

Grenfell Tower Inquiry

GRENFELL TOWER INQUIRY: PHASE 2 REPORT

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

The Panel:

Chairman: The Rt Hon Sir Martin Moore-Bick

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which some may find distressing.**



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Chapter 2

Executive summary

- 2.1** This chapter contains an overview of the contents of our report. Our terms of reference were broad and we have followed many lines of inquiry, sometimes with unexpected results. The report is therefore inevitably lengthy and detailed. It is not possible to summarise the whole of its contents in a few pages and we have not tried to do so. The purpose of this chapter is to describe in broad terms the contents of the report and the main conclusions we have reached about the events that culminated in the tragedy at Grenfell Tower. We hope that it will assist readers in understanding the scope of the report and directing their attention to the parts of greatest interest to them. However, there is no substitute for reading the report itself.
- 2.2** For ease of reference we have referred to the contents of the report under headings that correspond to those of its various Parts.

Part 2

The path to disaster (Chapters 3 – 14)

- 2.3** In this Part of the report we describe the course of events leading up to the fire, beginning with the regulatory regime and its development in relation to the external walls of high-rise buildings. We describe the part played by the government in the form of the then Department for Communities and Local Government in the development of the statutory guidance and the investigation into the fire at Lakanal House, Southwark in 2009. We also describe the parts played by other influential bodies in creating the circumstances in which refurbishment of Grenfell Tower took place.
- 2.4** We conclude that the fire at Grenfell Tower was the culmination of decades of failure by central government and other bodies in positions of responsibility in the construction industry to look carefully into the danger of incorporating combustible materials into the external walls of high-rise residential buildings and to act on the information available to them.

The government

- 2.5** In the years between the fire at Knowsley Heights in 1991 and the fire at Grenfell Tower in 2017 there were many opportunities for the government to identify the risks posed by the use of combustible cladding panels and insulation, particularly to high-rise buildings, and to take action in relation to them. Indeed, by 2016 the department was well aware of those risks, but failed to act on what it knew. In particular, it failed to heed the warning of the Environment and Transport Select Committee in December 1999 that it should not take a serious fire in which people were killed before steps were taken to minimise the risks posed by some external cladding systems. It also failed to implement or keep under review the committee's recommendation that the large-scale test that had recently been developed should be substituted in Approved Document B for previous requirements relating to the fire safety of external cladding systems (thereby abandoning Class 0).
- 2.6** The department also failed to pay due regard to the striking results of a large-scale test in 2001 involving aluminium composite panels with unmodified polyethylene cores, which burned violently, or to take any steps either to ascertain the extent to which panels of that kind were in

use or to warn the construction industry about the risks they posed. It failed even to publish the results of the test.

- 2.7** On many subsequent occasions the department was made aware that national Class 0 was an inappropriate standard by which to determine the suitability of external wall panels but allowed it to remain as part of the statutory guidance until after the Grenfell Tower fire. It could and should have been removed years earlier.
- 2.8** The review of Approved Document B carried out by the department between 2005 and 2006 provided an opportunity to clarify the guidance on compliance with functional requirement B4(1), but the language used was vague and ill-considered words were added at a late stage in the process without proper consultation.
- 2.9** Between 2012 and 2017 the department received numerous warnings about the risks involved in using polymeric insulation and aluminium composite panels with unmodified polyethylene cores. It also became aware of several major cladding fires abroad involving products of those kinds. By 2013 at the latest, it knew that Approved Document B was unclear and not properly understood by a significant proportion of those working in the construction industry and by February 2016 it had become aware that some

in the industry were worried that combustible insulation and aluminium composite material (ACM) panels with unmodified polyethylene cores were routinely being used on high-rise buildings in breach of functional requirement B4. However, despite what it knew, and the warnings it received from some quarters, the department failed to amend or clarify the guidance in Approved Document B on the construction of external walls.

- 2.10** The department itself was poorly run, in as much as the official with day-to-day responsibility for the Building Regulations and Approved Document B was allowed too much freedom of action without adequate oversight. He failed to bring to the attention of more senior officials the serious risks of which he had become aware, and they in turn failed to supervise him properly or to satisfy themselves that his response to matters affecting the safety of people's lives was appropriate. It was a serious failure to allow such an important area of activity to remain in the hands of one relatively junior official.
- 2.11** The Building Research Establishment (originally known as the Fire Research Station) had been established in 1921 as a government body to carry out research into and testing of construction methods and products. After it was privatised in 1997 the department limited the scope of the

advice it was asked to provide on fire safety matters. As a result, the department deprived itself of the full benefit of BRE's advice and experience. On occasions it deliberately curtailed investigations before any proper conclusion had been reached.

- 2.12** The department displayed a complacent and at times defensive attitude to matters affecting fire safety. Following the fire at Lakanal House the coroner recommended that Approved Document B be reviewed, but her recommendations were not treated with any sense of urgency and officials did not explain clearly to the Secretary of State what steps were required to comply with them. Similarly, legitimate concerns about the fire risks of cladding raised by the All-Party Parliamentary Group on Fire Safety were repeatedly met with a defensive and dismissive attitude by officials and some ministers.
- 2.13** In the years that followed the Lakanal House fire the government's deregulatory agenda, enthusiastically supported by some junior ministers and the Secretary of State, dominated the department's thinking to such an extent that even matters affecting the safety of life were ignored, delayed or disregarded.

2.14 During that period the government determinedly resisted calls from across the fire sector to regulate fire risk assessors and to amend the Fire Safety Order to make it clear that it applied to the exterior walls of buildings containing more than one set of domestic premises. Although it commissioned a review of the advice in the Local Government Association Guide *Fire safety in purpose-built blocks of flats* relating to the evacuation of vulnerable people, it failed to consult those who represented their interests.

The Building Research Establishment

2.15 BRE held a trusted position within the construction industry and was recognised both nationally and internationally as a leader in fire safety. However, from 1991 much of the work it carried out in relation to testing the fire safety of external walls was marred by unprofessional conduct, inadequate practices, a lack of effective oversight, poor reporting and a lack of scientific rigour.

2.16 Although BRE recognised from as early as 1991, following the fire at Knowsley Heights, that small-scale testing of the kind that provided the basis for national Class 0 did not enable a proper assessment to be made of the way in which an external wall system would react to fire, it did not draw that to the government's attention, formally or informally. Similarly, following

its large-scale test of a system incorporating aluminium composite panels with unmodified polyethylene cores in 2001, BRE failed to draw the department's attention in clear terms to the way in which the material had behaved and the dangers it presented.

- 2.17** BRE's reports into the major fires at Knowsley Heights (1991), Garnock Court (1999) and The Edge (2005) were far from comprehensive and in each case failed to identify or assess important contributory factors. The reports of fires it provided to the department were characterised by superficiality and a lack of analysis, with the result that they gave the department the false impression that the regulations and guidance were working effectively.
- 2.18** There were weaknesses in the way BRE carried out tests in accordance with BS 8414 and in its record-keeping, which exposed it to the risk of manipulation by unscrupulous product manufacturers, as happened in the case of the second test carried out for Celotex, the manufacturer of the insulation specified for use on Grenfell Tower. Senior BRE staff gave advice to customers such as Kingspan and Celotex on the best way to satisfy the criteria for a system to be considered safe, thereby compromising its integrity and independence. In some cases we saw evidence of a desire to accommodate

existing customers and to retain its status within the industry at the expense of maintaining the rigour of its processes and considerations of public safety. The unprofessional behaviour of some of BRE's staff was in part the result of a failure to provide them with adequate training in their responsibilities.

Part 3

The testing and marketing of products (Chapters 15 – 29)

- 2.19** One very significant reason why Grenfell Tower came to be clad in combustible materials was systematic dishonesty on the part of those who made and sold the rainscreen cladding panels and insulation products. They engaged in deliberate and sustained strategies to manipulate the testing processes, misrepresent test data and mislead the market. In the case of the principal insulation product used on Grenfell Tower, Celotex RS5000, the Building Research Establishment (BRE) was complicit in that strategy.
- 2.20** Those strategies succeeded partly because the certification bodies that provided assurance to the market of the quality and characteristics of the products, the British Board of Agrément (BBA) and Local Authority Building Control (LABC), failed to ensure that the statements in their product certificates were accurate and based on test evidence. UKAS, the body charged with oversight of the certification bodies, failed to apply proper standards of monitoring and supervision.

Arconic Architectural Products

- 2.21** Arconic Architectural Products manufactured and sold the Reynobond 55 PE rainscreen panels used in the external wall of Grenfell Tower. They were an ACM product made of two thin sheets of aluminium with a polyethylene core to provide stiffening. The material was manufactured and sold in flat sheets designed to be cut to size and attached to a metal sub-frame, either as flat panels by rivets or as three-dimensional structures, known as cassettes, by slots, making use of the force of gravity. Polyethylene burns fiercely and when used in cassette form Reynobond 55 PE was extremely dangerous.¹ From 2005 until after the Grenfell Tower fire Arconic deliberately concealed from the market the true extent of the danger of using Reynobond 55 PE in cassette form, particularly on high-rise buildings.²
- 2.22** The product in its riveted form had been classed under the European classification system B-s2, d0, but from early 2005 Arconic had been in possession of test data showing that in its cassette form the product reacted to fire in a very dangerous way and could not be classified in accordance with European standards.

¹ See in particular Part 11 chapter 109.

² See Part 3 Chapters 16 to 21.

Nonetheless, Arconic persisted in telling the market that the panels had been classed B-s2, d0 without drawing any distinction between the cassette and riveted forms.

- 2.23** By late 2007 Arconic had become aware that there was serious concern in the construction industry about the safety of ACM panels and had itself recognised the danger they posed. By the summer of 2011 it was well aware that Reynobond 55 PE in cassette form performed much worse in a fire and was considerably more dangerous than in riveted form. Nonetheless, it was determined to exploit what it saw as weak regulatory regimes in certain countries (including the UK) to sell Reynobond 55 PE in cassette form, including for use on residential buildings.
- 2.24** Despite the knowledge gained from cladding fires in Dubai in 2012 and 2013, Arconic did not consider withdrawing Reynobond 55 PE in favour of the fire-resistant version then available. Instead, it allowed customers in the UK to continue buying the unmodified product, giving them to understand that it would tell them if it was unsuitable for the use to which they intended to put it, although without any intention of doing so.
- 2.25** Following further testing in 2013, Arconic decided that Reynobond 55 PE would be certified as Class E only, whether used in riveted or cassette

form. However, it did not pass that information to its customers in the UK or to the BBA. That was not an oversight. It reflected a deliberate strategy to continue selling Reynobond 55 PE in the UK based on a statement about its fire performance that it knew to be false.

- 2.26** In December 2014 the French testing house Centre Scientifique et Technique du Bâtiment (CSTB) classified the panels in riveted form as Class C and the panels in cassette form as Class E. However, Arconic failed to inform the BBA of those revised classifications.
- 2.27** Although Reynobond 55 PE required some degree of fabrication and could not be used in the form in which it left the factory, Arconic persuaded the BBA to issue a certificate that drew no distinction between the different forms of fixing. It concealed important information from the BBA, in particular the test data relating to the product in cassette form, that showed that it performed much worse than in riveted form. It caused the BBA to make statements in the certificate that Arconic knew to be false and misleading.

Celotex

- 2.28** Celotex manufactured RS5000, a combustible polyisocyanurate foam insulation. In an attempt to break into the market for insulation suitable

for use on high-rise buildings, created and then dominated by Kingspan K15, Celotex embarked on a dishonest scheme to mislead its customers and the wider market.³

- 2.29** With the complicity of BRE, in May 2014 Celotex tested in accordance with BS 8414 a system incorporating RS5000 that contained two sets of fire-resistant magnesium oxide boards placed in critical positions to ensure that it passed. It then obtained from BRE a test report that omitted any reference to the magnesium oxide boards, thereby rendering it materially incomplete and misleading.
- 2.30** Celotex then marketed RS5000 as “the first PIR board to successfully test to BS 8414”, and as “acceptable for use in buildings above 18 metres in height”. However, the test on which Celotex relied in support of that claim had been manipulated as we have described above, a fact that Celotex did not disclose in its marketing literature. Moreover, BS 8414 is a system test and does not involve the testing or classification of individual products. Celotex deliberately tucked that information away in the small print of its marketing literature.

³ See Part 3 Chapters 24 and 25.

2.31 RS5000 had previously been marketed as FR5000. From 2011 it had been sold as having Class 0 fire performance “throughout”, a claim which was false and misleading. Celotex presented RS5000 to Harley as suitable and safe for use on Grenfell Tower, although it knew that was not the case.

Kingspan

2.32 From 2005 until after this Inquiry had begun, Kingspan knowingly created a false market in insulation for use on buildings over 18 metres in height by claiming that K15 had been part of a system successfully tested under BS 8414 and could therefore be used in the external wall of any building over 18 metres in height regardless of its design or other components. That was a false claim, as it well knew, because BS 8414 is a method for testing complete wall systems and its results apply only to the particular system tested. As Kingspan knew, K15 could not honestly be sold as suitable for use in the external walls of buildings over 18 metres in height generally, but that is what it had succeeded in doing for many years.⁴

⁴ See Part 3 Chapters 22 and 23.

- 2.33** In marketing K15 Kingspan relied on the results of a single BS 8414-1 test performed in 2005 on a system whose components were not representative of a typical external wall and it continued to rely on that test without disclosing that it had changed the composition of the product in 2006. Tests performed in 2007 and 2008 on systems incorporating the then current form of K15 were disastrous, but Kingspan did not withdraw the product from the market, despite its own concerns about its fire performance.
- 2.34** Kingspan concealed from the BBA the fact that the product it was selling, to which the certificate issued in 2008 referred, differed from the product that had been incorporated into the system tested in 2005. Moreover, the BBA certificate contained three important statements about the fire performance of K15 that were untrue. It used a form of words suggested by Kingspan and drawn from its own marketing literature.
- 2.35** In 2009 Kingspan succeeded in obtaining from the LABC a certificate that contained false statements about K15 and supported its use generally on buildings over 18 metres in height. Kingspan relied on that certificate for many years to sell the product. It made a calculated decision to use the LABC certificate to mask, or distract from, the absence of supporting test evidence.

- 2.36** When the BBA certificate was re-issued in 2013, Kingspan persuaded the BBA to include a statement that K15 complied with paragraph 12.7 of Approved Document B, which wrongly implied that it was a product of limited combustibility.
- 2.37** When it did return to carrying out tests on systems incorporating K15, Kingspan did not use the product currently on the market but used modified or trial versions. It dishonestly relied on the results of those tests to support the sale of K15 for use on buildings over 18 metres in height and continued to do so until October 2020.
- 2.38** Kingspan's claim that K15 met the requirements for Class 0 was based on a test of the foil facer alone and was disingenuous.
- 2.39** Kingspan cynically exploited the industry's lack of detailed knowledge about BS 8414 and BR 135 and relied on the fact that an unsuspecting market was very likely to rely on its own claims about the product, not least because the BBA certificate directed the buyer to consult Kingspan in relation to its use on buildings over 18 metres in height.

Siderise

- 2.40** Siderise manufactured the Lamatherm cavity barriers used in the refurbishment. Although there is no evidence of any dishonesty on its part, some aspects of its marketing materials gave

cause for concern. It also supplied cavity barriers for use in voids larger than those for which they had been tested.

The British Board of Agrément

- 2.41** The British Board of Agrément (BBA) is a commercial organisation that certifies the compliance of products with the requirements of legislation. It issued certificates of compliance in respect of one of the insulation products used on Grenfell Tower, Kingspan K15, and the Reynobond 55 PE panels used as the rainscreen. Its certificates were accepted in the industry largely without question but its procedures were neither wholly independent nor rigorous and were not always rigorously applied.
- 2.42** The dishonest strategies of Arconic and Kingspan succeeded in a large measure due to the incompetence of the BBA, its failure to adhere robustly to the system of checks it had put in place, and an ingrained willingness to accommodate customers instead of insisting on high standards and adherence to a contract that was intended to maintain them. As a result of systemic shortcomings and inadequate levels of competence and technical expertise among its staff, its scrutiny of the fire performance of K15

and Reynobond 55 PE was seriously deficient and the certificates it produced for those products were misleading.

- 2.43** The underlying problem was that the BBA failed to manage the conflict between the need to act as a commercial organisation in order to attract and retain customers and the need to exercise a high degree of rigour and independence in its investigations in order to satisfy those who might consider relying on its certificates. It accepted for inclusion in certificates forms of wording proposed by manufacturers that were wrong and misleading. Its lack of robust processes and reluctance to enforce the terms of its contracts enabled it to become the victim of dishonest behaviour on the part of unscrupulous manufacturers.
- 2.44** So far as Reynobond 55 PE was concerned, the certificate issued by the BBA in 2008 contained false statements, including that the product “may be regarded as having a Class 0 surface”. The BBA accepted the results of tests carried out on a different product. It failed to take advice from BRE when drafting the certificate. It completed and approved periodic reviews and re-issued the certificate without having received any new information, despite having asked Arconic

repeatedly to provide it. It failed to suspend or withdraw the certificate in response to Arconic's failure to co-operate.

- 2.45** Until December 2013 the BBA effectively allowed the contents of the certificates relating to Kingspan K15 to be dictated by Kingspan itself, including the requirement to seek advice from Kingspan in relation to the use of the product on buildings over 18 metres in height. The BBA did not assess any aspect of the product's manufacture, testing or fire performance before it issued the certificate. It did not obtain any test data relating to K15 before it issued a certificate containing a statement that the product had been classified as national Class 0, since none existed. It ought to have known that the statement in the revised certificate issued in July 2013 implying that K15 was a material of limited combustibility was false because K15 was a phenolic foam product.

Local Authority Building Control

- 2.46** Local Authority Building Control (LABC) is a body formed by local authority building control departments in 2005 to provide support with training and technical matters and to provide centralised marketing and business development services for members. Following an initial assessment by a local authority building control

surveyor and a second stage review by a group of experts, it issued certificates verifying the compliance of construction products and systems with the Building Regulations and Approved Documents.

- 2.47** The LABC must take its share of the blame for the acceptance by the market of Celotex RS5000 and Kingspan K15 for use on buildings over 18 metres in height. There was a complete failure on the part of the LABC over a number of years to take basic steps to ensure that the certificates it issued in respect of them were technically accurate.
- 2.48** The LABC was vulnerable to manipulation because its processes were not implemented rigorously enough. The task of producing an initial assessment should not have been given to building control officers, who did not have the degree of knowledge and experience necessary to make an informed assessment of the product in question, and those who carried out the second stage review were not always competent to do so and in some cases did not take the necessary degree of care.
- 2.49** Over a period of some years the LABC's certificates relating to Kingspan K15 and Celotex RS5000 contained misleading statements about their fire performance and about the suitability of both products for use in the external walls

of buildings over 18 metres in height. Despite warnings from various quarters, the LABC failed to scrutinise properly the claims made for the products by the manufacturers and instead adopted uncritically the language they suggested. In short, it was willing to accommodate the customer at the expense of those who relied on the certificates. As a result, the LABC was also the victim of dishonest behaviour on the part of unscrupulous manufacturers.

The National House Building Council

2.50 The National House Building Council (NHBC) employed a large number of Approved Inspectors through whom it provided building control services to a large part of the housing construction industry. It also wielded considerable influence on the industry through its membership of the Building Control Alliance, a body established in 2008 to promote the role of building control bodies, and its publication of guidance notes. However, it failed to ensure that its building control function remained essentially regulatory and free of commercial pressures. It was unwilling to upset its own customers and the wider construction industry by revealing the scale of the use of combustible insulation in the external walls of high-rise buildings, contrary to the statutory guidance. We have concluded that the conflict

between the regulatory function of building control and the pressures of commercial interests prevents a system of that kind from effectively serving the public interest.

The Building Research Establishment

- 2.51** BRE played an important part in enabling Celotex and Kingspan to market their products for use in the external walls of buildings over 18 metres in height. BRE's systems were not robust enough to ensure complete independence and the necessary degree of technical rigour at all times. As a result, it sacrificed rigorous application of principle to its commercial interests. From 2004 it had engaged in discussions with Kingspan about the steps it might take to ensure that a system incorporating K15 met the performance requirements, and during the test of a system incorporating K15 in March 2014 it gave advice on its performance, including how the results of the test might be interpreted. It accepted the inclusion of magnesium oxide boards in the system incorporating RS5000 tested for Celotex in May 2014.

United Kingdom Accreditation Service

- 2.52** UKAS did not always follow its own policies and its assessment processes were lacking in rigour and comprehensiveness. Even when failings were

identified they were not properly explored and opportunities to improve were not always taken. The process relied too much on the candour and co-operation of the organisations being assessed and too much was left to trust. UKAS should have taken a more searching, even sceptical, attitude to the organisations it accredited. Its powers to take action were surprisingly limited, with no powers of enforcement. The most it could do in response to unsatisfactory conduct was to suspend or withdraw accreditation.

Part 4

The Tenant Management Organisation (Chapters 30 – 33)

- 2.53** The relationship between the TMO and its residents had been a troubled one for many years before the refurbishment of Grenfell Tower. Two independent reports in 2009 had drawn attention to numerous serious flaws in that relationship. The second of those reports identified governance, customer service, staff attitudes and a poor repairs service as constant themes of the investigation. It also found that the residents' lack of trust in the TMO lay at the heart of the problems. The reports made some 34 recommendations for change.
- 2.54** Despite those penetrating reports and the recommendations they contained, eight years later the TMO had shown little sign of any change and appeared to have learnt nothing about how to treat, or relate to, its residents.
- 2.55** We have concluded from all the evidence that from 2011 to 2017 relations between the TMO and many of the residents of Grenfell Tower were increasingly characterised by distrust, dislike, personal antagonism and anger. Some, perhaps many, occupants of the tower regarded the TMO as an uncaring and bullying overlord that

belittled and marginalised them, regarded them as a nuisance, or worse, and failed to take their concerns seriously. For its part, the TMO regarded some of the residents as militant troublemakers led on by a handful of vocal activists, principally Edward Daffarn, whose style they found offensive. The result was a toxic atmosphere fuelled by mistrust on both sides.

2.56 In the end, however, responsibility for the maintenance of the relationship between the TMO and the Grenfell community fell not on the members of that community, who had a right to be treated with respect, but on the TMO as a public body exercising control over the building which contained their homes. The TMO lost sight of the fact that the residents were people who depended on it for a safe and decent home and the privacy and dignity that a home should provide. That dependence created an unequal relationship and a corresponding need for the TMO to ensure that, whatever the difficulties, the residents were treated with understanding and respect. We have concluded that the TMO failed to recognise that need and therefore failed to take the steps necessary to ensure that it was met.

2.57 However irritating and inconvenient it may at times have found the complaints and demands of some of the residents of Grenfell Tower, for the TMO to have allowed the relationship

to deteriorate to such an extent reflects a serious failure on its part to observe its basic responsibilities.

Part 5

The management of fire safety at Grenfell Tower (Chapters 34 – 46)

- 2.58** RBKC and the TMO were jointly responsible for the management of fire safety at Grenfell Tower. The years between 2009 and 2017 were marked by a persistent indifference to fire safety, particularly the safety of vulnerable people. We have examined in detail a wide variety of matters that have led us to that conclusion, the most prominent of which we set out here.
- 2.59** RBKC was responsible for overseeing the TMO's activities, not monitoring its operations on a day-to-day basis, but its oversight of the TMO's performance was weak and fire safety was not subject to any key performance indicator. The absence of any independent or rigorous scrutiny by RBKC of the TMO's performance of its health and safety obligations, and in particular its management of fire safety, was a particular weakness. RBKC took little or no account of an independent and highly critical review of fire safety carried out for the TMO in 2009. It did not even know about a further independent and highly critical report produced in 2013 because the TMO had failed to disclose it to RBKC.⁵

⁵ See Part 5 Chapter 37.

- 2.60** The TMO's performance of its own functions and the effectiveness of RBKC's oversight depended on full and candid reporting by the TMO's senior management to its board. Although there was a satisfactory system for senior management to report to the board and to RBKC, it did not operate effectively because of an entrenched reluctance on the part of the TMO's chief executive, Robert Black, to inform the board and RBKC's scrutiny committees of matters that affected fire safety. That failure was all the more serious because there were chronic and systemic failings in the TMO's management of fire safety of which the board should have been made aware. Robert Black consistently failed to tell either the board or RBKC of the LFB's concerns about the TMO's compliance with the Fire Safety Order or the steps taken to enforce it.
- 2.61** First, although in 2009 an independent fire safety consultant had recommended that a fire safety strategy be prepared, nothing was done until November 2013 and a strategy had still not been finally approved by the time of the Grenfell Tower fire.
- 2.62** Secondly, the TMO's only fire assessor for its entire estate, Carl Stokes, was allowed to drift into that role without any formal selection or procurement process. He had misrepresented his experience and qualifications (some of which

he had invented) and was ill-qualified to carry out fire risk assessments on buildings of the size and complexity of Grenfell Tower, let alone to hold the entire TMO portfolio. As a result there was a danger that fire risk assessments would not meet the required standard.

- 2.63** Thirdly, although Mr Stokes' methods for carrying out fire risk assessments generally reflected the Health and Safety Executive's five steps for managing risks, the LGA Guide and PAS 79, they suffered from serious shortcomings. He often failed to check whether the TMO had taken action in response to risks he had identified in previous assessments. Despite the concerns expressed by the LFB about his competence, the TMO continued to rely uncritically on him, a situation which made the danger more acute in the absence of any arrangements for assessing the quality of his work.
- 2.64** Fourthly, there was no adequate system for ensuring that defects identified in fire risk assessments were remedied effectively and in good time. The TMO developed a huge backlog of remedial work that it never managed to clear, a situation that was aggravated by the failure of its senior management to treat defects with the seriousness they deserved. Indeed, on one occasion senior management intervened to reduce the importance attached

to the implementation of remedial measures. The demands of managing fire safety were viewed by the TMO as an inconvenience rather than an essential aspect of its duty to manage its property carefully.

- 2.65** Certain important features of the fire prevention measures at Grenfell Tower were not of an appropriate standard. For example, the new front doors installed by the TMO in 2011 and 2012 did not meet the fire resistance standards suggested by Approved Document B because the TMO had failed to specify the correct fire safety standard when ordering them.
- 2.66** Inspection and maintenance regimes affecting fire prevention systems did not reflect best practice and were inconsistently followed. Many self-closing devices on the front doors of flats in Grenfell Tower failed to work effectively and some were missing entirely. The TMO did not institute an effective inspection and maintenance programme for self-closing devices on entrance doors despite an Enforcement Notice issued by the LFB in late 2015 relating to ineffective door closers in another high-rise residential building it managed, Adair Tower, and a Deficiency Notice issued in 2016 in relation to Grenfell Tower itself on the same grounds.

- 2.67** Although the TMO had no obligation to produce a general evacuation plan, its Emergency Plan for Grenfell Tower was out of date and incomplete and did not reflect the changes brought about by the refurbishment. The TMO was well aware of that fact following a fire at Adair Tower in October 2015, but failed to address it. The absence of fire action notices in the tower was a prominent subject of complaints by residents and led to the issue of a Deficiency Notice in November 2016.
- 2.68** The Grenfell Tower fire revealed the importance of ensuring that the responsible person under the Fire Safety Order collects sufficient information about any vulnerable occupants to enable PEEPs to be prepared, when appropriate, and, in the event of a fire, appropriate measures to be taken to assist their escape. The TMO did take some steps to gather information of that kind, both before and during the refurbishment, but its data systems were not properly co-ordinated. Such information as was collected was not always used to revise its records, with the result that the spreadsheet available on the night of the fire was incomplete. The TMO's failure to collect such information amounted to a basic neglect of its obligations in relation to fire safety.

Part 6

The refurbishment of Grenfell Tower (Chapters 47– 67)

- 2.69** In this Part we trace the origins of the refurbishment project and its relationship to the Kensington Aldridge Academy and Leisure Centre (KALC) projects. We describe the persons and organisations principally involved in the project and the legislative background against which the refurbishment was carried out. We also identify two significant problems relating to Approved Document B that in our view call for urgent attention. The first is the assumption that compliance with functional requirements B3 and B4 will provide a high degree of compartmentation, thus rendering evacuation of the building unnecessary. The second is the tension between functional requirements of the Building Regulations and the prescriptive language of the guidance and the propensity of many in the industry to treat the guidance as definitive.
- 2.70** We explain how the KALC project influenced the appointment of Studio E as architect and describe the way in which the TMO manipulated the procurement process to avoid having to put the contract for architectural services out to public

tender. Artelia was appointed by the TMO as a consultant, having acted as employer's agent and quantity surveyor for the KALC project.

- 2.71** The initial plans for the refurbishment ran into difficulties because the estimated cost of the project produced by the principal contractor on the KALC project exceeded the budget by a significant margin. However, in about May 2013 the TMO's former emphasis on maintaining the momentum of the project changed to one of saving cost. That led in turn to a recommendation, reluctantly supported by Artelia, that a principal contractor should be appointed through a formal procurement process. Such a process was then implemented.
- 2.72** Although Rydon's tender was judged to be the most competitive, it still exceeded the TMO's budget. As a result, although the TMO had received advice from its lawyers that it would be improper to do so, it entered into discussions with Rydon before the procurement process had been completed leading to an agreement that, if Rydon were awarded the contract, it would reduce its price to an acceptable level.
- 2.73** Although Studio E had wanted to use zinc rainscreen panels, cost became an increasingly important consideration for the TMO and eventually an aluminium composite material

(ACM), Reynobond 55 PE, was chosen, largely on the grounds of cost. Rydon was able to offer a substantial saving through the use of ACM panels as a result of its relationship with its intended cladding sub-contractor, Harley.

- 2.74** The choice of combustible materials for the cladding of Grenfell Tower resulted from a series of errors caused by the incompetence of the organisations and individuals involved in the refurbishment. Studio E, Rydon and Harley all took a casual approach to contractual relations. They did not properly understand the nature and scope of the obligations they had undertaken, or, if they did, paid scant attention to them. They failed to identify their own responsibilities for important aspects of the design and in each case assumed that someone else was responsible for matters affecting fire safety. Everyone involved in the choice of the materials to be used in the external wall thought that responsibility for their suitability and safety lay with someone else.
- 2.75** None of those involved in the design of the external wall or the choice of materials acted in accordance with the standards of a reasonably competent person in their position. They were not familiar with or did not understand the relevant provisions of the Building Regulations, Approved Document B or industry guidance. Studio E demonstrated a cavalier attitude to the

regulations affecting fire safety and Rydon and Harley relied on their previous experience rather than on any technical analysis or expertise. The risks of using combustible materials in the external walls of high-rise buildings were well known and they should have been aware of them.

- 2.76** RBKC building control did not properly scrutinise the design or choice of materials and failed to satisfy itself that on completion of the work the building would comply with the requirements of the Building Regulations.
- 2.77** Exova was instructed by Studio E on behalf of the TMO to prepare a fire safety strategy for the building in its refurbished form. A draft was prepared but never completed. In particular, it did not include an analysis of the external wall or its compliance with functional requirement B4(1) of the Building Regulations.
- 2.78** Although our criticisms are directed principally towards Studio E, Exova, Rydon, Harley and RBKC building control, the TMO must also bear a share of the blame for the disaster because it failed to ensure that the position of Exova was clarified after Rydon had been appointed and that the fire safety strategy was completed.

- 2.79** As architect Studio E was responsible for the design of the external wall and for the choice of the materials used in its construction.⁶ Although the TMO as the client wanted to reduce the cost by using ACM rainscreen panels, it was the responsibility of Studio E to determine whether the use of such material would enable the building to comply with functional requirement B4(1) of the Building Regulations and advise the TMO accordingly. Its failure to recognise that ACM was dangerous and to warn the TMO against its use represented a failure to act in accordance with the standard of a reasonably competent architect. It also failed to recognise that Celotex insulation was combustible and not suitable for use on a building over 18 metres in height in accordance with the statutory guidance. Studio E therefore bears a very significant degree of responsibility for the disaster.
- 2.80** We have identified many other respects in which Studio E failed to meet the standards of a reasonably competent architect, of which the following are the most significant. It failed to ensure that Exova completed the fire safety strategy for the refurbished building or advise Rydon and the TMO that it should be required to do so. It failed to understand that it was responsible for design work carried out by

⁶ See generally Part 6 Chapter 63.

sub-contractors and so did not check Harley's designs to ensure that on completion the building would comply with the Building Regulations. It did not devise a proper cavity barrier strategy or check Harley's designs for the cavity barriers and it failed to produce detailed drawings of the window reveals or to notice that the materials specified for the window infill panels were unsuitable.

2.81 Exova also bears considerable responsibility for the fact that Grenfell Tower was in a dangerous condition on completion of the refurbishment.⁷ Our most serious criticism is that it failed to produce a final version of the fire safety strategy for the refurbished building and that it failed either to draw that fact to the attention of the design team or to warn it about the potential consequences. None of those responsible for drafting the fire safety strategy visited Grenfell Tower; the only site visit by a member of Exova's staff took place at a preliminary stage. Exova's attitude was wholly inconsistent with the careful approach to matters affecting the safety of life to be expected of a reasonably competent fire engineer.

⁷ See generally Part 6 Chapter 54.

- 2.82** We consider that the principal contractor, Rydon, also bears considerable responsibility for the fire.⁸ It gave inadequate thought to fire safety, to which it displayed a casual attitude throughout the project and its systems for managing the design work did not ensure that its sub-contractors and consultants properly understood their different responsibilities. Rydon itself did not understand where responsibility for individual decisions lay and as a result it failed to co-ordinate the design work properly.
- 2.83** Rydon had an inexperienced team on the refurbishment that did not have sufficient knowledge of the Building Regulations or Approved Document B. It relied entirely on its cladding sub-contractor, Harley, to draw its attention to any errors in the design, but it did not specifically ask Harley to assess Studio E's work. It failed to take proper steps to investigate Harley's competence and ensure that it was competent to undertake the work and capable of providing the services required of it. It was complacent about the need for fire engineering advice and took the decision not to retain Exova without consulting the TMO, Studio E or Artelia. Its understanding of the work already carried out

⁸ See generally Part 6 Chapter 64.

by Exova was superficial; as a result, it failed to realise that the fire safety strategy had not been completed.

2.84 Harley itself failed in many respects to meet the standards to be expected of a reasonably competent cladding contractor and it too bears a significant degree of responsibility for the fire.⁹ It did not concern itself sufficiently with fire safety at any stage of the refurbishment and appears to have thought that there was no need for it to do so, because others involved in the project, and ultimately building control, would ensure that the design was safe. It failed to ask the kind of questions about the materials being considered that a reasonably competent cladding contractor would have asked. It was induced to buy Reynobond 55 PE panels partly by its existing relationship with Arconic and the cladding fabricator, CEP Architectural Facades, with which it was able to negotiate a favourable price. Its staff were unaware of the requirements of the Building Regulations relating to fire safety, the guidance in Approved Document B or industry guidance and did not understand the underlying testing regime.

⁹ See generally Part 6 Chapter 65.

- 2.85** Although Celotex RS5000 (as opposed to Celotex FR5000) had not been specified, Harley accepted it for use on the tower without enquiring in any detail whether it could be safely used and did not ask any of the other members of the design team that question before doing so. Its design for the cavity barriers was incomplete and did not comply with the guidance in Approved Document B.
- 2.86** RBKC's building control department failed to perform its statutory function of ensuring that the design of the refurbishment complied with the Building Regulations.¹⁰ It therefore bears considerable responsibility for the dangerous condition of the building immediately on completion of the work. The surveyor responsible for the refurbishment was overworked, inadequately trained and had a very limited understanding of the risks associated with the use of ACM panels. He failed to obtain full information about the construction of the external wall at the stage of the full plans application and did not ask whether Exova had provided a completed fire safety strategy. He knew that ACM was to be used as the rainscreen but paid little or no attention to the BBA certificate for Reynobond 55 PE. He failed to recognise that Celotex RS5000 insulation was not a material of limited combustibility and, if he looked at

¹⁰ See generally Part 6 Chapter 62.

any information about it, he simply accepted the assertion that it was suitable for use on tall buildings. He failed to consider whether the external wall system proposed for Grenfell Tower was the same as that tested by Celotex and said to support the use of RS5000.

2.87 The TMO must also take a share of the blame for the disaster.¹¹ As the client it failed to take sufficient care in its choice of architect and paid insufficient attention to matters affecting fire safety, including the work of the fire engineer.

¹¹ See generally Part 6 Chapter 66.

Part 7

Replacement of the gas riser (Chapter 68)

- 2.88** This short chapter describes the work carried out in 2016 and 2017 to replace one of the six gas risers in Grenfell Tower that was suffering from corrosion. There were defects in the design and execution of the work, to which we draw attention. The work had not been completed by the time of the fire, but neither the defects we have identified nor the failure to have completed the work contributed to the fire.
- 2.89** On the night of the fire it was not possible to find the two pipeline isolation valves designed to enable the supply of gas to the tower to be shut off quickly, almost certainly because they had been covered over in the course of landscaping work. However, that did not affect the course of events surrounding the fire because burning debris falling on the east side of the tower would have prevented access to them.

Part 8

The London Fire Brigade (Chapters 69 – 83)

- 2.90** The Lakanal House fire in July 2009 should have alerted the LFB to the shortcomings in its ability to fight fires in high-rise buildings that revealed themselves once more at Grenfell Tower on the night of 14 June 2017. Those shortcomings could have been made good if the LFB had been more effectively managed and led. In particular, it should have responded more effectively to its experience at Lakanal House and made better use of the knowledge it had gained of the dangers posed by modern materials and methods of construction. Importantly, it failed to ensure that in the years immediately preceding the Grenfell Tower fire regular training of a suitable kind was provided to its control room operators on handling many fire survival guidance calls concurrently and on their duties more generally. Senior managers at the LFB failed to take steps to ensure that its arrangements for handling fire survival calls reflected national guidance.
- 2.91** Those failures were attributable to a chronic lack of effective management and leadership, combined with an undue emphasis on process. Senior officers were complacent about the

operational efficiency of the brigade and lacked the management skills to recognise the problems or the will to correct them. Those managerial weaknesses were partly the result of an historic failure to integrate the operational departments and the departments responsible for support functions, in particular the control room. There was a tendency to treat problems of which managers became aware as undeserving of change or too difficult to resolve, even when they concerned operational or public safety.

- 2.92** Those failures were compounded by an entrenched but unfounded assumption that the Building Regulations were sufficient to ensure that external wall fires of the kind that were known to have occurred in other countries would not occur in this country. After the Lakanal House fire senior officers recognised that compliance with the regulations could not be guaranteed, but no one appears to have thought that firefighters needed to be trained to recognise and deal with the consequences.
- 2.93** The main failings on the part of the LFB that led to the shortcomings identified in the Phase 1 report included a failure to identify training needs combined with a system for commissioning new training packages that was cumbersome and slow. Incident command training was poorly

devised and was not effectively delivered; inadequate provision was made for refresher training and regular assessment.

- 2.94** The LFB failed to ensure that the knowledge of the dangers presented by the increasing use of combustible materials, in particular the risk of external fire spread and the resulting loss of compartmentation, held by some specialist officers was shared with the wider organisation and reflected in training, operational policies and procedures. Firefighters were not given proper training or guidance on how to carry out inspections of complex buildings and there were no effective arrangements for sharing information about risks posed by particular buildings. Internal recommendations for improving the inspection of high-rise residential buildings were not implemented.
- 2.95** The policy on high-rise firefighting did not reflect national guidance and senior management failed to recognise that producing contingency plans for a full evacuation and training firefighters to implement them was an essential aspect of fighting fires in high-rise buildings.
- 2.96** One significant shortcoming was a failure to recognise the possibility that in the event of a fire in a high-rise residential building a large number of calls seeking help, both from within

and outside the building, might be generated. The LFB failed to take any steps to enable it to respond effectively to that kind of demand. As a result, when faced with a large number of calls about people needing to be rescued from Grenfell Tower, both those in the control room and those responsible for handling that information at the fireground were forced to resort to various improvised methods of varying reliability to handle the large amount of information they received.

2.97 The senior officers responsible for the control room understood the need to give priority to training staff in handling fire survival guidance calls, but in the years between 2010 and 2017 no structured or regular refresher training in handling fire survival guidance calls was designed or delivered to control room staff. Such training as was provided did not reflect national guidance in some respects; nor did it respond to the experience of those control room officers who had been on duty at the time of the Lakanal House fire. The failures in the effective functioning of the control room were due in a large measure to weak management over the preceding years combined with sporadic and ineffectual oversight by senior officers.

2.98 The communication equipment in use at the time of the Grenfell Tower fire proved to function inadequately in a high-rise building constructed

largely of reinforced concrete. That was a well known problem but nothing had been done to alleviate it and firefighters were not trained to recognise and respond to it. The LFB's approach was to do its best with what it had available. As a result, it failed to make sufficient efforts to modernise its equipment, thereby significantly impairing its operational efficiency. The LFB's policies did not contemplate a widespread loss of communications or provide guidance on how it could effectively be restored.

Part 9

The deceased (Chapters 84 – 97)

- 2.99** The detailed description of the events of 14 June 2017 contained in the Phase 1 report places us in a good position to make comprehensive findings about the circumstances in which the deceased met their deaths. Although it is for the coroner to decide whether she should adopt our findings as sufficient to enable her to discharge her responsibilities, we hope that she will be able to do so and thus spare the bereaved the distress of a further investigation.
- 2.100** We begin this Part with a general introduction followed by a description of the painstaking methods adopted to recover and identify the remains of the individual deceased. In that context we refer to the work of the teams of forensic archaeologists, forensic anthropologists and forensic pathologists, as well as other experts and police disaster victim identification officers and licensed search officers. We also describe in general terms the evidence given by Professor David Purser CBE BSc PhD DipRCPATH, an expert on toxicology.
- 2.101** We devote a separate chapter of this Part to each floor on which people died. After a general description of the circumstances affecting that

floor, our findings deal in turn with each of those who died on, or fell from, that floor. In the case of those who died on the stairs we have described the circumstances relating to the floor on which their flat was located. In each case we give a brief description of the deceased before describing the immediate circumstances in which he or she died.

2.102 Although the evidence was sometimes rather confused, we have been able to make findings about emergency calls made by those who were trapped, the transmission of information from the LFB control room to the incident ground and thence to the bridgehead and the deployment of firefighters in response. To the extent possible we have made what we consider to be reliable findings about the time of death in each case, although in many cases there is inevitably a large measure of uncertainty. In the light of the expert evidence we are able to make findings about the cause of death, including findings that all those whose bodies were destroyed by the fire were dead or unconscious when the fire reached them.

Part 10

Response and recovery (Chapters 98 – 107)

- 2.103** In the first week after the fire at Grenfell Tower the response of the government and RBKC was muddled, slow, indecisive and piecemeal. RBKC's systems and leadership were wholly inadequate to the task of handling an incident of such magnitude and gravity, involving, as it did, mass homelessness and mass fatalities. The resilience machinery in London and within central government was not flexible enough and took too long to move into action.
- 2.104** Certain aspects of the response demonstrated a marked lack of respect for human decency and dignity and left many of those immediately affected feeling abandoned by authority and utterly helpless. RBKC should have done more to cater for those from diverse backgrounds, in particular those many residents of the Muslim faith who were observing Ramadan at the time. They were left feeling that the council had no regard for their cultural and religious needs. For many, their only source of support was local voluntary organisations, which moved in to help and provide for basic needs where those in authority had failed. Many who had particular religious, cultural

or social needs suffered a significant degree of discrimination in ways that could and would have been prevented if the guidance had been properly followed.

- 2.105** The response to the disaster was inadequate principally because RBKC did not have an effective plan to deal with the displacement of a large number of people from their homes and such plan as it did have did not make effective use of the TMO. It had made no contingency arrangements for obtaining a large amount of emergency accommodation at short notice and had no arrangements for identifying those who had been forced to leave their homes or for communicating with them. Arrangements for obtaining and disseminating reliable information were also lacking.
- 2.106** One reason for the lack of effective plans was that RBKC had failed to train its staff adequately. They did not have a sufficient understanding of the importance of resilience or sufficient commitment to it. Exercises had not been held regularly and staff had not been required to attend the training sessions run by the London Resilience Group. Deficiencies that were well known to senior management had not been corrected.

- 2.107** Over a number of years, RBKC had allowed the capacity of its staff to respond to major emergencies to decline. There had been clear warnings to senior management that it did not have enough trained staff to enable it to carry out its responsibilities as a Category 1 responder and that contingency plans had not been practised enough. As a consequence, RBKC lacked the people it needed to respond to the fire effectively, both for the purposes of staffing the borough emergency communication centre and to deal with those who needed help. It was therefore ill-equipped to deal with a serious emergency. None of that was due to any lack of financial resources.
- 2.108** RBKC's chief executive, Nicholas Holgate, was not capable of taking effective control of the situation and mobilising support of the right kind without delay. He had no clear plan and did not receive all the information he needed. He was not well suited to dealing with the crisis that was unfolding in front of him and lacked a strong group of officers to whom he could delegate responsibility for some aspects of the response. He was reluctant to take advice from those with greater experience and was unduly concerned for RBKC's reputation.

- 2.109** RBKC had failed to integrate the TMO into its emergency planning. It should have realised that the TMO's knowledge of its buildings and their occupants could play an important part in the response to any disaster affecting any part of its housing stock.
- 2.110** The arrangements designed to promote the resilience of London as a whole did not provide for an experienced leader to take over the direction of the response to a disaster that had occurred within the confines of a single borough except by agreement with the chief executive of that borough. In the event, Nicholas Holgate was persuaded under pressure from a senior government official to hand over control to John Barradell, but not until two days after the fire.
- 2.111** The training of resilience personnel in London was piecemeal and not co-ordinated; it was also voluntary and not subject to any external assessment or validation. That contributed to a situation in which the capacity of individual local authorities to respond to emergencies varied between boroughs.
- 2.112** The government began monitoring the response to the fire at an early stage, but its ability to take effective steps to provide practical assistance was undermined by a shortage of reliable information and by the restricted nature of its

powers to intervene. The Civil Contingencies Act 2004 did not give it the power to take control of the response without invoking the powers under sections 5 or 7. Those powers are far-reaching but cumbersome in operation and not well suited to taking control of the response when a local authority is failing.

- 2.113** The TMO attracted criticism from many quarters, but in relation to its response to the fire much of it was unfair. Although its staff should have received more training in how to respond to an emergency, they threw themselves into the response and helped to provide support, insofar as they were equipped to do so. Some of those within government who criticised the TMO did not properly understand its position or the scope of its powers, and it was unfairly tainted by association with RBKC. Many of the difficulties encountered in returning residents to flats in the Walkways were not of its making. The TMO teams that went to some of the rest centres on 14 June 2017 to give what help they could are to be commended for their willingness to become directly involved and for the efforts they made at what was a very difficult time.
- 2.114** Those who emerge from the events with the greatest credit, and whose contribution only emphasised the inadequacies of the official response, are the members of the local

community. With the support of local voluntary organisations, they provided support in the hours immediately following the fire when the authorities were conspicuous by their absence. Indeed, one of RBKC's failings was to make too little use of the local voluntary organisations and to fail to have adequate standing arrangements to enable them to be called on in the event of a major emergency.

Part 11

Matters outstanding from Phase 1 (Chapters 108 – 110)

- 2.115** Two matters remained outstanding from Phase 1. The first concerned the respective contributions to the fire made by the ACM rainscreen panels and the polyisocyanurate and phenolic insulation boards. The second concerned the mechanism by which the fire had escaped from the kitchen of Flat 16 into the external wall of the building.
- 2.116** In a series of experiments designed by Professor Bisby and Professor Torero and carried out at Edinburgh University by Professor Bisby and his colleagues the ACM panels were shown to have been by far the largest potential contributor to energy release in the external wall system at Grenfell Tower. Celotex RS5000 (a polyisocyanurate foam) and Kingspan K15 (a phenolic foam) both had a much lower heat release rate per unit area.
- 2.117** The experiments showed that the presence of a cavity is not by itself sufficient to cause a fire in the rainscreen panels to develop to full involvement. Insulation also needs to be present, either to retain energy in the system or to burn and contribute additional energy. Even non-combustible insulation in the form of

mineral wool resulted in the growth of the fire to full involvement of the ACM panel. The method of fixing the panels has a significant effect on the way in which they perform in a fire. Panels in cassette form behave far worse than panels in riveted form.

- 2.118** The experimental work confirms that the principal factor which led to the rapid growth of the fire was the presence of unmodified polyethylene in the cores of the ACM panels rather than the insulation, although the presence of the insulation and its ability to retain heat was a decisive factor in promoting the growth of the fire.
- 2.119** The second matter outstanding concerned the mechanism by which the fire had escaped from the kitchen of Flat 16 into the external wall of the building. A reconstruction carried out by BRE in May 2019 had led it to conclude that the mechanism was different from that identified by Professor Bisby and Professor Torero. The chairman therefore indicated that the findings expressed in the Phase 1 report would remain provisional until they had had a better opportunity to study the report of the reconstruction. Having done so, Professor Bisby and Professor Torero both concluded that the reconstruction had not been truly representative

of the fire that occurred on 14 June 2017 and adhered to their original opinions. We therefore confirm the findings made in the Phase 1 report.

Part 12

The fire testing regime (Chapter 111)

- 2.120** In the years leading up to the Grenfell Tower fire test methods available for determining the reaction to fire of materials, products and even external wall systems did not provide designers with the information needed to assess the risk of fire spreading across the external wall of a building. Moreover, the statutory guidance on complying with functional requirement B4(1) of the Building Regulations was fundamentally defective.
- 2.121** The use of Class 0 as a standard of fire performance for products to be used on the external wall of tall buildings was wholly inappropriate. Neither of the main British Standard tests relevant to that classification reflected the development of a fire on the outside of a building or provided the information needed to assess how an external wall incorporating the product would perform in a fire. The European classifications based on the single burning item test were of similarly limited assistance in assessing the fire performance of external wall systems.
- 2.122** The performance criteria for large-scale system tests in BR 135 were inadequate, in particular because they could not be clearly

linked to the functional requirements in the Building Regulations or the guidance in Approved Document B. They were also directed too much to the spread of flame through cavities and contained no criteria for mechanical performance. The BS 8414 test itself provided limited information relevant to assessing the rate at which fire was likely to spread over an external wall. Critically, an external wall system that met the criteria in BR 135 could still allow fire to spread through it and beyond the compartment of origin at a rate that was incompatible with a stay put strategy. Accordingly, although failure to meet the performance criteria in BR 135 would demonstrate that a system was unlikely to comply with functional requirement B4(1) of the Building Regulations, the converse was not necessarily true. A system might meet the performance criteria of BR 135 and yet fail to comply with the functional requirement.

2.123 There was a widespread but erroneous assumption that, if an external wall system tested in accordance with BS 8414 met the performance criteria in BR 135, the building would comply with functional requirement B4(1) without any need to analyse the information obtained from the test or the conditions likely to be encountered in use. Approved Document B helped to perpetuate that assumption, not least by failing to make

it clear that the results of the test always had to be analysed in conjunction with all other available information in order to understand the way in which the wall was likely to behave when exposed to the flames and heat of a fully developed compartment fire. The method adopted in BR 135 for assessing compliance was too simplistic. It provided a simple pass or fail result, when the results of the test required a degree of interpretation beyond the competence of most in the industry.

Part 13

The response of other countries (Chapter 112)

- 2.124** We have referred in the course of our report to fires that have occurred in other tall buildings around the world, principally as a result of the use of ACM rainscreen products. With the help of Professor Torero, who has extensive knowledge of the regulatory regimes in many other jurisdictions, we have examined the response of other countries to the danger posed by combustible cladding in order to see what we can learn from their experience.
- 2.125** In this chapter we describe the approaches to the problem that have been adopted in countries from the United States through Europe and the Middle East to Australia. Some countries have adopted a prescriptive approach to regulating construction, which is fundamentally different from a regime based on functional requirements of the kind that applies in this country and is therefore less useful as a model. Others, however, in particular Australia, have adopted functional requirements similar to our own and provide an example from which we can learn.

Part 14

Recommendations (Chapter 113)

- 2.126** We are invited by our Terms of Reference to make recommendations that we have reason to think will help prevent another disaster of the kind that overwhelmed Grenfell Tower and improve the ability of the authorities to respond to emergencies when they occur, as inevitably they will.
- 2.127** We do not think it would be appropriate or helpful to attempt to summarise those recommendations here because to do so would inevitably fail to do them justice. We should make it clear, however, that they are all firmly grounded in the evidence we have received and the findings we have made.

Chapter 113

Recommendations

113.1 We are invited by our Terms of Reference to recommend measures to be taken in response to any deficiencies we found to exist in the matters under investigation. We have grouped our recommendations by reference to the subject matter to which they relate.

The construction industry

113.2 As appears from the findings in our report, we are satisfied that the system of regulating the construction and refurbishment of high-rise residential buildings that existed at the time of the Grenfell Tower fire was seriously defective in a number of respects. The statutory guidance in Approved Document B was poorly worded and liable to mislead designers into thinking that complying with its terms would inevitably ensure that the building would comply with the legal requirements of the Building Regulations. The government department responsible for the Building Regulations failed actively to monitor the performance of the system and failed to ensure that dangers of which it became aware were

communicated to industry. It was not sensitive to the need to make urgent changes to the statutory guidance if conditions required it.

113.3 The remarks that follow are directed to the system for ensuring safety from fire, but we have no reason to think that other aspects of building safety are not subject to similar considerations. Safety of people in the built environment depends principally on a combination of three primary elements, good design, the choice of suitable materials and sound methods of construction, each of which depends in turn in a large measure on a fourth, the skill, knowledge and experience of those engaged in the construction industry. Unfortunately, as our investigations have shown, at the time of the Grenfell Tower fire there were serious deficiencies in all four of those areas.

The regulatory arrangements

113.4 We think that over the course of time the arrangements under which the construction industry was regulated had become too complex and fragmented. At the time of the fire the Department for Communities and Local Government (now the Ministry of Housing, Communities and Local Government) was responsible for the Building Regulations and the statutory guidance, the Department for Business, Energy and Industrial Strategy (now

the Department for Business and Trade) was responsible for regulating products and the Home Office was responsible for the fire and rescue services. Building control was partly in the hands of local authorities and partly in the hands of approved inspectors operating as commercial organisations, enforcement of the law relating to the sale of construction products was carried out by Trading Standards and commercial organisations provided testing and certification services to manufacturers of products. UKAS accredited organisations operating as conformity assessment bodies. In our view, this degree of fragmentation was a recipe for inefficiency and an obstacle to effective regulation.

Regulation

113.5 In our view all the functions to which we have referred, as well as some others to which we refer below, should be exercised by a single independent body headed by a person whom, for the sake of convenience, we shall call a construction regulator, reporting to a single Secretary of State. The establishment of such a regulator would bring a number of benefits, not least a focal point in driving a much-needed change in the culture of the construction industry. It would enable information to be shared effectively between those responsible for different

aspects of the industry and promote the exchange of ideas. Information on developments in the industry, both in this country and abroad, could be shared more easily between all those interested in it. We envisage that such a construction regulator would have sufficient resources to take on the following functions, most of which are currently discharged by one or other of a variety of bodies:

- a. the regulation of construction products;
- b. the development of suitable methods for testing the reaction to fire of materials and products intended for use in construction;
- c. the testing and certification of such products;
- d. the issue of certificates of compliance of construction products with the requirements of legislation, statutory guidance and industry standards;
- e. the regulation and oversight of building control;
- f. the licensing of contractors to work on higher-risk buildings;
- g. monitoring the operation of the Building Regulations and the statutory guidance and advising the Secretary of State on the need for change;
- h. carrying out research on matters affecting fire safety in the built environment;

- i. collecting information, both in this country and abroad, on matters affecting fire safety;
- j. exchanging information with the fire and rescue services on matters affecting fire safety;
- k. accrediting fire risk assessors;
- l. maintaining a publicly available library of test data and publications.

113.6 We are aware that in the period since the Grenfell Tower fire Parliament has passed the Building Safety Act 2022 to regulate work on higher-risk buildings, to impose particular duties on those involved in the construction and refurbishment of such buildings and to establish a Building Safety Regulator responsible for building control and for overseeing standards of competence. However, responsibility for the range of functions identified above remains dispersed. **We therefore recommend** that the government draw together under a single regulator all the functions relating to the construction industry to which we have referred.

113.7 For the purpose of this and our other recommendations we have used the expression “higher-risk building” in the sense in which it is used in the Building Safety Act, that is, a building that is at least 18 metres in height (or has at least seven storeys) and contains at least two

residential units.¹² However, we do not think that to define a building as “higher-risk” by reference only to its height is satisfactory, being essentially arbitrary in nature. More relevant is the nature of its use and, in particular, the likely presence of vulnerable people, for whom evacuation in the event of a fire or other emergency would be likely to present difficulty. **We therefore recommend** that the definition of a higher-risk building for the purposes of the Building Safety Act be reviewed urgently.

Government

113.8 The fragmentation of responsibility for regulating the construction industry is currently mirrored in the range of government departments responsible for matters affecting fire safety. If a single body were responsible for all aspects of regulating matters affecting fire safety in the construction industry, that body should report to a single Secretary of State answerable to Parliament for all aspects of fire safety. That should improve the quality of government by providing an administrative environment in which information can be shared more quickly and more effectively between teams responsible for different aspects of the work and facilitate communication between the regulator and the department. It should

¹² Building Safety Act 2022, sections 31 and 65.

also ensure that greater emphasis is placed on ensuring the safety of the built environment and that policy is developed in an holistic and coherent way. **We therefore recommend** that the government bring responsibility for the functions relating to fire safety currently exercised by MHCLG, the Home Office and the Department for Business and Trade into one department under a single Secretary of State.

Chief Construction Adviser

- 113.9** The minister will need to be able to turn for advice to someone who has a good working knowledge and practical experience of the construction industry. **We therefore recommend** that the Secretary of State appoint a Chief Construction Adviser with a sufficient budget and staff to provide advice on all matters affecting the construction industry, including:
- a. monitoring all aspects of the department's work relating to the Building Regulations and statutory guidance;
 - b. providing advice to the Secretary of State on request; and
 - c. bringing to the attention of the Secretary of State any matters affecting the Building Regulations and statutory guidance or matters affecting the construction industry

more generally of which the government should be aware.

Legislation and guidance

- 113.10** Nothing we have discovered in the course of our investigations has led us to think that expressing the legal requirements of the Building Regulations in terms of functional requirements is in itself unsatisfactory, but we do think that the way in which the statutory guidance in Approved Document B was expressed was unsatisfactory in a number of respects. We have drawn attention in Chapter 6 to the retention of Class 0 as a standard governing the fire performance of external wall panels and in Chapter 48 to the consequences of expressing in an apparently prescriptive form what is in reality no more than guidance. Most importantly we do not think that Approved Document B provides the information needed to design buildings that are safe in fire.
- 113.11** Approved Document B needs to be reviewed as a matter of urgency, taking into account the expert evidence of Professor Bisby, Professor Torero and Dr Lane, all of which is publicly available and none of which was significantly challenged in the course of our proceedings. It must then be kept under continuous review, together with the other Approved Documents, and amended annually or

promptly whenever developments in materials or building methods make that desirable. It should be drafted conservatively to ensure, as far as possible, that compliance with it will provide a high degree of confidence that on completion of the work the building will comply with the Building Regulations. **We therefore recommend** that the statutory guidance generally, and Approved Document B in particular, be reviewed accordingly and a revised version published as soon as possible.

113.12 Our investigations have shown that levels of competence in the construction industry are generally low and that by the time of the Grenfell Tower fire many contractors, designers and building control officers treated the statutory guidance as containing a definitive statement of the legal requirements. It is understandable that those who turn to the guidance for advice about how to comply with the Building Regulations should be tempted to treat it as if it were definitive, but that is a danger that the Secretary of State needs to recognise and guard against. **We therefore recommend** that a revised version of the guidance contain a clear warning in each section that the legal requirements are contained in the Building Regulations and that compliance with the guidance will not necessarily result in compliance with them.

113.13 We do not think it appropriate for us to recommend specific changes to Approved Document B, save in one respect. As we have pointed out in Chapter 48, the guidance proceeds on the assumption that effective compartmentation renders a stay put strategy an appropriate response to a fire in a flat in a high-rise residential building. New materials and methods of construction and the practice of overcladding existing buildings make the existence of effective compartmentation a questionable assumption and **we recommend** that it be reconsidered when Approved Document B is revised. One thing that has emerged clearly from our investigations is that in order to ensure the safety of occupants, including any with physical or mental impairments, those who design high-rise buildings need to be aware of the relationship between the rate at which fire is likely to spread through the external walls and the time required to evacuate the building or the relevant parts of it. A stay put strategy in response to a compartment fire will be acceptable only if there is negligible risk of fire escaping into and spreading through the external wall. Calculating the likely rate of fire spread and the time required for evacuation, including the evacuation of those with physical or mental impairments, are matters for a qualified fire engineer. We do not think that it would be helpful

to attempt to include in Approved Document B an indication of what would be acceptable because each building is different, but **we recommend** that the guidance draw attention to the need to make a calculation of that kind. It is one that ought to form an essential part of any fire safety strategy.

- 113.14** We think that a fresh approach needs to be taken to reviewing and revising the Building Regulations and statutory guidance that is driven primarily by considerations of safety. Fresh minds are needed. **We therefore recommend** that, as far as possible, membership of bodies advising on changes to the statutory guidance should include representatives of the academic community as well as those with practical experience of the industry (including fire engineers) chosen for their experience and skill and should extend beyond those who have served on similar bodies in the past.

Fire safety strategy

- 113.15** A fire safety strategy for a building should describe its structure and the various fire protection systems it contains and set out how they work together to ensure the safety of the occupants in the event of a fire. Those involved in the design and execution of the Grenfell Tower refurbishment failed to understand properly the need for a fire safety strategy and therefore

failed to ensure that a final version of the Outline Fire Safety Strategy begun by Exova was completed. That allowed the building to be in a dangerous condition on completion. In order to avoid a repeat of that error, we consider that there is a compelling case for requiring a fire safety strategy to be produced as a condition of obtaining building control approval for the construction or refurbishment of any higher-risk building and for it to be reviewed and approved on completion. **We therefore recommend** that it be made a statutory requirement that a fire safety strategy produced by a registered fire engineer (see below) to be submitted with building control applications (at Gateway 2) for the construction or refurbishment of any higher-risk building and for it to be reviewed and re-submitted at the stage of completion (Gateway 3). Such a strategy must take into account the needs of vulnerable people, including the additional time they may require to leave the building or reach a place of safety within it and any additional facilities necessary to ensure their safety.

Fire Performance Tests

113.16 Assessing the fire performance of an external wall requires reliable information about the products and materials proposed for use in its construction, which in turn requires the availability of suitable

methods for testing reaction to fire. As we have explained in Chapter 111, the small-scale test methods that have traditionally been relied on do not provide the information needed for that purpose and the large-scale test method (BS 8414) and classification in accordance with BR 135 lacks relevant performance criteria and provides a limited amount of useful information.

- 113.17** As is apparent from the experiments conducted by Professor Bisby and Professor Torero for Phase 2 of our investigations, the factors that affect the way in which fire spreads over ventilated rainscreen external wall systems are complex and understanding them is an evolving science. Intuitive judgements are often wrong because a small change in the system can have a significant effect on the outcome. It follows that assessing whether an external wall system can support a particular evacuation strategy is difficult because the necessary information is not always available. **We therefore recommend** that steps be taken in conjunction with the professional and academic community to develop new test methods that will provide the information needed for such assessments to be carried out reliably.
- 113.18** In the light of Professor Torero's evidence we think that BS 9414 will encourage people who are not trained fire engineers to think that they can safely assess the performance of a

proposed external wall system by extrapolation from information obtained from tests on one or more different systems. For the reasons given by Professor Torero we think that BS 9414 should be approached with caution and **we recommend** that the government make it clear that it should not be used as a substitute for an assessment by a suitably qualified fire engineer.

Certification of products and publication of test data

- 113.19** It is essential that those responsible for designing buildings have access to reliable information about the materials and products they wish to use. In their product literature manufacturers make many claims for their products, some of which are not of an overtly technical nature but are calculated to give the impression that a particular product has passed a particular test or has been shown to be suitable for a particular use. That was one of the marketing devices employed by those who manufactured and sold the rainscreen cladding panels and the insulation used in the refurbishment of Grenfell Tower.
- 113.20** Manufacturers were able to use misleading marketing material in part because the certification bodies that provided assurance to the market of the quality and characteristics of the products failed to ensure that the statements

in the certificates they issued were accurate and based on appropriate and relevant test evidence. The United Kingdom Assessment Service (UKAS), the organisation charged with accrediting them, failed to apply proper standards of monitoring and supervision. The fact that three separate manufacturers were able to obtain misleading certificates relating to their products is evidence of a serious failure of the system and points to a need for a different approach to the certification of construction products.

- 113.21** We do not think that the appointment of a National Regulator of Construction Products will solve the problem because the system will still depend on the effectiveness of the conformity assessment bodies and the limited oversight of UKAS. Conformity assessment bodies provide a commercial service combined with an element of regulation, but the two functions do not sit easily together. Pressure to acquire and retain customers can all too easily lead such bodies to be less rigorous in their examination of products and materials and enforcing their terms of contracts than could reasonably be expected of bodies acting in the public interest.
- 113.22** **We therefore recommend** that the construction regulator should be responsible for assessing the conformity of construction products with the requirements of legislation, statutory guidance

and industry standards and issuing certificates as appropriate. We should expect such certificates to become pre-eminent in the market.

113.23 In our view clarity is required to avoid those who rely on certificates of conformity being misled.

We therefore recommend

- a. that copies of all test results supporting any certificate issued by the construction regulator be included in the certificate;
- b. that manufacturers be required to provide the construction regulator with the full testing history of the product or material to which the certificate relates and inform the regulator of any material circumstances that may affect its performance; and
- c. manufacturers be required by law to provide on request copies of all test results that support claims about fire performance made for their products.

Fire engineers

113.24 Designing buildings that are safe in the event of a fire requires particular skill. It is a skill that can be acquired only by specialised education and experience worthy of formal recognition. Unfortunately, the term “fire engineer” does not at present denote any formal qualification and as a result it is possible for a person to practise as

a fire engineer without any formal qualification. The evidence we have heard suggests that not all those who profess to be fire engineers are capable of performing that role competently and that the complexity of the subject matter is not well understood.

113.25 In those circumstances, and particularly given the importance of fire engineers in ensuring the safety of life, we think that the profession of fire engineer should be formally recognised and that both the title and the function should be protected by statute. Over time that would create a body of registered fire engineers who are capable of contributing to the design and delivery of safe buildings and of educating those construction professionals with whom they work in effective fire safety strategies. **We therefore recommend** that the profession of fire engineer be recognised and protected by law and that an independent body be established to regulate the profession, define the standards required for membership, maintain a register of members and regulate their conduct. In order to speed up the creation of a body of professional fire engineers **we also recommend** that the government take urgent steps to increase the number of places on high-quality masters level courses in fire engineering accredited by the professional regulator.

113.26 Other construction professionals and more senior members of the fire and rescue services need to have a basic understanding of the principles of fire engineering as they apply to the built environment. The circumstances surrounding the Grenfell Tower fire show that an effective contribution from a fire engineer could have prevented the disaster by alerting the client and the principal contractor to the dangers of using aluminium composite panels with unmodified polyethylene cores and combustible insulation in the external wall of the building. They also show that the failure of Rydon and the TMO to understand the nature and importance of the analysis and advice that Exova should have provided contributed to their failure to obtain it. An authoritative statement of the skills that a fire engineer can be expected to bring to bear might assist the regulatory body and would improve the competence of other construction professionals and the fire and rescue services by enabling them to understand better the contribution that fire engineers can make to the construction of a safe building. It would also promote effective communication between them. Such a statement would need to draw on and reflect the experience of both practising fire engineers and those in the academic world to ensure that it was objective and properly reflected the scientific and intellectual demands of the role.

113.27 The development and maintenance of a statement of professional skills should ultimately be the responsibility of the body that regulates the profession, but pending the establishment of such a body **we recommend** that the government convene a group of practitioner and academic fire engineers and such other professionals as it thinks fit to produce an authoritative statement of the knowledge and skills to be expected of a competent fire engineer. Such a statement would also enable others in the construction industry to understand better the nature and importance of a fire engineer's work. We think it would be of benefit to those carrying out this work to have regard to the reports of the Warren Centre, to which we refer in Chapter 112.

113.28 **We also recommend** that the government, working in collaboration with industry and professional bodies, encourage the development of courses in the principles of fire engineering for construction professionals and members of the fire and rescue services as part of their continuing professional development.

Architects

113.29 Traditionally, the role of the architect has been fundamental to any construction project of significant size. Regrettably, the work of Studio E on the Grenfell Tower refurbishment

fell significantly below the standard reasonably to be expected of it in a number of significant ways, in particular, in failing to exercise proper care in relation to the choice of insulation and rainscreen panels. The evidence, not least the fact that similar materials have since been found on hundreds of other high-rise buildings, suggests that there may be a widespread failure among the profession to investigate properly or understand the nature of the materials being chosen for that purpose.

113.30 We recognise that both the Architects Registration Board and the Royal Institute of British Architects have taken steps since the Grenfell Tower fire to improve the education and training of architects. **We recommend** that they should review the changes already made to ensure they are sufficient in the light of our findings.

113.31 **We also recommend** that it be made a statutory requirement that an application for building control approval in relation to the construction or refurbishment of a higher-risk building (Gateway 2) be supported by a statement from a senior manager of the principal designer under the Building Safety Act 2022 that all reasonable steps have been taken to ensure that on completion the building as designed will be as safe as is required by the Building Regulations.

Contractors

- 113.32** The design and build form of contract, which is now very widely used, makes the principal contractor responsible for the whole range of activities relating to the work, even though it invariably engages sub-contractors to carry out different aspects of it. We have criticised Rydon for various failings in its organisation of the Grenfell Tower refurbishment. They include a failure to make it clear which contractor was responsible for particular aspects of the design and a failure to take an active interest in fire safety. We are not the first to conclude that the construction industry as a whole needs to become technically more competent and less willing to sacrifice quality to speed and cost.
- 113.33** We think that one way in which to eliminate shortcomings of the kind we have identified and to improve the efficiency of contractors would be to introduce a licensing system for those wishing to undertake work on higher-risk buildings. That would ensure that those working on the most sensitive buildings are qualified by experience and organisation to do so and such a system should lead to a general increase in competence among contractors. We also think that, in order to ensure that fire safety is given the importance it deserves, a senior member of the contractor's organisation should be personally

responsible for taking all reasonable steps to ensure that on completion of the work the building is as safe as it should be. **We therefore recommend** that a licensing scheme operated by the construction regulator be introduced for principal contractors wishing to undertake the construction or refurbishment of higher-risk buildings and that it be a legal requirement that any application for building control approval for the construction or refurbishment of a higher-risk building (Gateway 2) be supported by a personal undertaking from a director or senior manager of the principal contractor to take all reasonable care to ensure that on completion and handover the building is as safe as is required by the Building Regulations.

Clients

113.34 The events surrounding the refurbishment of Grenfell Tower suggest that at that time those who commissioned building work may not have been fully aware of their responsibility for compliance with the provisions of the Building Regulations, particularly if an application for building control approval was made by a consultant on their behalf. We therefore welcome the introduction by regulations made under the Building Safety Act 2022 of a requirement for a Building Regulations compliance statement, made

or approved by the client, to be provided at the time of an application for building control approval (Gateway 2). In the light of that requirement we do not think that any further action in relation to clients is currently required.

Building control

- 113.35** The evidence shows that in the period leading up to the Grenfell Tower fire many of those involved in major construction projects, including clients, contractors and even architects, regarded building control primarily as a source of advice and assistance. It was even described as an extension of the design team. In many cases that was how building control itself saw its role. That was a serious misunderstanding, but it was fostered by building control bodies themselves, who preferred to co-operate with applicants to enable proposals to be approved rather than enforce the Building Regulations rigorously. In our view, that has to change.
- 113.36** The government has taken steps to improve the regulation of building control and the competence of those who consider applications for approval. We expect the construction regulator to continue these new arrangements, which are intended to introduce a wholly new climate in which both

applicants for approval and building control officers understand that the function of building control is regulatory in nature.

113.37 One of the causes of the inappropriate relationship to which we have referred was the introduction into the system of commercial interests. Approved inspectors had a commercial interest in acquiring and retaining customers that conflicted with the performance of their role as guardians of the public interest. Competition for work between approved inspectors and local authority building control departments introduced a similar conflict of interest affecting them. As things stand that underlying conflict of interest will continue to exist and will continue to threaten the integrity of the system. **We therefore recommend** that the government appoint an independent panel to consider whether it is in the public interest for building control functions to be performed by those who have a commercial interest in the process.

113.38 The shortcomings we have identified in local authority building control suggest that in the interests of professionalism and consistency of service all building control functions, including those currently performed by local authorities, should be exercised nationally. Accordingly,

we recommend that the same panel consider whether all building control functions should be performed by a national authority.

A construction library

113.39 Those who design buildings, particularly higher-risk and complex buildings, would benefit from having access to a body of information, such as data from tests on products and materials, reports on serious fires and academic papers. In Chapter 112 we have referred to the Cladding Materials Library set up by the University of Queensland, which could form the basis of a valuable source of information for designers of buildings in general. **We recommend** that the construction regulator sponsor the development of a similar library, perhaps as part of a joint project with the University of Queensland, to provide a continuing resource for designers.

Response to recommendations

113.40 Our investigations have revealed that some important recommendations affecting fire safety were ignored by the government in the years leading up to the Grenfell Tower fire. Recommendations made by the Select Committee in 1999 were not implemented and the department's response to the recommendations made by the Lakanal House coroner was

inadequate. The department had no system for recording recommendations made by public bodies or keeping track of its response to them. That was obviously unsatisfactory.

We recommend that it be made a legal requirement for the government to maintain a publicly accessible record of recommendations made by select committees, coroners and public inquiries together with a description of the steps taken in response. If the government decides not to accept a recommendation, it should record its reasons for doing so. Scrutiny of its actions should be a matter for Parliament, to which it should be required to report annually.

Fire risk assessors

113.41 As we have pointed out in Chapter 12, concern has been expressed for many years about the competence of some of those offering their services as commercial fire risk assessors and the absence of any scheme of regulation to ensure that responsible persons under the Fire Safety Order can have confidence in the skill and experience of those whom they instruct to carry out fire risk assessments on their behalf. **We therefore recommend** that the government establish a system of mandatory accreditation to certify the competence of fire risk assessors by setting standards for qualification and continuing

professional development and such other measures as may be considered necessary or desirable. We think it necessary for an accreditation system to be mandatory in order to ensure the competence of all those who offer their services as fire risk assessors.

Fire control switches in lifts

113.42 All modern lifts are fitted with fire control switches designed to be operated by drop keys to enable the fire and rescue services to take control of them in the event of a fire. We were surprised to learn that at the time of the Grenfell Tower fire there was a significant variation in the dimensions of drop keys available from commercial suppliers, not all of which were compatible with all fire control switches. We were also surprised to learn that, although drop keys for the use of firefighters are provided by fire and rescue services, firefighters commonly obtain their own from a variety of sources. As a result, it appears to have been largely a matter of chance whether the key carried by the first firefighter who tried to take control of a lift was capable of operating the switch. That is clearly unacceptable and may result in unnecessary casualties, as it did at Grenfell Tower.

113.43 We understand that since the problem came to light the LFB has taken steps to ensure that only drop keys of an approved pattern are carried by its firefighters. The evidence does not enable us to assess with any confidence whether similar problems have been encountered by other fire and rescue services and, if so, what steps they have taken in response. Accordingly, we are not in a position to determine whether greater standardisation of fire control switches and keys is required. **We therefore recommend** that the government seeks urgent advice from the Building Safety Regulator and the National Fire Chiefs Council on the nature and scale of the problem and the appropriate response to it.

Pipeline isolation valves

113.44 Pipeline isolation valves are a critical part of the gas distribution network because they are intended to enable the supply of gas to be shut off quickly in an emergency. At the time of the fire at Grenfell Tower the valves could not be operated because they had been covered over in the course of hard landscaping. There was evidence that it was a common problem in the industry for pipeline isolation valves to be lost in that way. In our view that poses an unacceptable risk to health and safety and could have significant consequences. **We therefore recommend**

that every gas transporter be required by law to check the accessibility of each such valve on its system at least once every three years and to report the results of that inspection to the Health and Safety Executive as part of its gas safety case review.

Ageing pipework

113.45 One of our expert witnesses, Mr Rodney Hancox, drew our attention to the danger posed by the fact that the internal gas pipework in some older buildings is not sleeved where it passes through walls and floors, as is now required by the Gas Safety Regulations 1972. He considers that a more active approach to replacement should be taken to avoid a serious leak with potentially catastrophic consequences.¹³ Although we are not in a position to make a formal recommendation to that effect, we think that the Health and Safety Executive and other relevant bodies should give careful consideration to his evidence.

Social housing providers

113.46 In Parts 4 and 5 of the report we have discussed the TMO, its relationship with its residents and its management of fire safety at Grenfell Tower.

¹³ See his reports at {RHX00000012/220} paragraphs 468-469, {RHX00000020/2-17} paragraphs 1-45 and his oral evidence at Hancox {Day161/181-204}.

We make a number of criticisms of the way in which it carried out its responsibilities, including in relation to handling complaints, remedying defects identified in fire risk assessments, installing and maintaining fire protection systems and routine inspection and maintenance of fire doors. Others responsible for the management of social housing should give them careful consideration and take appropriate action accordingly.

113.47 In other circumstances shortcomings of those kinds would probably have led us to make a number of recommendations directed to ensuring that they were rectified and not repeated. However, since the fire Parliament has enacted the Social Housing (Regulation) Act 2023, which enables the Regulator of Social Housing to play a more active role in setting appropriate standards and ensuring that they are met. The regulator also has the power to set standards on the competence and conduct of those involved in the provision of services relating to the management of social housing and to require providers of social housing to make information available both to tenants and the regulator. The Act also makes safety a priority and imposes a duty on landlords to investigate and remedy within a specified time of being reported defects that may adversely affect health.

113.48 In those circumstances, we do not consider it necessary to make any additional recommendations in relation to the matters that we have uncovered.

The London Fire Brigade

113.49 Our criticisms of the London Fire Brigade have been directed mainly to its failure to integrate the control room into the organisation effectively, its failure to ensure that adequate training was provided to control room staff in handling fire survival guidance calls and its failure to implement lessons learnt from previous incidents. In one way or another those are all criticisms of the organisation and management of the brigade, which in our view needs to become more streamlined and less bureaucratic.

113.50 Although the LFB is the country's largest fire and rescue service and is subject to a range of demands not imposed on similar services, it has tended to adopt an insular approach and to be reluctant to learn from others. No doubt some of the criticisms we have made of the LFB could be made of other fire and rescue services, but in any event we think that there is scope for all fire and rescue services to learn from each other's experience and thereby

to promote best practice across the board, whether in relation to recruitment, training, organisation or management.

A College of Fire and Rescue

113.51 Although the National Fire Chiefs Council provides a forum for discussions and the formulation of policy, there is currently no central body that is equipped to provide education and training across the board to nationally approved standards. We welcome the government's ambition to create an independent College of Fire and Rescue expressed in the white paper *Reforming our Fire and Rescue Service*¹⁴ and **we therefore recommend** that the government establish such a college immediately with sufficient resources to provide the following services nationally:

- a. practical training at all levels supplementary to that provided by individual fire and rescue services;
- b. education in the form of lectures and seminars on different aspects of the work of the fire and rescue services in order to share experience and promote good practice;

¹⁴ CP 670

- c. research into matters that may affect the work of the fire and rescue services, including major fires;
- d. the development of equipment, policies and procedures suitable for ensuring the effectiveness of fire and rescue services nationally and the safety of firefighters and the public;
- e. setting and maintaining national standards of managerial competence for senior managers, including control room managers, and providing management training for, and regular assessment of, senior ranks by reference to such standards.

113.52 The constitution of the College of Fire and Rescue is a matter for the government in consultation with the National Fire Chiefs Council and other interested bodies, but it could be established as a not-for-profit company, independent of the government, with a board of directors drawn from a range of backgrounds, a significant proportion of whom are currently serving Chief Fire Officers or senior officers with significant firefighting experience. The board would be responsible for the overall management and operations of the college.

113.53 Although it is for the government to decide how the college should be constituted, **we recommend** that it should have a permanent staff of sufficient size to manage its operations and develop its functions in response to the demands of fire and rescue services nationally and the requirements of the board. The college will need access to permanent facilities, including facilities for practical training and education. We envisage that much of the training and education will be delivered and led by firefighters of suitable experience drawn as the occasion requires from fire and rescue services around the country.

The control room

113.54 The control room should be at the heart of any fire and rescue service and should, therefore, be recognised as a key part of the organisation and fully integrated into it. Its staff must be trained to handle whatever demands are reasonably foreseeable.

113.55 The demands imposed on the LFB's control room by the Grenfell Tower fire were very great, but even so, its performance did not meet reasonable expectations. That was principally the result of inadequate training and a failure to carry out regular exercises, itself the result of poor management. The establishment of a College of Fire and Rescue could be expected to

create improvements in all those areas by setting standards for training, by training more senior ranks to perform management roles effectively and by sharing best practice. In the meantime, **we recommend** that His Majesty's Inspectorate of Constabulary and Fire and Rescue Services ("the Inspectorate") inspect the LFB as soon as reasonably possible to assess and report on:

- a. the extent to which the control room is now integrated into the organisation;
- b. the effectiveness of the arrangements for identifying the training needs of control room staff, delivering effective training and recording its outcomes;
- c. the effectiveness of the control room generally;
- d. the ability of the control room to handle a large number of concurrent requests for advice and assistance from people directly affected by fires or other emergencies; and
- e. the quality and effectiveness of the arrangements for communication between the control room and the incident commander.

Incident commanders

113.56 In Chapter 72 we are critical of the LFB's arrangements immediately before the Grenfell Tower fire for assessing the competence of those expected to act as incident commanders,

particularly in the early stages of the response to a fire in a high-rise residential building. Steps have already been taken to respond to the criticisms made by the chairman in his Phase 1 report, but in order to reassure those who live in London **we recommend** that as soon as reasonably possible the Inspectorate inspect the LFB to examine and report on the arrangements it has in place for assessing the training of incident commanders at all levels and their continuing competence, whether by a process of revalidation or otherwise.

Operational planning

113.57 In the years before the Grenfell Tower fire the LFB consistently failed to implement an effective system for the collection, storage and distribution of operational risk information, in particular in relation to high-risk, high-rise residential buildings. **We therefore recommend** that as soon as reasonably practicable the Inspectorate inspect the LFB to examine and report on its arrangements for collecting, storing and distributing information in accordance with section 7(2)(d) of the Fire and Rescue Services Act 2004, and in particular its arrangements for identifying high-risk residential buildings and collecting, storing and distributing information relating to them.

Implementing change

113.58 The LFB took steps to examine incidents, collect relevant information, establish boards and committees to digest it and produce appropriate changes to working practices. In most cases, however, the process was excessively bureaucratic and undermined the purpose for which it had been established. As a result, too little of the available information was translated into practical outcomes. **We therefore recommend** that the LFB establish effective standing arrangements for collecting, considering and effectively implementing lessons learned from previous incidents, inquests and investigations. Those arrangements should be as simple as possible, flexible and of a kind that will ensure that any appropriate changes in practice or procedure are implemented speedily.

Communications

113.59 We have explained in Chapter 80 why communication by radio is inherently likely to be adversely affected in certain environments, including tall buildings constructed mainly of dense or reflective materials such as stone, concrete, brick and steel. It is apparent, however, that the use of low-power intrinsically safe radio equipment exacerbates the problem because of its more limited transmission range. In many

firefighting situations the danger of a spark from a radio igniting flammable gases is very low. The fire at Grenfell Tower is one example. We understand that intrinsically safe radios capable of operating at higher power are now available. **We therefore recommend** that fire and rescue services that continue to use low power intrinsically safe radios as part of breathing apparatus consider reserving them only for situations in which there is a real risk of igniting flammable gases and generally using radios of higher power, particularly in high-rise buildings.

- 113.60** There is strong evidence that in general digital radios are more effective than analogue radios. **We therefore recommend** that all fire and rescue services give consideration to providing all firefighters with digital radios.
- 113.61** Since radio communications are inherently unreliable in certain environments, **we recommend** that firefighters be trained to respond appropriately to the loss of communications and to understand how to restore them.

Water

- 113.62** On the night of the Grenfell Tower fire firefighters were unable to distinguish between different types of hydrant. That is a clear indication of a need for better training and **we therefore recommend**

that basic training on the structure and operation of the water supply system, including the different types of hydrants in use and their functions, be given to all firefighters. Training should also be given on effective measures to increase water flow and pressure when necessary.

- 113.63** The Grenfell Tower fire made unusual demands on the supply of water, but other major fires may make similar demands in future. If it becomes necessary to seek the assistance of the statutory water undertaker to increase the volume or pressure of the supply, the fire and rescue service should be able to communicate with it quickly and clearly. **We therefore recommend** that all fire and rescue services establish and periodically review an agreed protocol with the statutory water undertakers in their areas to enable effective communication between them in relation to the supply of water for firefighting purposes.
- 113.64** In paragraph 81.23 of Chapter 81 we considered British Standard 750:2002 relating to the flow coefficient of fire hydrants and noted that the standard does not state whether the figure stated in paragraph 10.2 relates to a simple hydrant tested under factory conditions or to a hydrant installed in the pipework necessary to connect it to the water network. Any confusion could easily be dispelled by a small amendment to the standard. **We therefore recommend** that the

British Standards Institution amend BS 750 to include a description of the circumstances under which the flow coefficient to which it refers in paragraph 10.2 is to be measured.

Deployment of firefighters

113.65 How to deploy the available firefighters must remain the responsibility of the incident commander, who alone can judge how best to make use of the available resources. We also recognise that firefighters must be allowed to exercise discretion in how best to carry out their instructions. However, anyone reading Part 9 of the report will be struck by the number of times crews despatched to the highest floors of the tower in response to calls for assistance failed to reach their destinations because they decided to help people they encountered on the stairs on their way up. We cannot tell whether in any of those cases they would have been able to rescue people higher up the building if they had not done so, but **we recommend** that National Fire Chiefs Council consider whether, and if so in what circumstances, firefighters should be discouraged from departing from their instructions on their own initiative and provide appropriate training in how to respond to a situation of that kind.

Response and recovery

113.66 The Grenfell Tower fire created an emergency on an unprecedented scale as a result of the loss of life, the destruction of so many homes and the displacement of over 800 people who were rendered homeless and, in many cases, for all practical purposes destitute. The arrangements for responding to civil emergencies were severely tested and in many respects did not perform as well as expected. In December 2022 the government published a new *Resilience Framework* and put in place what is described as a new strategic approach to resilience. We welcome those steps. Nevertheless, there remain areas in which we think further improvements need to be made.

The Civil Contingencies Act 2004

113.67 The government's powers in sections 5 and 7 of the Act to intervene in response to an emergency are far-reaching but they do not enable it to intervene promptly or decisively when a Category 1 responder is failing to rise to the challenge. **We therefore recommend** that the Act be reviewed and consideration be given to granting a designated Secretary of State the power to carry out the functions of a Category 1 responder in its place for a limited period of time.

113.68 The response of local voluntary organisations to the disaster demonstrated their capacity to act as valuable partners in responding to an emergency. Regulation 23 of the Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005 requires a Category 1 responder to have regard when making its plans to the activities of relevant voluntary organisations. **We therefore recommend** that the regulation be amended to require Category 1 responders to establish and maintain partnerships with the voluntary, community and faith organisations in the areas in which they are responsible for preparing for and responding to emergencies.

Guidance

113.69 The current guidance on preparing for emergencies is contained in several documents, all of which are unduly long and in some respects out of date. **We recommend** that the guidance be revised, reduced in length and consolidated in one document which lays greater emphasis on the need for those leading the response to consider the requirements for recovery, the need to identify vulnerable people, the importance of identifying and ensuring co-operation with voluntary, community and faith groups and is consistent with the Equality Act 2010. **We also recommend**

that regard for humanitarian considerations be expressly recognised by making it the ninth principle of effective response and recovery.

London Local Authority Gold arrangements

113.70 Although each London borough is a separate Category 1 responder, there are arrangements for promoting resilience across the capital as a whole, in particular through the London Local Authority Gold arrangements. Events demonstrated, however, that there is a need for a clearer understanding of the nature of the London Gold arrangements, in particular in situations in which a single borough is affected. **We therefore recommend** that the guidance on the operation of those arrangements be revised and that existing and newly appointed chief executives be given regular training to ensure they are familiar with its principles.

Local resilience forums

113.71 Our investigations revealed the inability of the London Resilience Forum to monitor the quality of its members' planning, training and preparation for responding to emergencies. Neither *Minimum Standards for London*, which applied at the time, nor its replacement, *Resilience Standards for London*, gave the

local resilience forum any means of securing compliance with the standards they prescribed. We note that in the *Resilience Framework* the government has recognised the need to strengthen local resilience forums. **We therefore recommend** that local resilience forums adopt national standards to ensure effective training, preparation and planning for emergencies and adopt independent auditing schemes to identify deficiencies and secure compliance. **We also recommend** that a mechanism be introduced for independently verifying the frequency and quality of training provided by local authorities and other Category 1 responders.

Local authorities

113.72 The failure of The Royal Borough of Kensington and Chelsea (RBKC) to meet the basic needs of those displaced in the days immediately following the fire demonstrated the need for local authorities to have effective plans in place for providing humanitarian assistance. It also emphasised the need for those plans to be supported by a qualified humanitarian assistance liaison officer (HALO) and for there to be regular practice in putting them into effect. There is scope for all those required to respond to emergencies to learn from each other's experience and promote best practice.

- 113.73** RBKC was not able to provide an effective response to the emergency because it had not made adequate arrangements for staffing the emergency communication centre, had not made adequate provision for humanitarian assistance, including the provision of accommodation and financial support, did not have the ability to keep accurate records of those who needed help and had no effective system for communicating with the public. All those shortcomings could and should be avoided in future by a combination of measures, but underpinning them all is a need for the staff of local authorities to treat resilience and preparedness for emergencies as an essential part of their responsibilities. **We therefore recommend** that local authorities train all their employees, including chief executives, to regard resilience as an integral part of their responsibilities.
- 113.74** RBKC had no effective means of collecting and recording information about those who had been displaced from the tower and surrounding buildings, including those who were missing. Compiling reliable information of that kind is difficult and the challenges likely to be faced by local authority Category 1 responders will vary according to the nature of the emergency. **We recommend** that all local authorities devise methods of obtaining and recording information

of that kind, if possible in electronic form, and practise putting them into operation under a variety of different circumstances.

- 113.75** Any local authority is likely to have difficulty finding temporary accommodation for a very large number of displaced persons but the need to do so should be recognised and contingency plans drawn up. **We recommend** that all local authorities make such arrangements as are reasonably practicable for enabling them to place people in temporary accommodation at short notice and in ways that meet their personal, religious and cultural requirements. Such arrangements should, as far as possible, involve local providers of social housing.
- 113.76** Effective humanitarian assistance is vital in ensuring that those who are most affected by an emergency are treated with dignity and respect and do not suffer additional trauma as a result of an inability to take control of their situation. In the case of the response to the Grenfell Tower fire three matters caused particular resentment: the circumstances surrounding some of the temporary accommodation, the difficulty in obtaining financial support in the days immediately following the fire and breakdowns in the support provided by key workers. Problems arising from the provision of suitable temporary accommodation may be difficult to resolve but other complaints

should be easier to avoid by careful planning.

We recommend that all local authorities include in their contingency plans arrangements for providing immediate financial assistance to people affected by an emergency. **We also recommend** that as part of their planning for emergencies local authorities give detailed consideration to the availability of key workers and the role they are expected to play so that suitable contingency arrangements can be made to ensure, as far as possible, continuity of support.

113.77 One important aspect of humanitarian assistance that was absent following the Grenfell Tower fire was regular communication between those providing assistance and those in need of it. For example, too many people who had been found temporary accommodation felt that they had then been left on their own, not knowing for how long they were expected to remain or on what terms and without anyone to turn to to provide that information. That gave rise to a sense of isolation and powerlessness. **We recommend** that as part of their emergency planning local authorities make effective arrangements for continuing communication with those who need assistance using the most suitable technology and a range of languages appropriate to the area.

113.78 It is also important not to lose sight of those who, although not physically affected by an emergency, may be worried about the safety of friends or relations caught up in it. Again, effective communication is essential. **We recommend** that all local authorities include in their plans for responding to emergencies arrangements for providing information to the public by whatever combination of modern methods of communication are likely to be most effective for the areas for which they are responsible. In future, to avoid confusion, wasted effort and frustration **we also recommend** that what in the past has been called by the police a “casualty bureau” be described in a way that makes it clear that it does not provide information to the public about people affected by the emergency.

Vulnerable people

113.79 We conclude our recommendations by looking back to Phase 1. In the Phase 1 report the chairman recommended 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 evacuate the building without assistance may be compromised (such as persons with reduced mobility or impaired cognition)¹⁵ and

¹⁵ Phase 1 report Volume IV paragraph 33.22(e).

to include current information about them and their associated PEEPs in a premises information box.¹⁶

113.80 The considerations that led him to make those recommendations led us to investigate in Phase 2 why the LGA Guide advised landlords and responsible persons that it was usually unrealistic to plan for the evacuation and assistance in the event of a fire of disabled and vulnerable residents living in general needs blocks of flats, such as Grenfell Tower.¹⁷ That led in turn to our making a number of criticisms of the government and to recommend that the advice in the LGA Guide be reconsidered.¹⁸

113.81 Moreover, the further evidence that we have received in the course of Phase 2 has confirmed us in the view that the responsible person for a general needs residential building should collect sufficient information about vulnerable occupants to enable appropriate measures to be taken to assist their escape in the event of a fire.¹⁹ Much of the evidence relating to the individual deaths set out in Part 9 emphasises the importance of

¹⁶ Phase 1 report Volume IV paragraph 33.22(f).

¹⁷ See Part 2, Chapter 14, paragraph 14.2.

¹⁸ See Part 2, Chapter 14, and especially paragraph 14.17.

¹⁹ Part 5, Chapter 46, paragraph 46.90.

being able to provide the fire and rescue service with reliable information about the vulnerability of those needing to be rescued.

113.82 We therefore recommend that further consideration be given to the recommendations made in the Phase 1 report in the light of our findings in this report.

113.83 We also recommend that the advice contained in paragraph 79.11 of the LGA Guide be reconsidered.

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