

Grenfell Tower Inquiry

GRENFELL TOWER INQUIRY: PHASE 1 REPORT OVERVIEW

REPORT of the PUBLIC INQUIRY into the
FIRE at GRENFELL TOWER
on 14 JUNE 2017

Chairman: The Rt Hon Sir Martin Moore-Bick
October 2019

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Chapter 2

Executive Summary

Overview

- 2.1 This first report of the Grenfell Tower Inquiry is divided into six parts. **Part I** contains a broad introduction to the events that took place during the early hours of 14 June 2017. It contains a description of Grenfell Tower itself and of the organisation of the London Fire Brigade (LFB) and sets the scene for **Part II**, which contains a detailed narrative account of the fire and the steps taken in response to it. **Part III** contains my conclusions about the origin and development of the fire and my analysis of the response of the LFB and the other emergency services which attended the incident. The hearings commemorating those who died constituted an important part of the Inquiry's proceedings. A summary of the tributes paid to their loved ones by their families and friends is contained in **Part IV**. **Part V** contains recommendations arising out of the findings made earlier in the report and **Part VI** looks ahead to identify some matters of particular importance on which the Inquiry will concentrate its attention in Phase 2.
- 2.2 I am grateful to all those who gave evidence, both those called to give evidence in person and those who provided written statements but were not called. I am very conscious that many of those who gave evidence found it a challenging and emotional experience.

Part I: Background matters

- 2.3 **Chapter 1** of the report contains a general introduction to the Inquiry. In it I explain why I decided to conduct the Inquiry in two phases and how the Phase 1 hearings were organised, beginning with commemorations of those who lost their lives in the disaster. I draw attention to the fact that the Inquiry is being conducted in parallel to investigations being carried out by the Metropolitan Police Service (MPS) and Her Majesty's Coroner for Inner London (West), Professor Fiona Wilcox.
- 2.4 **Chapter 3** describes Grenfell Tower itself, completed in 1974, and the changes that were subsequently made to the building and its immediate surroundings, culminating in the tower's most recent refurbishment, which was completed in 2016. It explains the mix of rental and leasehold properties in the tower, the community which lived there, and the different functions of the Royal Borough of Kensington and Chelsea (RBKC) as owner of the building and the RBKC Tenant Management Organisation (TMO) as its manager.
- 2.5 In **Chapter 4** there is an explanation of the principles underpinning fire safety in high-rise residential buildings, such as Grenfell Tower, which have led to the adoption of the "stay put" strategy in response to fires occurring within individual flats.
- 2.6 A summary of the primary and secondary legislation relevant to the original construction and the later refurbishment of Grenfell Tower is to be found in **Chapter 5**, together with a reference to certain aspects of the relevant guidance on methods of complying with the legislative requirements.

- 2.7 **Chapter 6** provides an overview of the refurbishment. It contains a description of the new cladding system, associated changes to the windows and their surrounds, and the addition of an architectural crown, as well as other features of the building that were intended to promote safety in the event of a fire.
- 2.8 The structure and organisation of the LFB, including its statutory responsibilities, the principles which govern its operations (particularly in relation to fighting fires in high-rise buildings) and the equipment at its disposal, are described in **Chapter 7**. That chapter also contains a description of the control room and its method of working. The chapter concludes with a description of some of the equipment used by the LFB to which reference is made in subsequent chapters.
- 2.9 **Chapter 8** refers to the Lakanal House fire, which represents an important aspect of the background to the Grenfell Tower fire. On 3 July 2009 a fire broke out on floor 9 of Lakanal House, a 14-floor building in Southwark. The fire spread rapidly to other floors and smoke affected large parts of the building. Six people died. The coroner made a number of recommendations for change following the fire, some of which were directed at the LFB. The LFB undertook a detailed internal review of its practices and policies relating to 999 call-handling in general and to those calls requiring potentially life-saving fire survival guidance (FSG calls) in particular. The review questioned whether the control room should assume that fire crews would reach FSG callers quickly and whether in general it correctly balanced the risk of staying put against the risk of attempting to escape. Despite changes in policy, similar shortcomings were displayed by the control room when responding to callers from Grenfell Tower.

Part II: The events of 14 June 2017

- 2.10 **Chapters 9 – 20**, which make up **Part II** of the report, contain a detailed narrative of the events organised into 11 separate periods between 00.54, shortly before the control room received the first call concerning a fire at Grenfell Tower, and 08.10, when the last survivor left the tower. The account relies on the evidence of survivors and firefighters, source material such as records of 999 calls, and the evidence of expert witnesses called to assist the Inquiry. Each period covers the behaviour of the fire, the events at the incident ground and in the control room, the conditions in the tower itself, the movement of the occupants, and the actions of the MPS, the London Ambulance Service (LAS), RBKC and the TMO. Annex A to Part II contains a list of those who were present in the tower as at 00.54 and the times at which they left the building.
- 2.11 The following key events form the backbone of the Narrative:
- 00.54** Behailu Kebede calls 999 to report a fire in Flat 16, floor 4 Grenfell Tower.
 - 00.59** First firefighters reach the tower.
 - 01.09** Fire breaks out of Flat 16 into exterior cladding and starts to climb the east facade rapidly.
 - 01.14** Firefighters enter the kitchen of Flat 16 for the first time.
 - 01.21** First 999 call to the control room from an occupant in the tower (Naomi Li, Flat 195, floor 22).
 - 01.25** First 999 call to report smoke coming into flat from lobby (Denis Murphy, Flat 111, floor 14).

- 01.26** MPS declares a Major Incident.
- 01.27** Fire reaches the roof and starts to spread horizontally.
- 01.29** WM Michael Dowden, the LFB incident commander, makes pumps 20 (having made up from 4 to 6, to 8, to 10 and to 15 between 01.13 and 01.28).
- 01.30** First 999 call reporting fire penetrating a flat (Mariem Elgwahry, Flat 196, floor 22).
- 01.31** WM Dowden makes pumps 25. By this time 110 out of 297 occupants have escaped; the fire starts to spread to the north elevation of the tower.
- 01.42** The LAS declares a Significant Incident.
- 01.45** First NPAS (police) helicopter arrives at the scene.
- 01.50** WM Dowden hands over incident command to SM Andrew Walton. By this time 168 of 297 occupants had escaped.
- 01.58** SM Walton hands over incident command to DAC Andrew O’Loughlin.
- 02.00** Flames travel across the north and east elevations of the tower, and start to spread around the crown and diagonally across the face of the building, affecting flats in the south-east and north-west corners.
- 02.04** GM Richard Welch declares himself incident commander, not knowing that DAC O’Loughlin has already assumed command.

GM Welch makes pumps 40.
- 02.06** GM Welch declares a Major Incident.
- 02.11** DAC O’Loughlin takes handover from GM Welch.
- 02.15** SOM Joanne Smith arrives at the control room.
- 02.17** Bridgehead moves from floor 2 up to floor 3.
- 02.20** Flames start to spread to south elevation.
- 02.26** The LAS declares a Major Incident
- 02.35** Control room decides to revoke the “stay put” advice and tell all occupants calling 999 to leave the tower.
- 02.44** AC Andrew Roe takes over incident command from DAC O’Loughlin.
- 02.47** AC Roe revokes the “stay put” advice.
- 02.50** Fire spreads horizontally across the south elevation at the crown.

Commissioner Dany Cotton arrives at Grenfell Tower.
- 03.00** Fire starts to spread across the west elevation of tower, from north to south.
- 03.08** Bridgehead relocates to ground floor lobby.
- 03.20** First Tactical Co-ordination Group (TCG) meeting.
- 03.30** Flames continue to spread across the south and west elevations of the tower.

04.02 Fires on the south and west elevations start to converge at the top of the southern corner of the west face.

08.07 Elpidio Bonifacio, the last survivor to leave the tower, is evacuated.

Part III: Conclusions

The cause and origin of the fire and its escape from Flat 16

2.12 In **Chapter 21** I consider the cause and origin of the fire and find that it was started by an electrical fault in a large fridge-freezer in the kitchen of Flat 16, for which Behailu Kebede bears no blame. I have not been able to establish the precise nature of the fault in the fridge-freezer, but consider that to be of less importance than establishing how the failure of a common domestic appliance could have had such disastrous consequences. That question is pursued in **Chapter 22**, in which I find that:

- a. The fire is most likely to have entered the cladding as a result of hot smoke impinging on the uPVC window jamb, causing it to deform and collapse and thereby provide an opening into the cavity between the insulation and the ACM cladding panels through which flames and hot gases could pass. It is, however, possible (but less likely) that flames from the fire in the fridge-freezer passed through the open kitchen window and impinged on the ACM cladding panels above.
- b. The fire had entered the cladding before firefighters opened the kitchen door in Flat 16 for the first time at 01.14.
- c. A kitchen fire of that relatively modest size was perfectly foreseeable.

The subsequent development of the fire

2.13 The progress of the fire after it had entered the cladding is considered in **Chapter 23**. Once the fire had escaped from Flat 16, it spread rapidly up the east face of the tower. It then spread around the top of the building in both directions and down the sides until the advancing flame fronts converged on the west face near the south-west corner, enveloping the entire building in under three hours. I find that:

- a. The principal reason why the flames spread so rapidly up, down and around the building was the presence of the aluminium composite material (ACM) rainscreen panels with polyethylene cores, which acted as a source of fuel. The principal mechanism for the spread of the fire horizontally and downwards was the melting and dripping of burning polyethylene from the crown and from the spandrel and column panels, which ignited fires lower down the building. Those fires then travelled back up the building, thereby allowing the flame front to progress diagonally across each face of the tower.
- b. The presence of polyisocyanurate (PIR) and phenolic foam insulation boards behind the ACM panels, and perhaps components of the window surrounds, contributed to the rate and extent of vertical flame spread.
- c. The crown was primarily responsible for the spread of the fire horizontally, and the columns were a principal route of downwards fire spread.

The loss of compartmentation and the spread of fire through the tower

- 2.14 In **Chapter 24** I consider the evidence relating to the penetration of the building by fire and smoke and the rapid loss of compartmentation. The fire on the outside of the building quickly entered many flats and smoke spread rapidly through the interior of the building. As a result, effective compartmentation was lost at an early stage. Compartmentation failed because:
- The intensity of the heat was such that the glass in the windows inevitably failed, allowing the fire to penetrate flats.
 - Extractor fan units in the kitchens had a propensity to deform and become dislodged, providing a point of entry.
 - A number of key fire protection measures inside the tower failed. Although some fire doors held back the smoke, others did not. Some were left open and failed to close because they lacked effective self-closing devices; others were broken down by firefighters or wedged open with firefighting equipment.
- 2.15 The spread of fire and smoke within the tower is described in **Chapter 25**. Many lobbies had started to fill with smoke by around 01.20 and some were significantly smoke-logged by 01.40. By 02.00 a significant number were heavily smoke-logged. Until around 01.50 there was less smoke in the stairs; by then 168 people had been able to escape. After that time the stairs started to fill with smoke, particularly at lower levels. At some levels the smoke was thick and the heat considerable. By 02.20 the smoke in the stairs did pose a risk to life, but the stairs were not absolutely impassable to all even after that time.

Compliance with the Building Regulations

- 2.16 It was not my original intention to include in Phase 1 of the Inquiry an investigation into the extent to which the building complied with the requirements of the Building Regulations. However, as I have explained in **Chapter 26**, there was compelling evidence that the external walls of the building failed to comply with Requirement B4(1) of Schedule 1 to the Building Regulations 2010, in that they did not adequately resist the spread of fire having regard to the height, use and position of the building. On the contrary, they actively promoted it. It will be necessary in Phase 2 to examine why those who were responsible for the design of the refurbishment considered that the tower would meet that essential requirement.

The LFB: planning and preparation

- 2.17 Planning and preparation by the LFB for fires in high-rise buildings is examined in **Chapter 27**. National guidance requires fire and rescue services to draw up contingency evacuation plans for dealing with fires in high-rise buildings that spread beyond the compartment of origin causing a “stay put” strategy to become untenable. They should understand, for any given high-rise building in their area, when a partial or full evacuation might become necessary and provide appropriate training to incident commanders.
- 2.18 The LFB’s policy for fighting fires in high-rise buildings, PN633, envisages that evacuation of a high-rise residential building may be necessary and suggests that during familiarisation visits officers consider evacuation arrangements. However, the LFB’s preparation and planning for a fire such as that at Grenfell Tower was gravely inadequate. In particular:
- The otherwise experienced incident commanders and senior officers attending the fire had received no training in the particular dangers associated with combustible cladding, even though some senior officers were aware of similar fires that had occurred in other

- countries, and of the fact that construction materials and methods of construction were being used in high-rise building facades with a limited understanding of their behaviour and performance in a fire.
- b. LFB incident commanders had received no training in how to recognise the need for an evacuation or how to organise one.
 - c. There was no contingency plan for the evacuation of Grenfell Tower.
 - d. Although the LFB purports to maintain an operational risk database (ORD) for buildings in London and has a risk assessment policy (PN800) accessible by all operational firefighters at an incident, the entry on the ORD for Grenfell Tower contained almost no information of any use to an incident commander called to a fire. Such information as was contained in the ORD was many years out of date and did not reflect the changes made by the refurbishment.
 - e. In some cases, basic information relating to the tower held by the LFB was wrong and in others it was missing altogether.

The LFB: at the incident ground

- 2.19 My findings about operations on the incident ground are to be found in **Chapter 28**. The firefighters who attended the tower displayed extraordinary courage and selfless devotion to duty, but the first incident commanders, although experienced, were of relatively junior rank. They were faced with a situation for which they had not been properly prepared. In particular:
- a. None of them seem to have been able to conceive of the possibility of a general failure of compartmentation or of a need for mass evacuation; they neither truly seized control of the situation nor were able to change strategy.
 - b. Once it was clear that the fire was out of control and that compartmentation had failed, a decision should have been taken to organise the evacuation of the tower while that remained possible. That decision could and should have been made between 01.30 and 01.50 and would be likely to have resulted in fewer fatalities. The best part of an hour was lost before AC Roe revoked the “stay put” advice.
 - c. The LFB continued to rely on the “stay put” strategy in place for Grenfell Tower which was not questioned, notwithstanding all the early indications that the building had suffered a total failure of compartmentation.
 - d. No systematic arrangements were made for information about the number and source of FSG calls to be communicated to the incident commanders. Similarly, information about the internal spread of the fire and the results of rescue operations was not effectively shared with incident commanders; pictures from the police helicopter were not available to them.
 - e. There were serious deficiencies in command and control. Although additional resources arrived swiftly, some senior officers failed to give sufficient practical support or inform themselves quickly enough of conditions and operations within the building.
 - f. Many of the physical or electronic communication systems did not work properly, such as the command support system (CSS) on the command units.

The LFB: in the control room

- 2.20 **Chapter 29** contains my findings about the operation of the control room. The control room staff faced an unprecedented number of 999 calls relating to the fire which posed a challenge wholly outside their long experience and training. Control room staff undoubtedly saved lives, but a close examination of the control room's operations has revealed shortcomings in practice, policy and training. In particular:
- a. LFB policy on handling FSG calls requires control room operators (CROs) to stay on the line with callers until they are rescued or can otherwise leave the building, but the number of FSG calls received during the fire far exceeded the number of CROs available, putting them in an invidious position.
 - b. Neither the application of the "stay put" policy nor the specific requirements that have to be followed if an FSG caller is to escape from a burning building are properly set out in the LFB policy documents.
 - c. CROs did not always obtain necessary information from callers, such as flat numbers, the number of people present, or whether people were disabled; nor did they always assess conditions at the callers' locations and hence the possibility of their escape.
 - d. CROs had not been trained to handle numerous simultaneous FSG calls, on the implications of a decision to evacuate, or on the circumstances in which a caller should be advised to leave the building or stay put. They were not aware of the danger of assuming that crews would always reach callers, which was one of the important lessons that should have been learnt from the Lakanal House fire. As a result, they gave assurances which were not well founded.
 - e. When the "stay put" advice was revoked and occupants were to be told to leave the building, the CROs did not all understand that they had to give that advice in unequivocal terms so that the caller would know that they had no choice but to leave the building.
 - f. Channels of communication between the control room and the incident ground were improvised, uncertain and prone to error. CROs did not therefore know enough about conditions in the tower or the progress of responses to individual FSG calls, so they lacked a sound basis for telling callers whether help was on its way.
 - g. Those on the incident ground did not have access to valuable information from the control room. The very fact that CROs had to terminate FSG calls in order to answer new calls ought to have alerted more senior control room officers to the fact that it had become impractical to give proper FSG advice.
 - h. There was no organised means of sharing information obtained from callers among the CROs, and little access to information from other sources. As a result, CROs had no overall picture of the speed or pattern of fire spread. Early on in the incident CROs told occupants that the fire was still confined to floor 4 when in fact it had reached the top of the tower.
 - i. Although the LFB has arrangements in place for handling a large number of 999 calls, routing them to other fire and rescue services, they do not provide for sharing information about conditions at the incident itself. Differing advice was given at important moments.
 - j. There were weaknesses in the supervision of control room staff. Supervisors were under the most enormous pressure, but the LFB had not provided its senior control room staff

with appropriate training on how to manage a large-scale incident with a large number of FSG calls.

- k. Mistakes made in responding to the Lakanal House fire were repeated.

The response of the other emergency services, RBKC and the TMO

2.21 The response of the other emergency services, RBKC and the TMO is considered in **Chapter 30**, which describes the standing arrangements and protocols for joint operations between London's emergency services. It is clear that although in some respects they were implemented successfully (for example, the management of the security cordon by the MPS), the response was unsatisfactory in other respects. The evidence does not show that any death or injury resulted from these failures but they contain important lessons for future major disasters in London. In particular:

- a. The MPS declared a Major Incident at 01.26 without telling the LFB or the LAS. The LFB declared a Major Incident at 02.06 without telling the MPS or the LAS; and the LAS declared a Major Incident at 02.26 without telling the LFB or the MPS. RBKC was not told about any of these declarations until 02.42. This lack of communication was a serious failure to comply with the joint working arrangements and protocols designed for major emergencies in London.
- b. The consequence of failing to share the declarations of a Major Incident meant that the need for a properly co-ordinated joint response between the emergency services was not appreciated early enough. That in turn led to a lack of shared understanding of the nature and effect of the fire. The conversations that should have taken place between the supervisors of the different control rooms did not happen.
- c. Communication between the emergency services on the night of the fire, both remotely and on the incident ground itself, did not meet the standards required by the protocols. A single point of contact in each control room and direct communication between control room supervisors should have been established.
- d. The heli-tele downlink (the communication link with the police helicopter overhead) failed to function, which adversely affected LFB operations.

2.22 RBKC is subject to certain obligations under the Civil Contingencies Act 2004 and had a formal "Contingency Management Plan" setting out what needed to be done in the event of an emergency. The TMO had no obligations under that plan. It had its own emergency plan, but it was not activated and was in any case fifteen years out of date. As RBKC's response to the fire relied on key information held by the TMO, its plan was in certain respects ineffective. One particular cause for concern is the delay in obtaining the attendance of a Dangerous Structures Engineer (DSE), despite numerous requests from the LFB; another is the delay in obtaining plans of the building, which were not on site, not on the LFB's ORD and not available to the LFB until around 08.00.

Shutting off the supply of gas to the tower

2.23 **Chapter 31** describes the steps taken to isolate the tower from the main gas supply. Gas was supplied to the tower by Cadent Gas Ltd (Cadent). Cadent had a legal obligation to help the LFB, and had reported to the incident ground before 05.00. Fortunately, a key Cadent engineer, Jason Allday, who knew the area well, subsequently arrived unprompted, took charge, and stayed for 24 hours. Shutting off the gas to the tower ultimately involved Cadent's

cutting and capping off three substantial pipes under nearby streets supplying gas to the whole area. The work was completed by 23.40 and the remaining flames in the tower died down almost immediately.

Part IV: Remembering those who died

- 2.24 **Chapter 32** contains a summary of the tributes paid to those who died in the fire at the commemoration hearings with which the Inquiry opened. The Inquiry started its Phase 1 hearings at the Millennium Gloucester Hotel in Kensington with commemorations of all those who died and a celebration of their lives. This part of the report names each of those who died and, drawing on the evidence given by loved ones and friends, provides a brief summary of their lives.

Part V: Recommendations

- 2.25 Although Phase 1 of the Inquiry has been limited to investigating the course of events during the night of 14 June 2017 and much work remains to be done, it has already become clear that some important steps need to be taken to improve fire safety, including the response of the LFB and other fire and rescue services to major disasters, including fires in high-rise residential buildings. **Chapter 33** therefore contains recommendations arising out of the evidence heard in Phase 1 and the findings of fact based on it. It would not be appropriate to make recommendations at this stage in relation to matters that have not been the subject of investigation, such as the regime surrounding the testing and certification of building materials, even though there are grounds for thinking that changes may need to be made.
- 2.26 Chapter 33 does not lend itself to being summarised. It should be read in full, because it sets out my recommendations in detail and explains the basis on which they are being made (or in some cases why certain recommendations are not being made). In summary, however, I make recommendations for change in relation to the following matters:
- a. The information made available to fire and rescue services about the materials and methods of construction used in the external walls of high-rise residential buildings.
 - b. The arrangements made by the LFB to discharge its duties under section 7(2)(d) of the Fire and Rescue Services Act 2004.
 - c. The availability of plans of high-rise residential buildings to local fire and rescue services and the provision of premises information boxes in high-rise residential buildings.
 - d. The regular inspection and testing of lifts designed for use by firefighters.
 - e. Communication between the LFB control room and the incident commander.
 - f. The way in which fire and rescue services handle emergency calls.
 - g. The LFB's command and control procedures and use of resources, in particular the capture of information from crews returning from deployments and the sharing of information between the LFB control room, the incident commander and the bridgehead.
 - h. The communication equipment available to the LFB for use by crews deployed in firefighting and rescue operations in high-rise buildings.
 - i. The evacuation of high-rise residential buildings, including the provision of equipment enabling firefighters to send an evacuation signal to the whole or a selected part of the building.

- j. The provision of fire safety information to residents of high-rise residential buildings and the marking of floor levels in lobbies and staircase landings.
- k. The inspection of fire doors and self-closing devices.
- l. Aspects of co-operation between the emergency services.

Part VI: Looking ahead to Phase 2

- 2.27 In Phase 2 the Inquiry will seek to answer the various questions set out in the List of Issues which appears on its website, but as a result of what has been learnt from the work done in Phase 1, some questions have assumed greater prominence than had previously been thought and others have receded in importance. Accordingly, in the final chapter of the report, **Chapter 34**, there is a pointer to those aspects of the Inquiry's investigations on which, in the light of Phase 1, particular attention will need to be focused in Phase 2.
- 2.28 The first matter concerns the deceased. An important element of Phase 2 will be to complete the investigation of the circumstances in which those who died in the fire met their deaths. Many of the findings that are required by the coroner have been made in this report, but there remains the need for an investigation into the wider circumstances that can only be satisfied by the evidence that will emerge during the proceedings in Phase 2. In due course there will be an opportunity for the bereaved to draw together the threads of the evidence relating to those who died in order to enable the necessary findings of fact to be made.
- 2.29 Other matters of particular concern include:
- a. The decisions relating to the design of the refurbishment and the choice of materials.
 - b. The regime for testing and certifying the reaction to fire of materials intended for use in construction.
 - c. The design and choice of materials.
 - d. The performance of fire doors in the tower, in particular, whether they complied with relevant regulations, their maintenance and the reasons why some of the self-closing devices do not appear to have worked.
 - e. The organisation and management of the LFB, in particular in relation to the formulation of policy in the light of experience, the arrangements for training firefighters and control room staff, and the arrangements for sharing information about the particular problems associated with fighting fires in high-rise buildings.
 - f. The warnings of potential fire hazards given by the local community.
 - g. The authorities' response to the disaster.
- 2.30 It has now become clear that some aspects of the building which were at one time thought to require careful investigation did not play a significant role in the disaster and will not therefore require further examination. They include:
- a. The width of the stairs.
 - b. The supply of gas.
 - c. The supply of electricity and the history of electrical surges.

Chapter 33

Recommendations

1 Introduction

- 33.1 Phase 1 of the Inquiry has been concerned with investigating the cause of the fire, its subsequent development and the steps taken by the LFB and the other emergency services in response to it. In the course of it I have touched on the training given to the firefighters and CROs in relation to responding to fires in high-rise buildings and other incidents of a kind that may generate a significant number of calls from people seeking advice and assistance. Phase 2 will involve a more detailed examination of certain aspects of the management of the LFB (in particular its understanding of modern methods of construction and of the way in which some of the materials currently in use behave when exposed to fire) and the steps that were taken to train its officers to respond to fires in high-rise buildings. However, the evidence put before me in Phase 1 is already sufficient to demonstrate that a number of improvements can be made both in the way in which high-rise residential buildings are designed, constructed, approved and managed and in the way in which fire and rescue services respond to fires in such buildings.
- 33.2 The core participants and the experts who gave evidence in Phase 1 have suggested many steps which in their view can and should be taken to improve the safety of those who live in high-rise buildings and should therefore form the subject of immediate recommendations. However, they exhibited a wide divergence of views. It is important that any recommendations I make at this, or indeed any other, stage should be based firmly on the facts that have emerged from the evidence obtained by the Inquiry in the course of its investigations. I also think it important that they command the support of those who have experience of the matters to which they relate. Recommendations that are not grounded in the facts are of no value and recommendations that do not command the support of those who are experts in the field are likely to be ignored and, if not ignored, risk giving rise to adverse unintended consequences.
- 33.3 The recommendations set out below are therefore based entirely on the evidence I have heard in relation to the particular issues that were investigated in Phase 1 and on the findings and conclusions I have been able to reach in this report. They do not attempt to anticipate the evidence to be called in Phase 2 or the conclusions that may be drawn from it, and when deciding what recommendations should be made at this stage I have had regard in particular to their capacity for making a significant contribution to the safety of those who live in high-rise buildings. I am grateful to those of the core participants who made submissions on this subject, all of which I have considered carefully before making my recommendations. I refer to some of them in more detail in later paragraphs.
- 33.4 In England and Wales, high-rise buildings have conventionally been defined for the purposes of fire safety as buildings over 18 metres in height. In Scotland, however, the regulations have recently been changed so that the requirements relating to high-rise buildings apply to buildings over 11 metres in height. It is for consideration whether the position in England should now also be changed and, if so, what height should be adopted for that purpose. However, that question was not the subject of examination in Phase 1 and it is therefore not possible for me to make a recommendation about it at this stage. It is, however, a matter which will be examined in Phase 2.

- 33.5 When considering steps that might be taken to improve safety in relation to high-rise buildings generally it is important not to lose sight of certain matters. The first is that, although not unprecedented, fires of the kind that occurred at Grenfell Tower are rare. The widespread use of combustible rainscreen cladding panels and insulation on the exterior of buildings and the introduction of new kinds of building materials in external walls may have increased the risk of similar fires, but improvements in the regulations relating to fire safety and the requirements for testing and certification of materials, which will be a particular focus of attention in Phase 2, should be capable of mitigating that risk in the future. Effective compartmentation is likely to remain at the heart of fire safety strategy and will probably continue to provide a safe basis for responding to the vast majority of fires in high-rise buildings. However, in the case of some high-rise buildings it will be necessary for building owners and fire and rescue services to provide a greater range of responses, including full or partial evacuation. Appropriate steps must therefore be taken to enable alternative evacuation strategies to be implemented effectively.

2 Use of combustible materials

- 33.6 It is clear that the use of combustible materials in the external wall of Grenfell Tower, principally in the form of the ACM rainscreen cladding, but also in the form of combustible insulation, was the reason why the fire spread so quickly to the whole of the building. Surveys undertaken since the fire have established that external wall materials similar to those used on Grenfell Tower have been used on over 400 other high-rise residential buildings around the country. From the evidence put before me in Phase 1, two very important matters have come to light: first, that in its origin the fire at Grenfell Tower was no more than a typical kitchen fire; second, that the fire was able to spread into the cladding as a result of the proximity of combustible materials to the kitchen windows. It is not possible to say whether the same or a similar combination of design and materials is to be found on any other buildings, but it would be sensible for those responsible for high-rise buildings with similar cladding systems, if they have not already done so, to check whether the same or a similar combination exists. However, even if they do not, fires can occur in a wide variety of circumstances and in cases where the exterior walls of the building include combustible materials of a similar kind, might gain access to it by a variety of different routes. It is not surprising, therefore, that people living in such buildings are concerned for their safety. It is unnecessary for me to recommend that panels with polyethylene cores on the exterior of high-rise buildings be removed as soon as possible and replaced with materials of limited combustibility because it is accepted that that must be done. It is essential that it be done as quickly as possible and concern has been voiced publicly, most recently by the House of Commons Communities and Local Government Select Committee, about the apparently slow rate of progress in carrying out the work.¹ In the light of what has been learnt in Phase 1 about the behaviour of ACM panels with polyethylene cores when exposed to fire, I wish to add my voice to that of the committee in expressing the view that the programme of remedial work should be pursued as vigorously as possible. In view of the part played by the architectural crown in the spread of the fire at Grenfell Tower, particular attention must be paid to decorative features composed of combustible materials.
- 33.7 It has been suggested by certain core participants that I should recommend that no materials be permitted for use in the external walls of high-rise buildings that are not of Euro class A1 (the highest classification of reaction to fire in accordance with BS EN 13501-1). That is a matter on which views differ, however, and following a consultation the government has already prohibited the use on certain types of new buildings of materials whose classification

¹ <https://publications.parliament.uk/pa/cm201719/cmselect/cmcomloc/2546/254602.htm>

of reaction to fire is lower than A2s1, d0. Having regard to the outcome of that consultation, and in the absence of any examination of the competing views, I do not think it appropriate at this stage for me to recommend any change to the regulations in this respect. Nor, for similar reasons, do I think it appropriate for me to recommend an immediate moratorium on the use of materials of Euro class A2 pending the outcome of Phase 2 of the Inquiry, despite the submissions pressed upon me by some of the core participants.

3 Testing and certification of materials

- 33.8 The regulation of the use of materials and products by reference to their fire classification depends to a large extent on the efficacy of the testing requirements and how they are interpreted by professionals. Early in Phase 2, the Inquiry will investigate the methods of testing and certifying materials for use in high-rise buildings. It will also investigate whether a prescriptive regime is the most effective way in which to ensure the safety of those who live and work in high-rise buildings and whether the current guidance on how to comply with the Building Regulations is sufficiently clear and reliable. None of those questions have been examined in Phase 1 and at this stage, therefore, I am not in a position to make any recommendations about any of those matters.

4 Fire and rescue services: knowledge and understanding of materials used in high-rise buildings

- 33.9 Although some senior officers within the LFB were aware of the dangers of cladding fires in high-rise buildings, the majority, particularly at the more junior levels, were unaware of them and were not trained to recognise the nature of the fire that occurred at Grenfell Tower. Moreover, the LFB was unaware of the combustible nature of the materials used in the cladding of Grenfell Tower and was therefore not in a position to formulate a contingency plan for a fire of this kind.
- 33.10 A sound understanding of the materials used in the construction of any high-rise building is essential if the fire and rescue service is to be properly prepared to carry out its function in relation to that building. The risk of fire of the kind that occurred at Grenfell Tower may be low, but knowledge is the key to proper planning and effective training. **I therefore recommend:**
- d. that the owner and manager of every high-rise residential building be required by law to provide their local fire and rescue service with information about the design of its external walls together with details of the materials of which they are constructed and to inform the fire and rescue service of any material changes made to them;
 - e. that all fire and rescue services ensure that their personnel at all levels understand the risk of fire taking hold in the external walls of high-rise buildings and know how to recognise it when it occurs.

5 Section 7(2)(d) of the Fire and Rescue Services Act 2004

- 33.11 Section 7(2)(d) imposes a general duty on fire and rescue authorities to make arrangements for obtaining information needed for the purposes of extinguishing fires and protecting life and property. The LFB appears to have thought that it required nothing more than sending crews to inspect individual buildings in accordance with Appendix 1 to PN633. However,

this essential duty is not circumscribed in that way. Moreover, crews who visited Grenfell Tower during its refurbishment were not trained to carry out the inspections properly: see Chapter 27, paragraphs 24-27. **I therefore recommend:**

- a. that the LFB review, and revise as appropriate, Appendix 1 to PN633 to ensure that it fully reflects the principles in GRA 3.2;
- b. that the LFB ensure that all officers of the rank of Crew Manager and above are trained in carrying out the requirements of PN633 relating to the inspection of high-rise buildings.

6 Plans

33.12 No plans of the internal layout of the building were available to the LFB until the later stages of the fire. However, because each floor of the building above floor 3 was laid out in the same way, the LFB was not unduly hampered in its attempt to fight the fire and rescue occupants by the absence of those plans. In another case, however, the lack of floor plans might easily have far more serious consequences. It should be a simple matter for the owners or managers of high-rise buildings to provide their local fire and rescue services with current versions of such plans. **I therefore recommend** that the owner and manager of every high-rise residential building be required by law:

- a. to provide their local fire and rescue services with up-to-date plans in both paper and electronic form of every floor of the building identifying the location of key fire safety systems;
- b. to ensure that the building contains a premises information box, the contents of which must include a copy of the up-to-date floor plans and information about the nature of any lift intended for use by the fire and rescue services.

I also recommend, insofar as it is not already the case, that all fire and rescue services be equipped to receive and store electronic plans and to make them available to incident commanders and control room managers.

7 Lifts

33.13 When the firefighters attended the fire at Grenfell Tower they were unable to operate the mechanism that should have allowed them to take control of the lifts. Why that was so is not yet known, but it meant that they were unable to make use of the lifts in carrying out firefighting and search and rescue operations. It also meant that the occupants of the tower were able to make use of the lifts in trying to escape, in some cases with fatal consequences. The ability of fire and rescue services to take control of firefighting or fire lifts in a high-rise building is often key to successful operations. **I therefore recommend:**

- a. that the owner and manager of every high-rise residential building be required by law to carry out regular inspections of any lifts that are designed to be used by firefighters in an emergency and to report the results of such inspections to their local fire and rescue service at monthly intervals;
- b. that the owner and manager of every high-rise residential building be required by law to carry out regular tests of the mechanism which allows firefighters to take control of the lifts and to inform their local fire and rescue service at monthly intervals that they have done so.

8 Communication between the control room and the incident commander

- 33.14 The evidence shows that although both national policy and the LFB's policies call for a free flow of information between the control room and the incident commander, in practice that does not occur, at least when one or the other (or both) are operating under significant pressure. **I therefore recommend:**
- that the LFB review its policies on communications between the control room and the incident commander;
 - that all officers who may be expected to act as incident commanders (i.e. all those above the rank of Crew Manager) receive training directed to the specific requirements of communication with the control room;
 - that all CROs of Assistant Operations Manager rank and above receive training directed to the specific requirements of communication with the incident commander;
 - that a dedicated communication link be provided between the senior officer in the control room and the incident commander.

9 Emergency calls

- 33.15 Even allowing for the fact that the control room was operating under great pressure, it is clear that in many cases CROs failed to handle FSG calls in an appropriate or effective way. **I therefore recommend:**
- that the LFB's policies be amended to draw a clearer distinction between callers seeking advice and callers who believe they are trapped and need rescuing;
 - that the LFB provide regular and more effective refresher training to CROs at all levels, including supervisors;
 - that all fire and rescue services develop policies for handling a large number of FSG calls simultaneously;
 - that electronic systems be developed to record FSG information in the control room and display it simultaneously at the bridgehead and in any command units;
 - that policies be developed for managing a transition from "stay put" to "get out";
 - that control room staff receive training directed specifically to handling such a change of advice and conveying it effectively to callers.
- 33.16 The handling of emergency calls by other fire and rescue services was hampered by their lack of information about the nature of the incident and the way in which it had developed. Those who respond to emergency calls on behalf of the LFB need to have as much information as possible about the incident in order to be able to give appropriate advice. **I therefore recommend** that steps be taken to investigate methods by which assisting control rooms can obtain access to the information available to the host control room.

- 33.17 On occasions, MetCC operators and LAS CROs handled calls from people in the tower seeking FSG advice. Sometimes they gave advice that was not consistent with the advice that the LFB was giving or should have been giving in accordance with its policies. **I therefore recommend** that the LAS and the MPS review their protocols and policies to ensure that their operators can identify FSG calls (as defined by the LFB) and pass them to the LFB as soon as possible.

10 Command and control

- 33.18 The evidence of the way in which firefighters were deployed indicates that those in command exercised insufficient control over their actions to ensure that resources were used efficiently. Too often firefighters or junior officers acted on their own initiative, resulting in confusion and duplication of effort. In many cases instructions to crews deployed into the building were not carried out because firefighters came across people needing help and departed from their instructions in order to carry out what they regarded as a more important task. **I therefore recommend:**
- that the LFB develop policies and training to ensure better control of deployments and the use of resources;
 - that the LFB develop policies and training to ensure that better information is obtained from crews returning from deployments and that the information is recorded in a form that enables it to be made available immediately to the incident commander (and thereafter to the command units and the control room).
- 33.19 LFB policies recognise that regular communication between the control room and the incident commander and between the incident commander and the bridgehead are essential to successful firefighting and rescue operations, particularly when dealing with large-scale incidents. However, at Grenfell Tower there was no regular communication between the control room and the incident commander or between the incident commander and the bridgehead. **I therefore recommend** that the LFB develop a communication system to enable direct communication between the control room and the incident commander and improve the means of communication between the incident commander and the bridgehead.
- 33.20 The methods used for transmitting from the control room to the bridgehead information about people needing rescue were disorganised and the line of communication was too extended. The arrangements for receiving and recording that information at the bridgehead were prone to failure and there was little, if any, means of capturing and transmitting to the control room information about the results of deployments to specific flats. **I therefore recommend** that the LFB investigate the use of modern communication techniques to provide a direct line of communication between the control room and the bridgehead, allowing information to be transmitted directly between the control room and the bridgehead and providing an integrated system of recording FSG information and the results of deployments.

11 Equipment

- 33.21 Some of the equipment in use by the LFB, in particular the radio equipment, was unreliable or in some cases failed to work at all. **I therefore recommend:**
- that the LFB urgently take steps to obtain equipment that enables firefighters wearing helmets and breathing apparatus to communicate with the bridgehead effectively, including when operating in high-rise buildings;

- b. that urgent steps be taken to ensure that the command support system is fully operative on all command units and that crews are trained in its use.

12 Evacuation

33.22 There were no plans in place for evacuating Grenfell Tower should the need arise.

I therefore recommend:

- a. that the government develop national guidelines for carrying out partial or total evacuations of high-rise residential buildings, such guidelines to include the means of protecting fire exit routes and procedures for evacuating persons who are unable to use the stairs in an emergency, or who may require assistance (such as disabled people, older people and young children);
- b. that fire and rescue services develop policies for partial and total evacuation of high-rise residential buildings and training to support them;
- c. that the owner and manager of every high-rise residential building be required by law to draw up and keep under regular review evacuation plans, copies of which are to be provided in electronic and paper form to their local fire and rescue service and placed in an information box on the premises;
- d. that all high-rise residential buildings (both those already in existence and those built in the future) be equipped with facilities for use by the fire and rescue services enabling them to send an evacuation signal to the whole or a selected part of the building by means of sounders or similar devices;
- e. that the owner and manager of every high-rise residential building be required by law to prepare personal emergency evacuation plans (PEEPs) for all residents whose ability to self-evacuate may be compromised (such as persons with reduced mobility or cognition);
- f. that the owner and manager of every high-rise residential building be required by law to include up-to-date information about persons with reduced mobility and their associated PEEPs in the premises information box;
- g. that all fire and rescue services be equipped with smoke hoods to assist in the evacuation of occupants through smoke-filled exit routes.

13 Personal fire protection

33.23 It has been suggested by some core participants that every flat and every public space in a high-rise residential building should be equipped with a fire extinguisher and that a fire blanket should be present in every kitchen. It has also been suggested that hose reels and fire buckets containing water or sand should be kept in the public parts of all such buildings.

33.24 On the face of it there is much to be said in favour of householders obtaining fire blankets and fire extinguishers for their own use and if they live in high-rise buildings a strong argument can be made that such equipment, if appropriately used, may provide protection not only to the occupants of the flat in which a fire occurs but to the occupants of the building as a whole. However, the view of many is that people should not be encouraged to fight fires themselves but should leave the building as quickly as possible and call the fire and rescue service. None of the experts supported the provision of fire extinguishers, hose reels or fire

buckets, which, in my view, provide obvious potential for misuse. The government publishes advice on fire safety in the home and neither the evidence nor the scope of the investigations in Phase 1 provides a basis for the suggested recommendation.

14 Sprinkler systems

- 33.25 The coroner who conducted the inquests arising out of the Lakanal House fire heard evidence about the installation of sprinklers and recommended that the government encourage housing providers responsible for high-rise buildings containing multiple domestic premises to consider fitting them. It is not surprising, therefore, that some core participants have urged me to go a step further and to recommend that such systems be installed in all existing high-rise residential buildings.
- 33.26 Sprinkler systems no doubt have a very valuable part to play in the overall scheme of fire safety measures, but whether such a system would be likely to have suppressed the fire in Flat 16 or prevented it from escaping into the cladding before the firefighters could extinguish it is not something that was investigated in Phase 1. I have therefore heard no evidence about the use of sprinklers generally, their effectiveness under different conditions, or about the cost and disruption that would be caused by installing them in existing buildings. In those circumstances I cannot make any recommendation at this stage about the installation of sprinklers in existing buildings, although the government's response to previous recommendations will form an important part of the investigation to be carried out at Phase 2.

15 Internal signage

- 33.27 The landings in the staircase at Grenfell Tower were not clearly marked with the relevant floor number and where floor numbers were marked they did not reflect the additional floors created during the refurbishment. As a result, firefighters were unable to identify floors clearly when carrying out firefighting or search and rescue operations within the building. **I therefore recommend** that in all high-rise buildings floor numbers be clearly marked on each landing within the stairways and in a prominent place in all lobbies in such a way as to be visible both in normal conditions and in low lighting or smoky conditions.
- 33.28 The evidence put before me in Phase 1 indicates that many occupants of Grenfell Tower were unable to read or understand the fire safety instructions placed in the lobbies throughout the building. Such information is important because it helps to save lives. In the case of Grenfell Tower, fire safety advice was prominently displayed in the lobbies, but it was written only in English, despite the fact that many of the occupants were unable to read English easily or at all. These considerations apply to residential buildings of all kinds containing separate dwellings. **I therefore recommend** that the owner and manager of every residential building containing separate dwellings (whether or not it is a high-rise building) be required by law to provide fire safety instructions (including instructions for evacuation) in a form that the occupants of the building can reasonably be expected to understand, taking into account the nature of the building and their knowledge of the occupants.

16 Fire doors

- 33.29 In Phase 2, the Inquiry will investigate the extent to which at the time of the fire the entrance doors to the flats in Grenfell Tower complied with the relevant legislative requirements and, to the extent that they did not, will investigate the reasons for that failure. However, it has already become apparent from the evidence obtained in Phase 1 that ineffective fire doors allowed smoke and toxic gases to spread through the building more quickly than should have

been possible. One important reason why fire doors failed to perform their essential function was the absence of effective self-closing devices, some of which were broken or had been disabled or removed. Fire doors play an essential role in preventing or inhibiting the spread of smoke and toxic gases and in preserving effective compartmentation of buildings. In many cases they are critical to saving life. **I therefore recommend:**

- a. that the owner and manager of every residential building containing separate dwellings (whether or not they are high-rise buildings) carry out an urgent inspection of all fire doors to ensure that they comply with applicable legislative standards;
- b. that the owner and manager of every residential building containing separate dwellings (whether or not they are high-rise buildings) be required by law to carry out checks at not less than three-monthly intervals to ensure that all fire doors are fitted with effective self-closing devices in working order.

33.30 Effective fire doors are particularly important in those high-rise buildings that are exposed to an increased risk of fire because the external walls currently incorporate unsafe cladding. Among the experts, views differ about the desirability of requiring existing fire doors to be brought up to modern standards and if necessary be replaced with doors that comply with the requirements currently in force in relation to new buildings. However, the importance of fire doors in maintaining compartmentation and protecting parts of the building other than that in which a fire has occurred is plain and in my view justifies the expense that would inevitably be incurred. **I therefore recommend** that all those who have responsibility in whatever capacity for the condition of the entrance doors to individual flats in high-rise residential buildings, whose external walls incorporate unsafe cladding, be required by law to ensure that such doors comply with current standards.

17 Co-operation between emergency services

33.31 A point of concern that has emerged from the evidence heard in Phase 1 is that the emergency services failed to co-ordinate with each other and share information as intended, particularly during the early phases of the incident. Most seriously, each declared a Major Incident without immediately informing the others that it had done so. These failures represent weaknesses in the arrangements under which Category 1 Responders are to work together in response to a serious incident. **I therefore recommend** that the Joint Doctrine be amended to make it clear:

- a. that each emergency service must communicate the declaration of a Major Incident to all other Category 1 Responders as soon as possible;
- b. that on the declaration of a Major Incident clear lines of communication must be established as soon as possible between the control rooms of the individual emergency services;
- c. that a single point of contact should be designated within each control room to facilitate such communication;
- d. that a “METHANE” message should be sent as soon as possible by the emergency service declaring a Major Incident.

- 33.32 The MPS and the LAS have access to each other's CAD logs but neither was accessible to the LFB. Co-operation between the emergency services would be improved if the LFB had access to the CAD logs of the MPS and LAS. **I therefore recommend** that steps be taken to investigate the compatibility of the LFB systems with those of the MPS and the LAS with a view to enabling all three emergency services' systems to read each other's messages.
- 33.33 Although an NPAS helicopter was deployed to observe the development of the fire, the pictures it transmitted could not be viewed by the LFB because the encryption was incompatible with its receiving equipment. Incident commanders and CROs responding to emergency calls might have been assisted by seeing those pictures and in any event they should be available to fire and rescue services as a matter of routine. **I therefore recommend** that steps be taken to ensure that the airborne datalink system on every NPAS helicopter observing an incident which involves one of the other emergency services defaults to the National Emergency Service user encryption.
- 33.34 Many people had difficulty in establishing the whereabouts of friends and relatives who had been taken to hospital after escaping from the building. It is important that in the aftermath of a disaster people are able to ascertain as quickly as possible where their loved ones are and are able to make contact with them. **I therefore recommend** that the LFB, the MPS, the LAS and the London local authorities all investigate ways of improving the collection of information about survivors and making it available more rapidly to those wishing to make contact with them.

18 Other matters

- 33.35 Some of the core participants suggested that I should make recommendations on a range of other matters, including amendments to the Regulatory Reform (Fire Safety) Order 2005 to ensure that it applies to the external walls of residential buildings and the testing and certification of building materials. Although they are all matters of potential importance, none of them were examined in the course of Phase 1 and cannot therefore be the subject of recommendations in this report.

Chapter 34

Looking Ahead to Phase 2

1 Introduction

- 34.1 Having completed Phase 1 of the Inquiry it is useful to look ahead briefly to Phase 2 to identify some areas that will be of particular interest and importance and some that will not now call for investigation to the degree previously thought likely. Most of the questions on which attention will be focused closely relate to the building itself, but it is appropriate to begin with a reminder that important work remains to be done in order to complete the Inquiry's findings about the circumstances in which the deceased lost their lives.

2 The deceased

- 34.2 At the beginning of the Inquiry I expressed the hope that I would be able in due course to make sufficient findings about those who died and the circumstances in which they met their deaths to make it unnecessary for the coroner to resume the investigations which she opened in 2017. I had hoped to be able to make findings in this report in relation to all those matters, save for the wider circumstances that would in any event be the subject of investigation in Phase 2. However, although it has been possible for me to find many of the relevant facts, it has become clear that some aspects of the circumstances in which the deceased met their deaths require a more detailed examination of the evidence than has yet been possible. Within Phase 2 there will therefore be an examination of the evidence relating to the circumstances in which the deceased met their deaths generally with a view to making the findings which the coroner requires.

3 The remaining scope of Phase 2

- 34.3 I decided to begin the Inquiry with an investigation of the events which occurred during the night of the fire because only a detailed understanding of what had happened would enable me to identify effectively those aspects of the design, construction and management of the building that were primarily responsible for the disaster. As a result of the investigations carried out in Phase 1 it has become clear that some aspects of the building played a more significant role than others in bringing about the events which occurred on 14 June 2017.
- 34.4 Since the primary cause of the rapid spread of fire up, around and down the building was the use of ACM rainscreen panels with a polyethylene core, to which the use of combustible insulation contributed, the principal focus of Phase 2 will be on the decisions which led to the installation of a highly combustible cladding system on a high-rise residential building and the wider background against which they were taken. However, a number of other matters have emerged from the evidence gathered in Phase 1 which, although not yet fully explored (and therefore not capable of being the subject of findings at this stage), also give rise to significant concern and call for more detailed investigation. I identify below some of those that I consider particularly important, but must emphasise that it is not an exhaustive list.

4 Matters of particular concern

The London Fire Brigade

- 34.5 In the preceding chapters of this report I have referred to a number of respects in which the performance of the LFB fell below the standards set by its own policies or national guidance. In the case of the control room, there were signal failures to comply with policies that had been recently introduced or modified in response to criticisms of its performance in connection with the Lakanal House fire, giving rise to justified concern that the LFB as an institution had failed to learn or put into practice the lessons of that event. The need for regular active communication between the control room and the incident ground to exchange information about the development of the fire, although required by policies PN633 and PN790, appears to have been routinely ignored. There appears to have been a failure properly to understand the risk of cladding fires in high-rise buildings, despite the fact that by 2017 many buildings of a similar kind in other countries had suffered fires in cladding, some of which had been well publicised. Although some senior officers in the LFB had become aware of the risk, as appears from the *Tall Building Facades* presentation, there had been no attempt to disseminate the information to potential incident commanders and no attempt to equip them with the knowledge or skills needed to recognise and respond to such fires. Questions have also been raised about the LFB's understanding of the nature of the obligation imposed by section 7(2)(d) of the 2004 Act and its approach to discharging it. In that context, as in many others, there appears to have been a significant divergence between policy and practice.
- 34.6 These and other shortcomings described earlier in this report raise far-reaching questions about the LFB as an organisation. Some may question whether its training is adequate in the light of experience; others may question whether it is capable of learning from its mistakes. No conclusion can be reached on questions of that kind at this stage because there has been no examination of the way in which the LFB is managed and no opportunity to question those who are responsible at the highest level for its operations about these apparent shortcomings. However, they are matters of the greatest importance to all who live and work in the capital and will be an important aspect of Phase 2 of the investigation.

Testing and certification of materials

- 34.7 In the light of the expert evidence, in particular Dr Barbara Lane's supplemental report, there are already grounds for thinking that the current regime for testing the combustibility of materials and cladding systems, particularly those chosen for use in high-rise buildings, may be neither as rigorous nor as effectively enforced as it should be. Doubts have also arisen about the reliability of the certification of certain materials for use in high-rise buildings. Grave concern inevitably arises simply from the fact that it was possible for highly combustible materials to be used for the purposes of refurbishing and cladding a building like Grenfell Tower. How that was possible is a question that may be relevant to many aspects of the construction industry, including manufacturers of products currently widely available on the market. Pending further investigation it would clearly be sensible for anyone who is responsible for the fire safety of an existing building or who is considering the use of products on high-rise buildings to scrutinise the information about them provided by the manufacturers and exercise considerable care to ensure that they meet the required standards. These concerns extend to the adequacy of the regulations themselves, the quality of the official statutory and non-statutory guidance currently available, the effectiveness of the tests currently in use, the

arrangements for certifying the compliance of materials with combustibility criteria and the manner in which materials are marketed. They are questions that will lie at the heart of the Inquiry's investigations in Phase 2.

Design and choice of materials

- 34.8 A number of aspects of the design of the refurbishment and the choice of materials will need to be examined. The choice of ACM panels with a polyethylene core, the choice of combustible insulation and XPS window infill panels, a design which incorporated many vertical channels and the decision to incorporate an architectural crown composed of ACM fins, all of which made a major contribution to the extent of the fire, are just examples. An examination of the relevant building regulations and the guidance to the construction industry published by the government in support of them will form an important part of this aspect of the Inquiry's work.

Fire doors

- 34.9 In her supplemental report Dr Lane drew attention to serious questions that arise in relation to the fire doors throughout the tower, both the entrance doors to individual flats opening into the lobbies and the doors opening from the lobbies into the stairs. In Phase 2 it will be necessary to investigate whether those doors complied with the regulations and guidance applicable at the time they were installed, whether they were able to provide appropriate protection against the spread of fire and smoke and if not, why that was so. There is evidence that in many cases self-closing devices were broken or had been disconnected, rendering the doors useless if left open in an emergency. It will be necessary to investigate how that situation came about and why it was allowed to continue.

Window arrangements

- 34.10 As part of the refurbishment the windows were moved outwards so that they no longer sat flush with the original concrete wall but flush with the new cladding system. That alteration, together with the materials used in creating the window surrounds, created certain weaknesses to which Dr Lane and Professor José Torero drew attention. In particular, the use of uPVC in close proximity to combustible insulation and other materials of a combustible nature made it possible for the fire to escape into the cladding from its original location in the kitchen of Flat 16. The design of the window arrangements will therefore be another important focus of investigation in Phase 2.

Lifts

- 34.11 The lifts in Grenfell Tower appear to have been designed as "fire lifts" and lacked some of the protective features such as a secondary power supply, water ingress protection, or FD60 performance for the lift landing doors which would be present in "firefighting lifts".² They did, however, include a "fireman's switch", which should have enabled the firefighters to take control of them and prevent further use by the occupants of the building. In the event, the firefighters were unable to take control of the lifts, but they were able to use them in their normal mode of operation to take crew and equipment up to the bridgehead on floor 2.³ It does not appear, therefore, that their inability to take control of the lifts significantly affected their operations, but the lifts remained available for use by occupants, as described earlier, in

² Dr Lane explained the difference between a "firefighter lift" and a "fire lift" at p. 116 in her presentation on 18 June 2018. Refer also to [BLAS0000033] p. 7, 10 Figs. L1 and L2.

³ Dr Lane supplemental report [BLAS0000019] p. 25 19.5.71.

some cases with fatal consequences. Given the importance of such equipment to safety in a high-rise building, it is necessary in Phase 2 to investigate whether the lifts were appropriately maintained and, in particular, why the fireman's switch apparently did not work properly on this occasion.

Smoke extraction system

- 34.12 Suggestions have been made that the smoke extraction system failed to operate in accordance with its design and even contributed to the spread of smoke between different floors of the building. Systems of this kind are an integral part of the fire safety measures in most, if not all, high-rise buildings. Although the system at the tower was designed to operate on only one floor and was not intended to deal with smoke extraction on multiple floors at the same time, it is important to understand whether, in this case, it was capable of operating in accordance with its design and whether it did so. These questions will therefore form part of the investigation in Phase 2.

The warnings of the local community and the authorities' response to the disaster

- 34.13 From the outset members of the local community have said that they warned the TMO on many occasions about fire hazards, both those arising from the refurbishment and more generally. There is a strong feeling among them that their voices were ignored and that if attention had been paid to them the disaster could have been avoided. There is also a strong view in many quarters that in their response to the disaster the authorities failed the community by not providing adequate support in the days immediately following the fire. These are both important matters for further investigation in Phase 2, not least because they reflect what is said to be a general lack of concern on the part of the authorities for the residents of the tower and the wider community.

5 Matters no longer requiring investigation

Stairs

- 34.14 A question was raised about the width of the stairs, given that they provided the sole means of access to the upper floors of the tower for firefighters as well as the sole means of escape for the occupants. However, the stairs appear to have complied with requirements of the legislation in force at the time of their construction and the expert evidence supports the conclusion that they had sufficient capacity to enable all the occupants of the building to escape within a reasonable time. This aspect of the building will not, therefore, be the subject of further investigation in Phase 2.

Gas

- 34.15 It was thought at one time that the supply of gas to the tower might have played a significant part in the outbreak and development of the fire, but as a result of the investigation carried out in Phase 1 it has become clear that that was not the case. Although the supply of gas allowed fires within individual flats to continue to burn until it was shut off at 23.40 that day, its contribution to the fire which consumed the tower appears to have been minimal. However, some works associated with the installation of the new gas riser were incomplete and may have contributed to the spread of smoke. In those circumstances it will be necessary at Phase 2 to consider whether the installation of the gas services complied with the relevant regulatory regime, but the focus of those investigations can be relatively narrow.

Electricity

- 34.16 There was a widespread suspicion, based on events that were said to have occurred in 2013, that the fire had been caused by a surge in the supply of electrical power to the building. In the event, no evidence has emerged to support that suspicion and I am confident that the true cause of the initial outbreak of fire has been correctly identified in Chapter 21. As a result, I do not think it necessary to undertake any further investigation into that aspect of the matter.

