Grenfell Inquiry: CIAT's Response
Delegate information and briefing papers/links

Agenda

11:30 Chairman: Alex Naraian, President
The purpose and context of this event is
- to focus upon Dame Judith Hackitt's question;
- to discuss and debate the CIAT Response to the Public Inquiry; and
- for international members to address the questions in part 3.

11:35 Professor Sam Allwinkle PPBIAT MCIAT, Forum Facilitator

11:40 Dr Graham Smith MCIAT and Fire Engineer

12:10 Workshops to debate the key themes, with a workshop lead agreed, to feed back into the main session and to cover the principal issues detailed in the Terms of Reference for the Public Inquiry:
- the design and construction of the building and the decisions relating to its modification, refurbishment and management;
- the scope and adequacy of Building Regulations, fire regulations and other legislation, guidance and industry practice relating to the design, construction, equipping and management of high-rise residential buildings;
- whether such regulations, legislation, guidance and industry practice were complied with in the case of Grenfell Tower and the fire safety measures adopted in relation to it; and

together with the
- international dimension.

12:45 Feedback from Workshops

13:15 Plenary session and summary

13:30 **END**

Outcomes: CIAT to feed its comments directly into the Public Inquiry and CIC.

- Event to be recorded
- Roving microphone so comments can be captured

Introduction from the President

Colleagues, as you are all aware, the Grenfell Tower fire occurred on 14 June 2017 at the 24-storey Grenfell Tower block of, built as social housing, flats in North Kensington, Royal Borough of Kensington and Chelsea. It resulted in an estimated 80 deaths, and over 70 injuries, but a definitive death toll is not expected before 2018. As of 27 September 2017, 68 victims have been identified by the Metropolitan Police and Coroner. Occupants of 23 of the 129 flats died and around 255 people survived. Inquests for 60 known victims were opened and adjourned at Westminster Coroner's Court.

The Grenfell Tower Inquiry held its first hearing on 14 September 2017 and evidential hearings started in October. Police and fire services believe the fire started in a fridge-freezer on the fourth floor. The rapid growth of the fire is thought to have been accelerated by the building's exterior cladding, which is of a common type in widespread use. An independent review of Building Regulations and fire safety is in progress.

As a Chartered professional body, we are heavily involved in the enquiry with DCLG, CIC and the Scottish Government Review of fire safety regulations. We have the opportunity to make a major contribution to the investigations and necessary changes to policy, practice, procurement and production through design and construction and the long-term performance and use of buildings for the health and safety of the occupants.

Our collective voice is important and our contributions are welcomed by Government, policy makers, industry bodies, fellow professionals and the public.

This tragedy impacts how we and the industry works and will need to function in the future across the UK and internationally. CIAT is an international body with expertise and experience from around the world to draw from and also has a duty as a Chartered Body to society, wherever its members are based and practise.

At the Forum we have the opportunity to reflect on the questions posed by Dame Judith Hackitt together with the CIAT response and input from our members who are involved with Grenfell. However, it is more important for us to hear what you have to say and what input and comments you can make that will help form and shape our responses.

We plan to publish our views and opinions and what we believe needs to change across the industry to make buildings safer for all users.

Thank you in advance and we look forward to listening to the discussions and contribution to this significant event.

November 2017

Reference material

The information provided as background is as follows

PART 1
REVIEW OF BUILDING STANDARDS (FIRE SAFETY) AND
UK GOVERNMENT INITIATIVES FOLLOWING GRENFELL TOWER FIRE

PART 2
CALL FOR EVIDENCE — QUESTIONS
Overarching legal requirements

PART 3
CIAT international members
International comparison: Building Regulations and standards (fire and safety)

ANNEX A
Independent Review — Building Regulations and Fire Safety: CIAT's Response

The purpose and context of this event is

- to focus upon Dame Judith Hackitt's question;
- to discuss and debate the CIAT response; and
- for international members to address the questions in part 3.

Useful links:
https://www.gov.uk/government/collections/grenfell-tower
https://www.gov.uk/guidance/building-safety-programme
https://www.gov.uk/government/news/statement-from-the-independent-expert-advisory-panel-30-june-2017
https://www.gov.uk/government/news/new-industry-group-to-ensure-construction-sector-ready-to-meet-building-challenges-after-grenfell-tower
https://www.bre.co.uk/grenfelltower
https://www.grenfelltowerinquiry.org.uk/about/terms-of-reference/
https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-terms-of-reference

PART I

REVIEW OF BUILDING STANDARDS (FIRE SAFETY) AND UK GOVERNMENT INITIATIVES FOLLOWING GRENFELL TOWER FIRE

Introduction

Following the Grenfell Tower fire in London on 14 June 2017, the UK Government has provided extensive advice to residents, building owners and landlords on actions to be taken including advice on appropriate mitigation measures if necessary. A dedicated Grenfell Tower website has been set up by the Department of Communities and Local Government (DCLG) to provide detailed information relating to the fire at Grenfell Tower https://www.gov.uk/government/collections/grenfell-tower. Sir Martin Moore-Bick has been appointed to head the Public Inquiry into the Grenfell Tower fire. The Inquiry has been established under the 2005 Inquiries Act, with full powers, including the power to compel the production of documents, and to summon witnesses to give evidence on oath. The Inquiry will be held in public, https://www.grenfelltowerinquiry.org.uk/about/terms-of-reference/.

Dame Judith Hackitt has been appointed to chair an Independent Review of Building Regulations and Fire Safety in England. The Review's two key priorities are to develop a more robust regulatory system for the future and provide further assurance to residents that the buildings they live in are safe and remain safe, https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-terms-of-reference.

DCLG published updated and consolidated advice on 5 September 2017 for building owners following large scale fire testing carried out by the Building Research Establishment. The advice and summary of the large scale fire tests has been reproduced at C) below.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643281/Update_and_consolidated_advice_for_building_owners_following_large-scale_testing.pdf

GRENFELL TOWER INQUIRY

On 15 August 2017, the Inquiry's Terms of Reference were published.

1. To examine the circumstances surrounding the fire at Grenfell Tower on 14 June 2017, including:
   a) the immediate cause or causes of the fire and the means by which it spread to the whole of the building;
   b) the design and construction of the building and the decisions relating to its modification, refurbishment and management;
   c) the scope and adequacy of Building Regulations, fire regulations and other legislation, guidance and industry practice relating to the design, construction, equipping and management of high-rise residential buildings;
   d) whether such regulations, legislation, guidance and industry practice were complied with in the case of Grenfell Tower and the fire safety measures adopted in relation to it;
   e) the arrangements made by the local authority or other responsible bodies for receiving and acting upon information either obtained from local residents or available from other sources (including information derived from fires in other buildings) relating to the risk of fire at Grenfell Tower, and the action taken in response to such information;
   f) the fire prevention and fire safety measures in place at Grenfell Tower on 14 June 2017;
   g) the response of the London Fire Brigade to the fire; and
   h) the response of central and local government in the days immediately following the fire.

2. To report its findings to the Prime Minister as soon as possible and to make recommendations.

The Grenfell Tower Inquiry has published a list of issues on which the Inquiry's investigations will focus. The issues in this list may be subject to revision during the course of the Inquiry.

THE INDEPENDENT REVIEW OF BUILDING REGULATIONS (FIRE AND SAFETY)

In light of the system failures which have been revealed by testing carried out in the wake of the Grenfell Tower disaster, Government has commissioned an urgent, independent review of building and fire safety regulations and their effectiveness.

The independent Review of Building Regulations and Fire Safety is being led by Dame Judith Hackitt. The Review will urgently assess the effectiveness of current building and fire safety regulations and related compliance and enforcement issues, with a focus on multi occupancy high rise residential buildings.

This will include addressing whether the government's large-scale cladding system testing programme identified any potential systemic failures.

The Review's two key priorities are to develop a more robust regulatory system for the future and provide further assurance to residents that the buildings they live in are safe and remain safe. While the Review will cover the regulatory system for all buildings, it will have a specific focus on multi occupancy high-rise residential buildings.

The Review will report jointly to Communities Secretary, Sajid Javid and Home Secretary, Amber Rudd. An interim report will be submitted in autumn 2017 and a final report submitted in spring 2018. The Review will co-operate fully with the Public Inquiry, and Dame Judith Hackitt will review her recommendations in the light of the findings of the Inquiry.

Terms of Reference

The Review will draw upon international experience of regulatory frameworks and the frameworks covering other industries where exceptional events can lead to the risk of large-scale fatalities.

In reaching its conclusions, the Review will:

- map the current regulatory system (i.e. the regulations, guidance and processes) as it applies to new and existing buildings through planning, design, construction, maintenance, refurbishment and change management;
- consider the competencies, duties and balance of responsibilities of key individuals within the system in ensuring that fire safety standards are adhered to;
- assess the theoretical coherence of the current regulatory system and how it operates in practice;
- compare this with other international regulatory systems for buildings and regulatory systems in other sectors with similar safety risks; and
- make recommendations that ensure the regulatory system is fit for purpose with a particular focus on multi-occupancy high-rise residential buildings.

The Review will seek the input of relevant stakeholders and will work closely with other Government Departments. It will make recommendations in light of the evidence gathered. These recommendations can cover changes or clarifications required to any part of the system or recommendations for further work Government needs to carry out. In doing so it will consider the implications of changes on wider government objectives (including housing supply and rent levels).

The Review will run in parallel with the work of the Statutory Inquiry headed up by Sir Martin Moore-Bick and will co-operate fully with the Public Inquiry. The Review will submit an interim report to the Secretary of State for Communities and Local Government and the Home Secretary in autumn 2017. The Government will work closely with the Chair to identify whether there are changes in this report that can be implemented while the Review's work continues. The Government will provide an initial written response alongside the report laid before Parliament. The Review will submit its final report jointly to the Secretary of State for Communities and Local Government and the Home Secretary in spring 2018. The Government's response to the final report will also be laid before Parliament.

By regulatory system, Dame Hackitt means the current framework of building, housing and fire safety legislation and associated guidance which create a framework through which fire safety is embedded, assessed and assured through the full life cycle of a building. The Review is interested in anything that may impact on that lifecycle including any wider cultural issues which impact on the focus given to maximising fire safety. In particular it means the totality of the system that is constructed from the following parts:

The legal requirements: the specific requirements which legislation and guidance set out as needing to be met to ensure fire safety at all key stages in the life-cycle of a building. This includes both the planning, design, procurement and construction of new builds and the refurbishment of existing buildings and the on-going management and maintenance of those buildings.

Roles and responsibilities: the roles and responsibilities of different individuals/organisations at each key stage of the process above to either: (a) ensure that all of the relevant requirements have been fulfilled; or (b) to formally assess (i.e. to make the statutory assessment) that this is the case.

Compliance processes: the formal processes such individuals/organisations with specific responsibilities have to go through to prove compliance and the culture surrounding compliance; Independent Review — Building Regulations and Fire Safety.

Competency: the competency requirements placed on all of those with responsibilities to ensure or formally assess compliance (i.e. skills, technical qualifications, any CPD/ re-accreditation requirements).

Enforcement and sanctions: the enforcement and sanctions regime and culture that applies where building/fire safety requirements are assessed to have not been complied with.

Quality Assurance: The broader processes whereby specific products used in the building, refurbishment and maintenance of the buildings are certified as meeting particular safety standards.

Dame Judith Hackitt has called for evidence on the regulatory system and has asked respondents for their opinions on the current regulatory system, what is working well and what aspects could be reformed to enhance fire safety. There is a particular focus in the Review on the regulatory system insofar as it applies to multi occupancy high-rise residential buildings. However, respondents have been advised not to limit themselves to these types of buildings if there are broader points they wish to make. **Responses were due by 13 October 2017 and are currently being analysed.**

PART 2
CALL FOR EVIDENCE — QUESTIONS
[See Annex A for CIAT's Response]

Overarching legal requirements
Q1: To what extent are the current building, housing and fire safety legislation and associated guidance clear and understood by those who need to follow them? In particular:
- What parts are clear and well understood by those who need to follow them?; and, if appropriate
- Where specifically do you think there are gaps, inconsistencies and/or overlaps (including between different parts of the legislation and guidance)? What changes would be necessary to address these and what are the benefits of doing so?

Roles and responsibilities
Q2: Are the roles, responsibilities and accountabilities of different individuals (in relation to adhering to fire safety requirements or assessing compliance) at each key stage of the building process clear, effective and timely? In particular:
- Where are responsibilities clear, effective and timely and well understood by those who need to adhere to them/assess them?; and, if appropriate
- Where specifically do you think the regime is not effective?
- What changes would be necessary to address these and what are the benefits of doing so?

Q3: Does the current system place a clear over-arching responsibility on named parties for maintaining/ ensuring fire safety requirements are met in a high-rise multi occupancy building? Where could this be made clearer? What would be the benefit of doing so?

Competencies of key players
Q4: What evidence is there that those with responsibility for:
- demonstrating compliance (with Building Regulations, housing & fire safety requirements) at various stages in the life cycle of a building;
- assessing compliance with those requirements
  are appropriately trained and accredited and are adequately resourced to perform their role effectively (including whether there are enough qualified professionals in each key area)? If gaps exist how can they be addressed and what would be the benefits of doing so?

Enforcement and sanctions
Q5. Is the current checking and inspection regime adequately backed up through enforcement and sanctions? In particular:
- Where does the regime already adequately drive compliance or ensure remedial action is always taken in a timely manner where needed?
- Where does the system fail to do so? Are changes required to address this and what would be the benefits of doing so?

Tenants' and residents' voice in the current system
Q6: Is there an effective means for tenants and other residents to raise concerns about the fire safety of their buildings and to receive feedback? Where might changes be required to ensure tenants'/residents' voices on fire safety can be heard in the future?

Quality Assurance and testing of materials
Q7: Does the way building components are safety checked, certified and marketed in relation to Building Regulations requirements need to change? In particular:
- Where is the system sufficiently robust and reliable in maximising fire safety and, if appropriate
- Where specifically do you think there are weaknesses/gaps? What changes would be necessary to address these and what would be the benefits of doing so?

Differentiation within the current Regulatory System

Q8: What would be the advantages/disadvantages of creating a greater degree of differentiation in the regulatory system between high-rise multi occupancy residential buildings and other less complex types of residential/non-residential buildings?

Where specifically do you think further differentiation might assist in ensuring adequate fire safety and what would be the benefits of such changes?

International comparisons and other sectors

Q9: What examples exist from outside England of good practice in regulatory systems that aim to ensure fire safety in similar buildings? What aspects should be specifically considered and why?

Q10: What examples of good practice from regulatory regimes in other industries/sectors that are dependent on high quality safety environments are there that we could learn from? What key lessons are there for enhancing fire safety?

- References to 'fire safety' requirements in Q2 & 3 should be taken to cover the range of requirements set out across Building Regulations, the Fire Safety Order etc.
- In other words the planning, design, procurement and construction of new builds and the refurbishment of existing buildings and the ongoing management and maintenance of those buildings
- For example, designers, those with responsibility for installing products, those undertaking Building Control sign-off or fire protection and enforcement work
- For example in terms of higher competency requirements, pro-activity/frequency of safety sign-off

PART 3

CIAT international members
International Comparison: Building Regulations and Standards (Fire and Safety)

Introduction

Following the Grenfell Tower fire in London on 14 June 2017, it is believed that up to 80 residents died as a result. The UK Government continues to reassure residents and provide advice on appropriate mitigation measures. A dedicated Grenfell Tower website has been set up to help keep people informed and safe.

The Grenfell Tower Inquiry has begun and the Prime Minister has announced an Independent Review of Building Regulations and Fire safety in England. In Scotland, a Ministerial Working Group has been established to oversee a review of the building regulatory and fire safety frameworks.

The primary focus of the on-going investigation into the fire spread on Grenfell Tower is on the external wall cladding and how it contributed to the rapid fire spread. The UK Government has published the results of seven large scale fire tests using thin Aluminium Composite Material (ACM) with three categories of filler material and 2/3 types of insulation exposed in the cavity. A summary of the results, consolidated advice and latest mitigation measures have also been published.

Q1: What fire tests are specified in your national building code for materials and components used in external wall cladding systems? [Please specify]

Q2: What performance criteria are specified in your national building code for the fire classification for external wall cladding used on:

High rise buildings (where the topmost floor level is more than 18m (more than six storeys) above the ground)

a) High rise domestic buildings (flats or apartments)? [Please specify]
b) High rise non-domestic residential buildings (hotels, hospitals, hostels etc.)? [Please specify]
c) High rise non-domestic non-residential buildings (offices, shops, leisure and assembly Buildings etc.)?

Low rise buildings (where the topmost floor level is not more than 18m (up to six storeys) above the ground)

d) Low rise domestic buildings (flats or apartments, houses)? [Please specify]
e) Low rise non-domestic residential buildings (Hospitals, care homes, hostels, hotels etc.)? [Please specify]
f) Low rise non-domestic non-residential buildings (offices, shops, leisure and assembly buildings, storage and industrial etc.)? [Please specify]

Q3: Does your national building code require two escape stairs from high rise domestic buildings? [Yes/No]

If yes, at what height above the ground are two escape stairs required? [Please specify]

Q4: Does your country require life safety fire sprinkler systems to be installed in high rise domestic buildings? [Yes/No]

Q5: Does your country require existing buildings to be retrofitted with life safety fire sprinkler systems? [Yes/No] If yes, please specify what building types. [Please specify]

ANNEX A

Independent Review – Building Regulations and Fire Safety: CIAT's Response

CIAT is the qualifying body for Architectural Technology professionals.

Architectural Technology is the technology of architecture; a creative, innovative design discipline rooted in science and engineering, and an integral discipline within the built environment.

As a design function, it relates to the anatomy and physiology of buildings and their production, performance and processes based upon the knowledge and application of science, engineering and technology, which are compliant with regulatory, statutory and legal requirements.

Architectural Technology achieves efficient and effective construction and robust sustainable design solutions that perform and endure over time.

Our members' competencies are innovative, creative and practical. Their fundamental skills include the ability to consider design holistically taking into account all aspects of the composition. This includes the vision to run and lead projects from inception to completion, evaluating the client requirements balanced with the performance of the building together with its impact on the environment and the safety of its users.

The overarching legal requirements

Q1 To what extent are the current building, housing and fire safety legislation and associated guidance clear and understood by those who need to follow them? In particular:

- **What parts are clear and well understood by those who need to follow them?; and, if appropriate**
- **Where specifically do you think there are gaps, inconsistencies and/or overlaps (including between different parts of the legislation and guidance)?**

What changes would be necessary to address these and what are the benefits of doing so?

Summary:

1. The Regulations need to be well understood by all.
2. There is a need for an holistic approach to any review of the Regulations and associated guidance and standards.
3. Whilst considering a review, a proportional position needs to be taken.
4. We would suggest a need to take an overview of existing work which could feed in and add value with common themes being considered – in particular:
   - Edinburgh Schools – Cole Report
   - HSE – Implementation of CDM Regulations 2015 – aiming to provide different guidance to different users to suit them
5. There is also a need to be ensure that a review is comprehensive and looks at broader issues, for example, sustainability, heritage, conservation, environment

Specifics:
The Regulatory Reform (Fire Safety) Order 2005 (RR(FS)O) is considered adequate in its intent. A key issue arises with the fire risk assessment and the competency of the assessor. Minimum training requirements and certification should be required for this task – with appropriate sanction for errors. In this process, please consider consolidating the Fire Safety (Employee's Capabilities) (England) Regulations 2010.

Continuity between the 'design side' of Building Regulations and the 'operational side' of the RR(FS)O should be sought.

Building Design
The Building Regulations 2010 are clear. Guidance documents Approved Document B (ADB) and BS-9999 contain sections and clauses open to interpretation. The deemed to satisfy solution in Diagram 40 in ADB and Figure 45 in BS-9999 have led to very tall buildings not meeting the words of the regulation – i.e. 'shall adequately resist the spread of fire'. This is because only the external surface is considered – any build-up of material behind the external surface can be installed. Given the amount of buildings failing the BRE tests in July 2017, it would seem that people have followed deemed-to-satisfy guidance when it was inappropriate to do so in order to meet the actual regulation of B4.

The regulatory expectations, via consistent language, would provide better direction if they followed into guidance documents. This would reduce the amount of interpretation. One example: Diagram 40 in ADB shows a measurement from ground level to the top the building, when in actual fact the dimension required is the Fire and Rescue Service access level to the occupied top floor. ADB needs a complete review and items mirrored in BS-9999 from ADB also need updating accordingly.

Building in Use
Every year, gas safety certificates are required in homes. There is no corresponding power of inspection for fire safety, particularly for fire risk assessment purposes. Fire risk assessors presently stop at the door of the tenant/owner apartment in tower blocks and thus the assessment concerns the common parts only. This partial approach is a grave shortcoming and need redress. There should be congruence between electrical (particularly with 'white goods'), gas and fire safety law.

In the United Arab Emirates (UAE), tenants are pro-active stakeholders via the 2017 Life Safety Code. They have statutory obligations to satisfy so that residents do not pose a disproportionate risk to others in the same tower block. This should be considered for high-rise blocks in England. Such tenants should not pose a disproportionate fire risk to their fellow residents through thoughtless action or carelessness about fire safety. The government has a model contract for short-hold tenancies and this could be updated to include for tenant and landlord obligations with respect to fire safety, consolidating the need for smoke alarms in The Smoke and Carbon Monoxide Alarm (England) Regulations 2015.

The Furniture and Furnishings (Fire Safety) Regulations 1988 (as amended in 1989, 1993 and 2010) should be updated with a new section for toxicity requirements for high-rise premises. London Underground has a fire safety standard for toxicity (1-085) which applies to sub-surface stations, some as deep as 45m below street level like the DLR at Bank station. Thought should be put to toxicity requirements for furniture and furnishings when people live and sleep circa 45m above street level as far as is reasonably practicable to do so. Common parts of tower blocks can straightforwardly meet equal toxicity requirements as for underground rail stations, whereas resident's homes cannot. However, the following is suggested to improve the present ungoverned situation:

- Furniture makers for high rise accommodation should evidence that combustible furniture materials do not contain halogens, nitrogen or sulphur due to their toxic fume emission consequences. All layers of composite materials must be tested.

- Upholstered furniture to comply with the performance requirements for medium hazard in BS-7176 and should be resistant to the following ignition sources: smouldering cigarette (BS EN 1021-1, match flame equivalent (BS EN 1021-2) and flaming ignition source 5 in section 4 of BS-5852.

- Filling materials for use in new furnishings should be restricted to 'combustion modified foam' or other materials having at least the same standard of fire performance.

- Consider review of Ministry of Defence standards for places of detention for permitted mattress specifications in high rise.

The market will respond if regulations are updated for furniture products that needs to meet BS ISO 1716 or BS ISO 1182 and similar robust testing. No individual item of furniture should support flashover in test conditions.

Renovation/Refurbishment

Further answers and solutions to residential high rise exist in adjacent industries – for example, consider the rigour of the nuclear safety case when renovations are made to nuclear significant buildings. Consider applying equal rigour to high rise residential properties undergoing renovation and refurbishment, and consider extending this philosophy to buildings with high populations of mobility impaired persons such as hospitals and care homes.

The Construction (Design and Management) Regulations 2015 (CDM) could be the 'glue' to support a process for rigour, and to establish design and operational certainty via collaboration at each stage of a building's design life. During design, fire safety engineered solutions are currently promulgated through the BS-7974 qualitative design review (QDR) process – it is interactive, supports co-ordination and the cohesion of an integrated fire safety design. Regulators helpfully attend to provide critical review.

A debate between a 'performance-based', goal orientated approach versus and prescriptive approach is therefore the wrong conversation. The right conversation is to get quality assured certainty over 'silo mentality' uncertainty which risks gaps in safety. A 'defence in depth' approach via interdisciplinary sessions can systematically address protecting societal fire risk concerns so that a wide range of stakeholders understand the balance of critical design and operational interfaces. Hence a role for the QDR process, with key stakeholders invited to tailored workshops that ensure the correct design and management checks and balances are in place.

Design features must always be balanced against operations, and they must be proportionate to not unduly burden management beyond what is reasonable to cope with.

Retrospective changes can also be evaluated via a CDM-QDR process with the right team composition to avoid unintended consequences. Hence, the nuclear safety case mentality recommendation.

To conclude, no major disaster in the UK has kept a statutory bar in place – e.g. the RMS Titanic, MS Herald of Free Enterprise Ferry (Zeebrugge) and the Marchioness/Bowbelle disasters all improved safety at sea / on waterways, and major fires at Bradford City and King's Cross led to legislative changes at sports grounds and sub-surface rail stations respectively. Grenfell Tower will doubtless lead to changes in regulations.

The above signposts hopefully support that process.

The perennial performance/prescription issue:
Debates about prescription against performance is a false dichotomy. As noted, the issue is about design and management certainty versus uncertainty. Airports are a good example by which to illustrate this – there is no fire safety standard for airports (although BS-9993 is the draft identifier for such a standard). Airports must provide fire precaution measures to address societal risk for passengers, exacerbated by landside/airside movement restrictions and situations of perturbation. This can solved by systematically appraising each fire precaution measure and applying a safety margin – e.g. add a percentage to means of escape width for areas like Departures where baggage carrying is high - a so-called 'baggage correction factor' by Manchester Airport Group. Only a person with relevant industry experience would understand what rules to adopt where and why, leaving the graduate or fire safety professional without that sector experience in the dark.

Prescription thus has its place and the progressive framework rising through ADB, BS-9999 and BS-7974 to a goal-based approach provides a balance for the variety of building types in this country. This does not mean, however, that guidance is suitable where particular building types are not discussed within such guidance – as is the case for high rise residential buildings. Even BS-9991, clause 0.7 suggests adopting a fire engineering (QDR) process for buildings over 50m in height to double-check BS-9991 recommendations are adequate. This reinforces the use of an interdisciplinary QDR process to avoid unintended consequences for other parts of Building Regulations.

Future direction:
Building Regulations do not cover property protection, business criticality, environmental damage (as a result of fire or for fire water containment – both from sprinklers or fire hoses), and reputational damage – to an organisation or the UK overall. Life safety requirements should always form the minimum benchmark, however these other elements can be covered in a graduated approach, much like the ADB, BS-9999, BS-7974 series at present, to suit client objectives against nationally recognised benchmarks that insurers and other key stakeholders endorse. Indeed, environmental damage provides a very positive contribution to other parts of the Buildings Regulations and similar synergies ought to be identified and mapped into a matrix to support consistent application.

For example: interaction between sustainability and fire concerns solar panels which present fire risks on building roofs, so express consideration of this in revised guidance matrix would be welcomed.

The industry is presently faced with qualitative desktop studies and an engineering judgement or full scale testing. It is understood that the BRE will not accept more tests this year. The qualitative desktop studies are not underpinned by quantitative validation; thus they stand, or fall, on the engineer's due diligence, expertise and attitude to risk (professional and technical). This is not sustainable because some engineers and/or the companies who employ them will not accept the professional liability. An incorrect assessment, however slight in error, could lead to different management decisions and resulting procedures that are themselves inadequate when called upon in case of fire (compound error). This compound error is exacerbated by specifying say, a cladding product known to have passed a BS 8414 in a different configuration to the test laboratory conditions and it could also have been poorly installed. What chance for the desktop study?

What is required, to provide certainty, is a robust set of fire safety details for Part B compliance as was procured for Part L back in 2007. These details would include cladding system build-ups approved for use, how to interface junctions, and how fire stop in wall cavities, etc. This would restore industry confidence and provide clients of all backgrounds with the assurance they need.

A second issue is that of as low as reasonably practicable (ALARP), and its application to decision making. ALARP is sometimes concluded at a qualitative stage, but it can extend to quantitative studies such as cost-benefit analysis and gross disproportion. John Locke, then director-general of the HSE, gave evidence at the Sizewell B public enquiry to set out a framework for gross disproportion, yet no HSE algorithm provides a benchmark for various building types. Locke suggested a figure of 3 times the value of preventing a fatality where workers are present (e.g. industrial), but up to 10 time depending on risk, with consequence and likelihood considered. The present value of preventing a fatality in the UK is circa £2millions.

Another recent societal risk criteria, given by HSE, is that the frequency of events involving 50 or more people should be less than once every 5,000 years (i.e. 2×10^{-4} per year). This is the criterion for a single major industrial activity (at a single site).

ALARP is mainly concentrated on high hazard sites and the risk they pose to surrounding settlements rather than large public buildings with thousands of people inside of them, or high rise residential. Gross disproportion should rise from 10 times to 80 times, given the death toll at Grenfell. In so doing, this 'Grenfell gross-disproportion factor' enshrines the event in memory, respects the magnitude of the fatalities (i.e. a realised fire and its consequences) for people making decisions on this basis. Raising the bar by this much also steers the ALARP argument away from trading fatality prevention against the cost, inconvenience and timescales of introducing a safety measure. The Prime Minister's view of not tolerating a similar event in years to come becomes a more realistic proposition.

Roles & Responsibilities

Q2 Are the roles, responsibilities & accountabilities of different individuals (in relation to adhering to fire safety requirements or assessing compliance) at each key stage of the building process clear, effective and timely? In particular:

- **Where are responsibilities clear, effective and timely and well understood by those who need to adhere to them/assess them?; and, if appropriate**
- **Where specifically do you think the regime is not effective?**
- **What changes would be necessary to address these and what are the benefits of doing so?**

Summary:

1. Clarity on timings of inspections needs to be given.
2. Proportional measures in line with the complexity of projects need to be determined to establish levels of expertise needed. A one size fits all attitude does not work and may impede different types of buildings progressing. The need to recognise limits and know when to employ specialist services is key.
3. To encourage effective inspecting, a "team" approach should be encouraged and in particular where different individuals are in a position of responsibility throughout the project and after handover.
4. Effective compliance and enforcement will assist. This needs to be clearly understood and not impossible to achieve.
5. More effective two-way communication from design to site operatives.

Specifics:

Responsibilities

The 'person in charge' changes from feasibility studies through to building management in use. However, there is always a dominant role at each stage and this should be framed in law for audit trail purposes. The RIBA Plan of Work could be used to support this process, with key information packages detailed for when the 'person in charge' hands the baton to the next 'person in charge' in the design and/or construction/use/maintenance/demolition life cycle of a building.

It is possible to visualise it like an Olympic 4x100m relay – with the baton containing the right information handed over for the next person to run with. Everyone knows who the runner is during a race, and so everyone should know who the 'person in charge' is as well during the life time of a project at any particular stage.

Q3 Does the current system place a clear over-arching responsibility on named parties for maintaining/ ensuring fire safety requirements are met in a high-rise multi occupancy building? Where could this be made clearer? What would be the benefits of doing so?

No - see response to question 2.

Competencies of key players

Q4 What evidence is there that those with responsibility for:

- **Demonstrating compliance (with building regulations, housing & fire safety requirements) at various stages in the life cycle of a building;**
- **Assessing compliance with those requirements**

are appropriately trained and accredited and are adequately resourced to perform their role effectively (including whether there are enough qualified professionals in each key area)? If gaps exist how can they be addressed and what would be the benefits of doing so? Enforcement & Sanctions

Summary:

1. There does not appear to be an effective system in place.
2. There are methods of assessing competence in particular areas but not all in one place
3. An identifiable accreditation system needs to be set up perhaps looking at parts of PAS91 (which is under review in line with CDM) where a particular level of competence is defined and perhaps more detail with specific CPD. Although again, this should be proportionate.
4. Key checks to be suggested.
5. Perhaps looking at the IEE model of Wiring Regulations (*NOTE NOT PART P)* where periodically approved electricians have to complete their xxth edition in order to work. Gas Safe measures – making this mandatory once established? Possibly different levels
6. It is essential that that competencies are underpinned by appropriate science, engineering and technology and applied to design related to construction, performance and use. This should apply equally to new and existing buildings and with the latter including the assessment of building fabric and use, diagnostics, pathology, prognosis prior to prescribing the appropriate remediation or solution.

Specifics:

Demonstrating compliance must be a collaborative activity. The benefits of these have been highlighted for nuclear safety case rigour for changes to a high-rise building, London Underground toxicity / reaction-to-fire performance of materials (company standard 1-085), and use of the BS-7974 QDR process as presently applied for airport terminal design and other complex buildings.

The Construction Products Directive and corresponding regulations are a good mechanism to enhance cross-industry collaboration more thoroughly between material manufacturers, suppliers & distributors, specifiers and construction firms fitting the materials. The National Building Specification

(NBS) software can also expand to support this process, although it is expensive to sole practitioners and to partnerships.

A slimmed down version (e.g. NBS-lite) could be considered so that all interested parties, irrespective of their financial turnover, have access to a collaborative, quality assured supply chain.

Main contractor quality assurance should be placed into a single depository which becomes to 'go-to' place for company selection during tendering processes. This depository requires full-time staff whose role would be to continually vet construction companies to include performance criteria such as: quality assurance systems, last project performance, whistle-blowing for ethics for companies only talking the talk and not effecting a genuine collaborative culture, end user 'voice', project information hand-over (thereby enforcing Regulation 38) to the next 'person in charge', insurance backed guarantees on installation (thus compelling suitable control and quality of sub-contractors) and reports from third party on-site supervisors, as recommended by Professor John Cole in his report on Edinburgh schools.

Consider end user friendly contracts – like Latham 1994, Egan 1998, PPC 2000. A lot of the answers are already out in the public domain from previous reviews. Collaboration saves money.

Training and Accreditation

A review of fire safety training and accreditation is necessary. A major flaw for carrying out fire risk assessments has already been highlighted. Competence to undertake fire risk assessment needs legal definition.

The single depository for contractors should also capture competent persons so they are present on a quality assured supply chain. Being transparent on sector experience (e.g. airports) is crucial so that 'intelligent customers' understand they are engaging the right expertise.

Q5 Is the current checking and inspection regime adequately backed up through enforcement and sanctions? In particular

- **Where does the regime already adequately drive compliance or ensure remedial action is always taken in a timely manner where needed?**
- **Where does the system fail to do so? Are changes required to address this and what would be the benefits of doing so?**

Summary:

1. Pre-emptive and proactive intervention should be encouraged rather than action after the fact.
2. It is essential there are correct procedures to be followed to prevent complacency in approach. That processes are not driven by cost and time.
3. There should be a mandatory public Register of information of these buildings logging specifications, methods of build and including Health & Safety Risk Assessment/Construction Phase Plan/Fire Risk Assessment/any other certification which is publically available to all – then the users of buildings can easily access (apparently there has been an issue with the request for information) – and any future refurbishment will be informed by existing – mandatory certification on any improvements. In tandem with this, more robust informing and education to building users to ensure that buildings are being used effectively, safely and with the intentions of the design. The Register would also be useful to the Fire Service in determining methods of fighting fires as they would have the information before arriving at the site (whether to fight the fire from inside or outside the building).

Specifics:

The Responsible Person and Fire and Rescue Service Roles

The RR(FS)O is correct to make a single person responsible for a building's fire safety precautions and management. It is often, and correctly, said that ignorance of law is no defence for not following it; however, competency is not demonstrable against regulation. Instead, in practice, competency is substituted for capability – anyone can have a stab at fire risk assessment via the 'five step process' * commonly adopted.

* identify ignition risks, identify who is at risk, evaluate fire control measures, record, review.

This occurs - irrespective of the building size or population at risk - without suitable education, qualification, mentoring, training and experience. This is a flaw and needs correction.

Not all Fire and Rescue Service (F&RS) authorities have the engineering skills within London Fire and Emergency Planning (LFEPA), Greater Manchester F&RS and other major cities/conurbations. Variation in guidance given by fire officers to large design teams and small practitioners is thus a risk. Again, competency is key: a seemingly small recommendation in a complex building (complex, meaning in terms of size, layout complexity and population at risk exposure) might have significant impact on some other construction element or area of the building. The Fire and Rescue Service Act 2004 could be updated to reflect minimum competencies, and to also help standardise guidance/advise given.
'Complex buildings' need legal definition, with a personnel role attached such as the 'intelligent customer'. The right level of discussion can then take place between the 'intelligent customer' and the enforcing authority. Airports have such roles to ensure their terminals remain safe and many high hazard industries have similar personnel. High rise blocks need the same.

Documentation

The single depository for competence will also handle documentation. The 'person in charge' is responsible for remediation. The Internet provides a great opportunity to condense and streamline the various ways documentation is presented – a recognised model for documentation should be produced, with complex building owners augmenting as required to satisfy other legislation for their particular sector.

Tenants' & Residents' Voice in the current system

Q6 Is there an effective means for tenants and other residents to raise concerns about the fire safety of their buildings and to receive feedback? Where might changes be required to ensure tenants'/residents' voices on fire safety can be heard in the future?

Summary:

1. Mechanisms must be introduced to provide tenants, other residents and users the opportunity to complain without fear.
2. A robust Complaints Procedure is necessary
3. Together with a whistle blowing scheme
4. Cognisance of the cross section of the tenants, other residents and users taken into account
   An Ombudsman Service

As noted, model tenancy contracts on the government website can support this process. The proposed single depository for competence could also receive end user concerns and establish a database so that trends are evidentially manifest to inform further regulation. The Internet can help as well to streamline this process, and to make it accessible to everyone.

Quality Assurance and Testing of Materials

Q7 Does the way building components are safety checked, certified and marketed in relation to building regulations requirements need to change? In particular:

- **Where is the system sufficiently robust and reliable in maximising fire safety and, if appropriate**
- **Where specifically do you think there are weaknesses/gaps? What changes would be necessary to address these and what would be the benefits of doing so?**

Summary:

1. Transparent information and warnings should be mandatory
2. More information on composite panels – vigorous testing of components to establish reactions to different fabrics – clearly accessible and available
3. Validate which tests are acceptable
4. A system to protect against fraudulent documentation some products e.g. use of fake CE Marks

Specifics:

The regulatory requirement for non-combustible facades above 18m is a long standing requirement and building designers of the mid-20th century interpreted this with masonry and concrete construction. The advance of technology in plastics has led to a wide range of products with different constitutions and ratios of materials. There is no control or grading system over these for fire safety performance in many cases. One needs to be created, underpinning a robust detail book for Part B as discussed earlier.

There is reasonably close correlation between BS 8414 test results / BR 135 classification and end use application. This contrasts against a BS-476 furnace test against a fire door specimen, or the BR 187 enclosing rectangle method, which both have significant safety margins between the test laboratory and end use application. BR 187 in particular disregards any time-dependency considerations for external fire spread across an elevation – the assumption is that is all on fire. This stretch of credulity also provides a societally acceptable safety margin. We propose that the safety margin between the BS 8414 test results and BR 135 classification is expressly reviewed to verify if it is reasonably equivalent to other safety margins

Differentiation within the current Regulatory System

Q8 What would be the advantages/disadvantages of creating a greater degree of differentiation in the regulatory system between high-rise multi occupancy residential buildings and other less complex types of residential/non-residential buildings? Where specifically do you think further differentiation might assist in ensuring adequate fire safety and what would be the benefits of such changes?

Summary:

1. Would be a big advantage
2. Would be easier to apply proportional approach
3. Differentiation by user group suggested
4. Ensure information targeted at the various users would be more workable
5. Tie in with CDM information work together with HSE to achieve?
6. All issues to be considered holistically – Fire/H&S – e.g. CDM/Means of Escape/Standards.
7. All should be complementary & coherent to those different types of users
8. Easy to understand robust detailing
9. Encourage compliance in a reasonable and proportional way and not impossible to either adhere to or enforce
10. Care not to make any process/scheme overly bureaucratic; it must be proportional

Specifics:
It is remarkable that DCLG issued a circular on the 29th September (update on interim mitigation measures required pending remediation of cladding) stating: "all residents should be surveyed in respect of their ability to evacuate the building without assistance". How? Who? What? spring immediately to mind. This is a huge area for research:

- Consider communication methods to effect the most effective phased evacuation for a wide societal cross-section;
- Validate 'time to move' phase of fire evacuation via real-life studies;
- When does 'stay put' change to 'get out' – and why would the situation remain safe?
- What legal challenge could the Equality Act 2010 give if the solution was to put persons of restricted mobility on lower floors? (Here I believe Hans Kelsen's grundnorms would hold – life safety has power of veto over accessibility – but this is legal philosophy, not practice).

There is a lot to say about the method of evacuation – simultaneous could jam the stair up and people who need to get out are prevented from people lower down the building. Will people push / slip / trip – as occurred during the Parsons Green station incident recently? Evacuation is then virtually impossible. Whilst this risk exists for stair evacuation generally, it is acute for stairs not sized for simultaneous evacuation in buildings where the onset of untenable conditions can happen fairly rapidly.

This interfaces directly with tenant training – responding to a fire alarm. Therefore, the alarm must be reliable and not subject to regular nuisance events.

What role for refuge floors to (a) protect vulnerable persons, (b) limit external fire spread and (c) form a bridgehead for many teams of firefighters, and provide a safe retreat for them?

Do single escape stairs remain acceptable for tall residential buildings?

Consider sprinkler protection based on statistical evidence.
Consider firefighting facilities based on the 'weight of response' from the actual attending brigade – equipment varies a lot throughout the UK. If ADB is made more performance-based, this area is a good one to have it.

International Comparisons and Other Sectors
Q9 What examples exist from outside England of good practice in regulatory systems that aim to ensure fire safety in similar buildings? What aspects should be specifically considered and why?
I think the CIC response covers all, we can refer to??

The main global reference standard is the National Fire Protection Association (NFPA), and this is used in the UK (e.g. for power station design), almost everywhere (for rail station design) and for most buildings in the Middle-East, notably Saudi Arabia. NFPA standards favour sprinklers for many buildings and each standard has a committee. A discussion with the relevant NFPA committees would be useful to help guide re-writes of ADB and the corresponding sections of BS-9999.

Other countries with high-rise – like China, Hong Kong, Japan, India, etc. should have their standards reviewed to see if lessons can be learned. One key lesson is use of refuge floors to allow mobility impaired people to reach safety quicker, to firebreak legacy buildings with single staircases vertically into smaller ones stacked on each other, and to limit the fire damage generally. No fire should be able to bypass a refuge floor. Again, think nuclear safety.

Australia and New Zealand also have strong regulatory frameworks, standards and requirements for professional competencies. In New Zealand, gas is banned in high-rise.

Q10 What examples of good practice from regulatory regimes in other industries/sectors that are dependent on high quality safety environments are there that we could learn from? What key lessons are there for enhancing fire safety?

These have been covered earlier in the response, but please give some thought to the following:

1. Nuclear power stations have circa 15 layers of defence in depth to stop fire affecting the nuclear safety functions.
2. Airports have 7 or 8 layers of defence in depth to prevent fire harming passengers.
3. Railway stations have 5 (or 6 if you include the rolling stock fire precautions) to protect members of the general public when using the network.
4. High rise residential developments, with a societal sleeping risk, have 1 layer of defence: compartmentation.

Is that situation still tenable?

END