plans of the building and the asbestos register were not provided. The Chief Executive, the Director of Housing and the Director of the TMO's wholly owned repairs subsidiary company[328] gave evidence that they were unaware of any fire safety deficiencies in the building. This was despite the service on the TMO of a LFEPA Deficiency Notice dated 17 November 2016[329] and the extensive

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[321] Inspector Thatcher was unaware what the acronym 'FSG' meant: T71/113/3-4
[322] MET00023294_0020-21, Thatcher T70/120/14-133/13, Warnett MET000080605_0011-12, MET00023294_00028
[323] e.g. LFB0001968_0024: "*Floor 21, R 135, People 4"* when only Joseph Daniels was there, "*Floor 22, R 222, People 1"* when there was no Flat 222 on 22nd floor or at all. At 03:01 PC Jacobs missed the transmission of an audible message on her Body Worn Video (03.01.11) that persons in Flat 74 were in need of assistance (MET00023294_0019), only for a second message to be sent at 03.55 (MET00023294_0028).
[324] Layton and Rumble each passed the requests onto the TMO and gave no thought to whether RBKC would have its own records. It took Thatcher to suggest obtaining the electoral roll (Body Worn Video INQ00000518).
[325] The TMO is not a Responder under the Civil Contingencies Act 2004. Its functions are contained in the Modular Management Agreement (RBK00018796) and do not include assisting RBKC with its Civil Contingencies Act 2004 duties. While the Council's Contingency Management Plan required its Departments and Service Providers to "*maintain service emergency plans and procedures*", there is no evidence that the TMO was under a contractual duty to discharge that function. The TMO is not specified within the Contingency Management Plan as a Department or Service Provider. There is no obligation under the Modular Management Agreement to write and maintain emergency plans and procedures: RBK00004396_0010.
[326] Black T74/147/12-20, Brown T75/54/5-10
[327] TMO10013898_0145-6
[328] Black T74/221/8-19, Brown T75/130/13-20, Webb T75/30/1-9
[329] TMO00832135 (the notice had been addressed to Janice Wray who was within the email chain initiated by Black TMO10036956_0001 and responded: TMO10031176_0011).

concerns expressed to the TMO by the BSR. This state of affairs raises significant issues for exploration in Phase 2.

[E] CONCLUSION

3.41. The Inquiry can, and should, make findings and recommendations in accordance with s.2 IA 2005 that identify the extent to which the LFB breached its own policies, and in that and other respects, failed to discharge its legal duties of training, resourcing and risk assessment under the FRSA 2004.[330] Such findings are essential to the function of this Inquiry in investigating the extent of the State's compliance with its duty under Article 2 of the ECHR to have in place appropriate systems to ensure, to the greatest extent reasonably practicable, the protection of life.[331] The absence of a proper system indicates a systemic failure contrary to s. 6 of the HRA 1998.

3.42. Findings sought. G4 seek the following findings relating to the firefighting response in Phase 1.

(1) It unreasonably failed to take steps that offered a realistic prospect of preventing the deaths by failing to plan and train for the foreseeable prospect of a fire of this nature.

(2) It unreasonably persisted in maintaining a stay put strategy and failed to instigate an evacuation of the building once it was clear that compartmentation had failed and in response to real and immediate risk to life, causing considerably greater loss of life.

3.43. In addition, G4 seeks a finding of non-compliance with the duty of joint operability under the CCA 2004 in so far as (a) major incidents were declared separately by the police, LFB and LAS, (b) inter-agency communication was deficient, and (c) RBKC failed to provide reasonably obtainable information to assist the lead responder.

4. THE RESIDENTS

[A] KNOWLEDGE

4.1. The BSR evidence put certain features of the building and refurbishment beyond dispute.

(a) The door replacement programme from 2011 left the Tower exposed to an endemic issue of non-self-closing doors, enabling smoke to compromise the communal lobbies.[332]

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[330] Section 7(2)(a) and (b) FRSA 2004; duty to undertake risk assessment at [1.3] Fire and Rescue National Framework for England (DCLG, 2012, statutory guidance under s.21 FRSA 2004).

[331] *Oneryildiz v Turkey* (2005) 41 EHRR 20 §89; *R (Middleton) v HM Coroner for the Western District of Somerset* ([2004] UKHL 10) [2004] 2 AC 182 §2; *Savage v Essex Partnership NHS Foundation Trust* ([2008] UKHL 74) [2009] 1 AC 681 §19; *Mitchell v Glasgow City Council* ([2009] UKHL 11) [2009] 1 AC 874 §66 and *Van Colle v Chief Constable of Hertfordshire* [2008] ([2009] UKHL 50) [2009] 1 AC 225 §31

[332] This was especially problematic when this was flat 6 which the exterior fire reached first: Flat 76 (Khanh Quang T67/85/13-87/8, Van Ho IWS00000925 [11], [25]); Flat 116 (Mangoba IWS00001084 [3],

(b) The new windows and window cladding system had gaps, draughts and other flaws, all matters which may have contributed to fire re-entry.[333] (c) The functioning of the ventilation system was more a noise nuisance than an understood mechanism of fire safety.[334]

4.2. There were significant shortcomings in preparing residents to respond to a fire and, if necessary, self-evacuate. (a) The stay put advice by the lifts had registered with most residents, but their willingness to follow it varied.[335] (b) There was no communal alarm system, although many believed there was.[336] (c) No arrangements were made by the TMO to support evacuation of people who had mobility or other health issues.[337] (d) The unreliability of the lifts was known to all, and some people were essentially housebound unless a lift was working.[338]

[B] ESCAPE AS NEAR DEATH

4.3. The survivors suffered near death experiences. The late evacuees were left for hours, sometimes in a frantic search to find air,[339] under the false expectation that they would be rescued.[340] Many of them prepared to die.[341] Venturing into the lobbies was perilous: some judged the distance from even the no. 2 flats to the stairwell to be impossible;[342] others who walked from the no. 4 flats became disoriented and were obstructed by the floor to ceiling box feature installed opposite the lifts during the refurbishment.[343] The experience of the stairwell was terrifying.[344] Coming out of the building was dangerous and

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IWS00001145 [2]); Flat 136 (Wahbi IWS00000086 [26] [see below]); and Flat 176 (Urbano IWS00000496 [24]).

[333] Smith IWS00000771 [11], [15], T64/8/3-19/19, M. Sobieszczak IWS00001111 [6], Gomes IWS00001078 [32-37], T71/9/21-22/22, Chapman IWS00001000_0002 [10-18] (ex LC 1-7), Roncolato IWS00000892 [14], [41-42], A. Elgwahry IWS00000988 [58-62] (ex.AE 10-69), Daffarn IWS00000169 [37-45].

[334] E. Sobieszczak IWS00001105 [7], [10], [13], Urbano IWS00000496 [13], Farhad Neda IWS00000886 [16-20]

[335] It depended on multiple factors: experience of previous fires, practice at work, sixth sense apprehension, and early appreciation of the nature of the fire.

[336] Rasoul IWS00000670 [11], Daniels IWS00000608 [26], [51], T56/13/11-14/23

[337] Despite FRAs of 26 April and 20 June 2016 referencing "*... a comprehensive programme"* to gather tenant information about disabilities and physical ability/mobility in emergency situations via an electronic system of Personal Emergency Evacuation Plans ('PEEPs'): TM010013182_0022 and LFB00000066_0023-24. Cases of residents unable to independently evacuate down the stairs include Hesham Rahman (Flat 204) LFB00000368_0004-5 and Sakineh Afrasehabi (Flat 151) IWS0000767_0002 [6].

[338] e.g. Jafari IWS0000683_0005 [22], F. Neda IWS00000887_0003-4 [16]

[339] Elcock IWS00000310 [29], T70/95/21-96/17, Burton T68/47/4-14

[340] See Control Room Annex listing calls stating that firefighters were working through the building and on the quality of the get out advice.

[341] Smith T64/82/7-11 and IWS00000771 [57], [59], Demissie IWS00000860 [14], [19], [22], S. Macit IWS00000069 [96], Chance IWS00000783 [54]

[342] Elcock T70/67/9-68/24, Roncolato T52/38/2-14 and 39/3-22

[343] Daffarn IWS00000169 [12-13], Lukic IWS00000770 [31], Doulova IWS00000835 [67]

[344] Burton T68/65/14-77/14, Gomes T72/92/11-148/19

traumatic.[345] There were agonising temporary separations,[346] and separate hospital destinations.[347] Medical implications involved induced coma[348] and testing for cyanide poisoning.[349] Dementia sufferers were severely affected.[350] One of them, Pily Burton, died. An unborn child died. Several hundred people lost their homes. Permanent physical and psychological harm has been done. Long term health implications are yet to be properly established.

[C] PREVENTABLE DEATHS

4.4. G4 make generic submissions[351] that these 72 fatalities were preventable.

4.5. First, the events on floor 16 prior to 01.30 foreshadowed a tragic sequence of events that was to repeat itself across other floors. The fire had spread to Flat 136 well before 01.30. Its door, like many others, did not close.[352] Hamid Wahbi left his door open while he went to check the stairwell. The lobby was smoke engulfed by the time he got back.[353] Joseph Daniels would not leave his flat.[354] Sam Daniels went to get help. When Ed Daffarn came out of his flat, he walked through the pitch black smoke into the cupboard structure opposite the lifts and got down on the floor, where firefighters Stern and Hippel fortuitously found him.[355] But those firefighters, unaware of the common layout of the flats on each floor, did not find the right flat. The conditions required them to leave the floor, with four people there, two of whom died: Sheila Smith (Flat 132) and Joseph Daniels (Flat 135). Hippel, Stern (and O'Beirne on the landing) had sufficient knowledge that compartmentation had failed. Thus, before 01.30, firefighters were able to convey to the bridgehead that a fourth floor kitchen fire now posed a mortal danger 12 floors up. Acting on that information could and should have changed everything.

4.6. Second, the lift system had defects that had not been discovered by the TMO or s.7(2)(d) assessors. On the night the functioning lift could not be controlled via the override switch

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[345] Dolouva IWS00000835 [79], T60/46/5-17. See also Araya IWS00001193_0007-9 [34-46] and Hamide IWS00001775_0006-9 [22-37], T69/103/18-112/4, who experienced all of these traumas.
[346] e.g. Gomes T71/126/19-148/12, Yahya T68/183/21-24, Ali T59/77/7-96/15, Gebremeskel T68/187/18-192/17, Tekle T63/100/24-101/24, Shawo IWS00001050_0014-15 [46-50]
[347] e.g. Nicholas Burton T68/77/17-84/14, Gebremeskel T68/187/18-192/17
[348] Flora Neda IWS00000887 [74], Perestrelo INQ00000349 [84]
[349] Atmani IWS00000070 [54], Gebremeskel IWS00000933 [74]
[350] Rasoul IWS00000670 [49-50], Mahmud IWS00000776 [49], Burton IWS00000064 [59(6)]
[351] The Inquiry has previously held that it will conduct separate fact finding hearings in relation to individual deaths, and for the purpose of these closing submissions requested CPs "*not to make detailed submissions about the specific circumstances surrounding the death of individuals*": STI Letter 13.11.18.
[352] For formal complaint about the door of Flat 136, see Daffarn IWS00000169 [50-54] and ex. pp.63-81.
[353] Wahbi T62/36/18-37/1 and 41/11-42/10
[354] Daniels IWS00000608 [10], [54], T56/4/19-9/16, T56/55/19-57/11
[355] Daffarn IWS00000169 [13], [58]

and was not otherwise disabled to prevent it from being called by residents. One person definitely, but probably three, died because of that lift. Ali Yawar and Nadia Jafari got in before 01.26. Nadia thought that several people were present (one was Rhea Rojo[356]). The lift stopped on the 10th floor, engulfed in smoke. Panic ensued. Nadia lost contact with her father.[357] When the lift got to the ground floor, the available picture shows only Rhea and Nadia emerging.[358] The bodies of three residents were found on floor 10, none of whom were connected to it: Ali Yawar Jafari, Mohamednur Tuccu and Khadija Khalloufi.[359]

4.7. Third, the four deaths on floor 14 – Dennis Murphy, Mohamed Alhajali, Zainab Dean and Jeremiah Dean – involved a catalogue of failures. The no. 6 door was not self-closing and left open. Dennis Murphy alerted the control room to smoke logging in the lobby as early as 01.25. He, like Zainab Dean and the Alhajali brothers, was told not to leave. The floor was reached by firefighters around 02.00, by which time they should have been fully briefed regarding the imperative of urgent evacuation. The residents, including two young children, were congregated in Flat 113 with a promise of rescue. The bare number of people in Flat 113 – 8 – was written on the FIB, the second floor wall and the lobby.[360] Yet, of the four firefighters who subsequently reached Flat 113, two were deployed to a flat emptied by the previous crew and none were briefed of the 8 people in Flat 113.[361] In breach of policy,[362] Flat 113 was not searched. Four residents were left behind. For reasons that must as a matter of fairness to all be the subject of detailed submission at a later stage, FF Herrera's evidence on why he failed to appreciate this is untrue and in any event unreasonable. A team was eventually deployed to floor 14, but diverted to rescue casualties, a common feature of deployments on the night (see section 3.21). There was then a further delay of 18 minutes while the bridgehead moved, after which two separate EDBA crews were tasked to return to Flat 113 but on both occasions inexplicably redeployed to general firefighting duties.[363] As a result, four people were left to die who had been reached three times[364] by firefighters. Taking all these factors together, floor 14 stands as the paradigm of preventable death.

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[356] Rojo IWS00000066_0005 [44-52]
[357] N. Jafari IWS00000683 [22-28], T54/44/25-50/4
[358] INQ00000423-427
[359] Hoare MET00008027_0015-17, Desforges MET00008013_0005. See also Nalukwago IWS00000009 [19-22] who stumbled over bodies prior to her 10th floor lobby exit at 01.35.
[360] MET00018749 (*113 8 people 14 floor*), MET00013074 (*113 8 people 14 floor*), MET00005774 (*112 14 8P*).
[361] Orchard T39/49/12-25, Herrera T38/103/1-2, McAlonen MET00012679_0007-8, Juggins MET00010879_0008
[362] Policy 803 *Search and Rescue Procedures with Structures* LFB00000187_0005 [7.1(c)]
[363] Mayne MET00008033_0005-6, Rice MET00008038_0008
[364] The second time was by Cook MET00012855_0003-4 and Flanagan MET00007765_0006-8.

4.8. Fourth, the higher floors were never a lost cause. The accounts of the late escapes, both sole and assisted, indicate that death was preventable for some time. Some residents with mobility issues would have had difficulty, and their younger, fitter adult children stayed with them. However, the experiences of the Macits and the Nedas indicate that escape was a potential option for all. So continuing delays and confusion over the stay put advice, even after its 02.35 revision, are a matter of grave concern to the bereaved families of the higher floors.

4.9. Fifth, the fate of those higher floors is bound up with migration of people from lower floors. Several people went onto the staircase just before 01.30, but ultimately went upstairs.[365] Full evacuation required firefighters at the top of the building to direct escape, the control room to seize on the 01.30 calls revealing fire on the upper floors (such as those by Mariem Elgwahry, Helen Gebremeskel and Naomi Li), and use of the intercom system[366] if only to wake people up, and loudhailers in the stairwell to direct people to go down. Instead residents, and on some accounts firefighters, were shouting at people to go up.

5. CONCLUSION

5.1. Finally, the Phase 1 report ought not to withhold a clear finding at this stage that none of the deaths from the fire at Grenfell Tower were the product of accident. The deaths occurred because the building, as refurbished, failed to achieve adequate compartmentation, and enabled the rapid spread of fire and smoke. Loss of life was contributed to by a failure to comply with building regulations, among other failures that will need to be examined in due course. Moreover, from Phase 1, the Inquiry should additionally find that the LFB failed to take reasonable steps that bore a realistic prospect of preventing some or all of the deaths. The acts and omissions of the LFB caused considerably greater loss of life than would otherwise have been the case. In reaching these findings the Inquiry would be fulfilling its statutory function: to report and recommend on facts and other matters of relevance. This will do justice to the BSR and discharge the overwhelming public interest in making what caused this disaster clear as soon as possible.

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[365] See generally F. Neda T60/43/24-44/9 and 47/12-49/25 and Li T62/168/15-170/12. Those who migrated upstairs included Eslah and Mariem Elgwahry (Flat 196), Urbano (Flat 176), Lamprell (Flat 161), Maunders (Flat 161), Marjorie and Ernie Vital (flat 162), Sakineh and Fatemeh Afrasiabi (Flat 151), Kani (Flat 154) and Berkti and Biruk Haftom (flat 155): MET00012528_0001-4.

[366] GRA 3.2 provides that the incident commander should consider using "*all available systems within the building to communicate with occupants*".

DANNY FRIEDMAN QC, STEPHANIE BARWISE QC

LIZ DAVIES, RAJ DESAI, JESSE NICHOLLS, OMAR ELJADI

BHATT MURPHY, BINDMANS, HICKMAN & ROSE, HODGE JONES & ALLEN

6 December 2018

CONTROL ROOM ANNEX[367]

Stay put advice: fire on 4th floor/a lower floor

- 01.26.58 (Kasia Dabrowska LFB00000309, LFB00004790_0016)
- 01.30.00 (Mariem Elgwahry LFB00000310, LFB00004790_0023)
- 01.30.38 (Naomi Li LFB00000472, LFB00004790_0026)
- 01.33.01 (Natasha Elcock LFB00000313, LFB00004790_0028)
- 01.33.55 (Rabiah Yahya LFB00000662, LFB00004790_0029)
- 01.34.50 (Hashim Kedir LFB00000315_0002, LFB00004790_0030)
- 01.37.58 (Rosemary Oyewule LFB00000678, LFB00004790_0036-37)
- 01.39.15 (Hesham Rahman LFB00000329, LFB00004790_0039)
- 01.41.21 (Ann Chance LFB00000319_0003, LFB00004790_0041)
- 01.44.33 (Roy Smith LFB00000324_0002, LFB00004790_0046)
- 01.46.18 (Sener Macit LFB00000326, LFB00004790_0048-49)
- 01.56.20 (Nick Burton LFB00000334_0002, LFB00004790_0056)
- 02.10.31 (Hashim Kedir LFB00000345, LFB00004790_0069)
- 02.05.25 (LFB00000340_0003, LFB00004790_0063)

Stay put advice: safest staying in flat

- 01.39.15 (Hesham Rahman LFB00000329_0006, LFB00004790_0039)
- 01.54.14 (Roy Smith LFB00000332_0010, LFB00004790_0054)
- 02.00.33 (Anthony Disson LFB00000337, LFB00004790_0059)
- 02.10.31 (Hashim Kedir LFB00000345, LFB00004790_0069)
- 02.42.06 (LFB00000375, LFB00004790_0095)

Stay put advice: fire fighters en route/working through the building

- 01.30.00 (Mariem Elgwahry LFB00000310_0004, LFB00004790_0023)
- 01.30.08 (Jessica Urbano Ramirez LFB00000481_0010, LFB00004790_0023)
- 01.33.01 (Natasha Elcock LFB00000313_0002, LFB00004790_0028)
- 01.34.50 (Hashim Kedir LFB00000315_0004, LFB00004790_0030)
- 01.38.38 (El-Wahabi family member LFB00000677, LFB00004790_0038)
- 01.39.15 (Hesham Rahman LFB00000329_0006, LFB00004790_0039)
- 01.41.18 (Debbie Lamprell LFB00000486, LFB00004790_0041)
- 01.44.33 (Roy Smith LFB00000324_0004 and 6, LFB00004790_0046)
- 01.54.14 (Roy Smith LFB00000332_0002 and 7, LFB00004790_0054)
- 01.56.20 (Nick Burton LFB00000334_0002, LFB00004790_0056)
- 01.57.45 (Karen Aboud's son LFB00000335_0004, LFB00004790_0057)
- 02.13.03 (Nick Burton LFB00000344, LFB00004790_0072)
- 02.25.38 (Mariem Elgwahry LFB00000670_0003, LFB00004790_0080)
- 02.36.47 (Ann Chance LFB00000679, LFB00004790_0091)
- 02.37.00 (Choucair family member LFB00000366_0005-7, LFB00004790_0091)
- 02.42.06 (LFB00000375, LFB00004790_0095)
- 02.44.41 (Natasha Elcock LFB00000377, LFB00004790_0099)
- 02.49.20 (Anthony Disson LFB00000381, LFB00004790_0103)
- 03.10.34 (Hesham Rahman LFB00000409_0006, LFB00004790_0123-124)

[367] The calls identified below are intended as examples to assist. They do not represent an exhaustive list of every call on the topic to which they relate.

Quality of the get out advice

- 02.25.38 (Shekab Neda (Farhad) LFB00000680, LFB00004790_0080)
- 02.43.55 (Bassem Choukair LFB00000376_0004, LFB00004790_0098)
- 02.46.58 (Marcio Gomes LFB00000672, LFB00004790_0101)
- 02.51.09 (Naomi Li LFB00000386_0003, LFB00004790_0106)
- 02.55.38 (Marcio Gomes LFB00000392, LFB00004790_0108)
- 02.57.59 (Karen Aboud LFB00000391, LFB00004790_0111-112)
- 03.01.20 (Anthony Disson LFB00000395, LFB00004790_0116)
- 03.04.52 (Natasha Elcock LFB00000401, LFB00004790_0119)
- 03.08.56 (Choucair family member LFB00000406, LFB00004790_0122)
- 03.10.34 (Hesham Rahman LFB00000409_0006, LFB00004790_0123-124)
- 03.18.45 (LFB00000419, LFB00004790_0128)

LFB call backs

- 02.31.35 (INQ00000513, LFB00004790_0085)
- 02.51.38 (Anthony Disson INQ00000469, LFB00004790_0106)
- 03.02.35 (Paulos Tekle INQ00000193, LFB00004790_0117)
- 03.15.58 (Anthony Disson INQ00000512, LFB00004790_0127)

Early warning sign information from callers to the control room

- 01.21.24 (Naomi Li LFB00000471, LFB00004790_0012)
- 01.24.57 (Damiana Lewis[368] LFB00000304, LFB00004790_0015)
- 01.25.16 (Dennis Murphy LFB00000308, LFB00004790_0015)
- 01.26.58 (Kasia Dabrowska LFB00000309, LFB00004790_0016)
- 01.30.00 (Mariem Elgwahry LFB00000310, LFB00004790_0023)
- 01.30.02 (Helen Gebremeskel LFB00000314, LFB00004790_0023)
- 01.30.08 (Jessica Urbano Ramirez LFB00000507, LFB00004790_0023-24)
- 01.30.08 (Anthony Disson LFB00000459, LFB00004790_0024)
- 01.30.38 (Naomi Li LFB00000472, LFB00004790_0026)
- 01.32.10 (Biruk Haftom LFB00000667, LFB00004790_0027)
- 01.33.12 (LFB00000312, LFB00004790_0028)

Non-LFB call backs

- 02.16.04 (LFB00004804)
- 02.17.11 (LFB00000669, LFB00004790_0075)
- 02.51.00 (Paulos Tekle LFB00000380, LFB00004790_0105)
- 02.54 (Paulos Tekle LFB00003625_0002)
- 03.03 (Paulos Tekle LFB00003625_0001)
- 03.08.13 (Anthony Disson LFB00004790_0121)
- 03.09.17 (LFB00000654, LFB00004790_0122-123)
- 03.31.23 (Anthony Disson (LFB00000660)

[368] The identification of the caller as Damiana Lewis (Flat 96) is based on the 01.26.58 call from Flat 95 (Kasia Dabrowska LFB00000309).