



**NFCC**  
National Fire  
Chiefs Council

Consultation: Sprinklers and other fire safety  
measures in high-rise blocks of flats  
Ministry of Housing, Communities and Local Government  
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28 November 2019

To the Ministry of Housing, Communities and Local Government,

Please find attached the National Fire Chiefs Council (NFCC) response to the Approved Document B consultation paper '*Sprinklers and other fire safety measures in high-rise blocks of flats*'.

The NFCC is the professional voice of the UK fire and rescue services and is comprised of a council of UK Chief Fire Officers. This submission was put together by the NFCC's Building Safety Programme Team, with input from the NFCC's Fire Engineering and Technical Standards (FETS) Group, national sprinkler leads through the Protection and Business Safety Committee, and officers from the NFCC Operations Committee.

In the wake of the fire at Grenfell Tower, it is vital that we use this time to examine the shortcomings that contributed to the terrible events of 14 June 2017. We note that the findings from the Grenfell Tower Inquiry's (GTI) Phase one report are now available, including a recommendation to include emergency alert systems in high-rise residential buildings.

Such systems may provide additional tools for Incident Commanders to utilise during a fire. However, it should be recognised that such systems (i.e. not only an alert) have the potential to place more persons at risk if they are not part of a package of measures. Other areas need to be addressed to enable their safe use (such as fire service consultation and training) and NFCC recommend further consultation with FRSs and fire sector experts to plan and enable any roll out of such systems.

Additionally, if these are to be used in existing buildings, we think it is imperative that the approval is subject to the Building Regulations approval process and the fire service are appropriately consulted.

Emergency evacuation cannot justify relaxation of other safety measures. The use of a system should not be used in any way to justify variations from guidance or to be used as mitigation for other building failings and should be consistent across all design guides.

Buildings should never require the use of such a system if designed, built, managed and maintained appropriately. NFCC would therefore caution against introduction of such systems being viewed as 'job done' or creating a false sense of security and reiterate that a stronger

focus needs to be placed on ensuring buildings are safe, and that such a system would never need to be used.

The regulatory environment should also be designed to ensure that over time, it be a legal requirement to consider upgrades within buildings to current standards where fire safety measures are concerned (not simply 'like for like' replacement).

We support lowering the height threshold for sprinklers. NFCC has previously stated that AFSS should be required from 18m in residential buildings, or as defined in any revised ADB in accordance with the outcome of the full technical review. The 18m position relied on an expectation that strengthening would be made to related measures, as part of the full technical review of ADB. However, NFCC understands the intent of this consultation is now to review the trigger height for sprinklers in isolation from these other interrelated aspects of design.

Since the Grenfell Tower fire, the findings of the [Independent Review](#), recent fires, new research, and recent Government policy announcements, NFCC has revised this position. We believe that AFSS should be mandatory in all new residential buildings from 11m (or 4 floors) and above, at a minimum; the rationale for which is laid out in the attached submission.

Recent fires, such as the Bolton Student Accommodation fire on 15 November 2019 highlight that the current failings of the building regulations system are not confined to arbitrary height thresholds. This is a whole built environment issue, and fire and rescue services cannot be expected to fully mitigate fire events beyond the expectations of the building regulations.

We trust the attached submission is helpful and welcome further discussions following the outcome of the consultation.

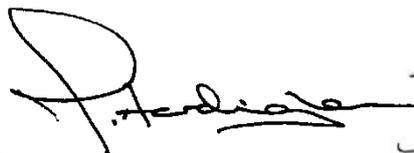
Yours sincerely,

**Roy Wilsher**



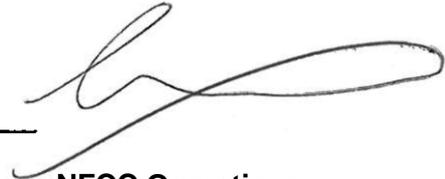
**Chair, National Fire Chiefs Council**

**Mark Hardingham**



**NFCC Protection and Business Safety Committee Chair**

**Chris Lowther**



**NFCC Operations Committee Chair**

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## Trigger Height Options

### Question 1 – Do you agree or disagree that the height threshold for sprinkler provision in new blocks of flats should be reduced? [Agree/Disagree]

Agree. NFCC supports the lowering of the threshold height for the installation of sprinklers in new blocks of flats.

### 1b - If you agree that the height threshold should be reduced, what should the new threshold be and what is the evidence for this particular threshold?

NFCC recommend AFSS be mandatory in all new residential buildings from 11m (or 4 floors) and above, at a minimum.

NFCC supports AFSS as being significantly beneficial in all sleeping risk buildings, including residential buildings regardless of overall building height.

NFCC has previously stated that AFSS should be required from 18m in residential buildings, or as defined in any revised ADB in accordance with the outcome of the full technical review.

Since the Grenfell Tower fire, the findings of the [Independent Review](#), recent fires, new research, and recent Government policy announcements, NFCC has revised this position. We believe that AFSS should be mandatory in all new residential buildings from 11m (or 4 floors) and above, at a minimum.

- Currently there is an anomaly for protection of buildings between 11m and 18m; most front-line equipment carried by services is fit for external firefighting and rescue up to 11m in floor height. This means that in between 11m and 18m, rescue and firefighting operations usually have to be undertaken inside the building, but without a range of firefighting and fire safety requirements (such as dry risers) because these aren't required until 18m.
- Trigger heights within ADB interact (e.g. thresholds for escape stairs, riser mains and firefighter lifts). Together they create a layered system of protection. These require careful consideration of how they interact. For example, the use of sprinklers at some thresholds impacts on other requirements currently in guidance, and can in some circumstances enable design flexibilities.

- The 18m position relied on an expectation that strengthening would be made to related measures, as part of a full consideration of all thresholds and how they interact. NFCC's full response to the March 2019 Call for Evidence on ADB can be found [here](#).
- However, Government now intends (as outlined in the latest ADB [consultation](#)) to review the trigger height for sprinklers in isolation from these other important aspects of design.
- Buildings in scope of the future system will be subject to a safety case regime; NFCC understands the [intention is to introduce](#) the safety case regime for buildings at 18m and above, which will not address the gap for protection between 11m and 18m.
- Attempts in 2019 to clarify ADB should have gone significantly further, and it is our understanding that the full technical review could take up to five years.
- Trigger heights for sprinklers in other parts of the UK are within the context of significantly stronger fire safety requirements that apply in those jurisdictions, for instance in Scotland all new high-rise buildings are required to have two escape stairs, and the combustible cladding ban has been introduced from 11m (instead of 18m as in England).
- Recent fires in buildings lower than 18m have resulted in total building failure. The research and evidence support the view that sprinklers would have extinguished or suppressed these fires in most cases<sup>1</sup>, and where they did not, they would certainly have provided residents and firefighters with additional protection, and significantly mitigated damage<sup>2</sup>.

NFCC recommend AFSS be:

#### *New builds*

- Recommended in all sleeping risk buildings
- Mandatory in all new residential buildings with a storey of 11m (or 4 floors) and above, at a minimum *[This is revised from our position of 18m linked to the full review of ADB, in response to emerging evidence, research, recent fires, and policy announcements as outlined above]*
- Mandatory in all new student accommodation

#### *Existing buildings*

- NFCC supports AFSS as being significantly [beneficial](#) in all existing sleeping risk buildings, including high-rise residential buildings regardless of overall building height.
- Mandatory requirement to retrofit in all high-rise residential buildings over 30m that are served by a single staircase (regardless of future refurbishment)
- Mandatory requirement to retrofit where buildings currently exceed 30m (when these buildings are scheduled to be refurbished)
- Mandatory requirement to retrofit in all residential buildings 11m (or 4 floors) and above on a risk assessed basis. This requirement should be tied in with the proposals for a

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<sup>1</sup> [Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data May 2017](#)

<sup>2</sup> [Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data Incidence of Deaths and Injuries in Sprinklered Buildings: A Supplementary Report March 2019](#)

Safety Case regime whereby persons responsible for buildings have to justify the safety of all building occupants (which would include accounting for vulnerable persons and building deficiencies, such as lack of compartmentation).

Any framework for setting the risk assessment process for retrofitting should seek to avoid the issues experienced with the implementation of BB100, which created loopholes whereby most new schools are still being built without sprinklers. NFCC are clear that this was not the intention when BB100 guidance was developed.

In addition, the demographic of the population of such buildings is likely to be more diverse than in the past, with there being an increased likelihood of older persons and persons with disabilities remaining in their own homes and receiving external care rather than moving out into specific care buildings. Most fire fatalities occur within the home and often involve the most vulnerable in society. The guidance requires reconsideration towards a person-centred approach.

Many requirements in Wales and Scotland now surpass those in England, such as domestic sprinklers in new social housing developments and suppression systems in new homes. Scotland has announced changes to reduce some height related requirements from 18 metres to 11 metres and, where possible, extend mandatory installation of sprinklers in flats, regardless of height, and in larger multi-occupancy dwellings and those which provide care. NFCC would like to see improved consistency of public safety standards across the UK.

Any revision to building regulations should feature balcony coverage as a requirement.

## **Design for sprinkler provision**

**Question 2 – Do you agree or disagree that these systems should be designed in accordance with the relevant guidance in BS 9251? [Agree/Disagree]**

Agree.

**2b - If you disagree, what specifications and performance should be required?**

NFCC agrees with the use of BS 9251. However, we are also aware that following the publication of BS EN 16925, that the UK will be required to adopt this standard in 2020 and that additional work is being carried out by the BSI to revise BS9251 so that it can be used for buildings above 4 storeys.

## **Transitional provisions**

**Question 3– Do you agree or disagree that there should be a transitional period of six months? [Agree/Disagree]**

Disagree.

**3b - If you disagree, how long should the transition period be?**

NFCC would caution that however the implementation is designed, it seeks to avoid the experiences in Wales, where transitional requirements have been significantly 'gamed' through developers submitting applications prior to the end of the transition period.

Although a transitional period may be desirable, those minded to construct buildings with a view to safety should strive to improve the safety of future occupants. From the experiences in Wales this has not always been the case.

## **Wayfinding signage for fire and rescue services**

**Question 4 – Do you agree or disagree that there should be a more consistent approach to wayfinding signage for fire and rescue services in Approved Document B? [Agree/Disagree]**

Agree.

Provision of adequate signage at low level has been identified as an advantage in two Coroner's Rule 43 letters: these were issued by K St J Wiseman (Shirley Towers) and Francis Kirkham CBE (Lakanal House). These reports both recommended additional signage to aid firefighters in identifying areas of the building, particularly at low level, in order to increase visibility in smoke conditions. The Grenfell Tower Inquiry Phase one report has now also recommended that *'in all high-rise buildings floor numbers be clearly marked on each landing within the stairways and in a prominent place in all lobbies in such a way as to be visible both in normal conditions and in low lighting or smoky conditions'*.

The current version of ADB makes no reference to the provision of wayfinding signage for fire and rescue services. Inclusion of guidance for this area including recommendations for the type of purpose groups/occupancies where wayfinding systems should be installed would help to give a consistency of approach.

Wayfinding systems can offer significant advantages for navigating buildings during the firefighting stage of a fire, particularly where this is likely to take place in areas where smoke is likely to obscure high-level lighting luminaires. A uniform application of wayfinding requirements would aid firefighting operations in terms of identifying floor levels and helping to navigate through buildings.

The above-mentioned Rule 43 Letters refer specifically to high-rise residential buildings, but NFCC believes that the considerations of guidance for this area should extend further, into other occupancies, such as sleeping accommodation including hotels and areas (such as basements and basement car parks) where wayfinding can be challenging.

Where wayfinding signage is to be installed in a premises, guidance should include a standardised format for numbering of flats e.g. the first number will always denote the floor number (101,102 etc.) and if the ground, basements or lower ground levels are used these should be denoted with appropriate letters (G, B, LG etc).

The installation of wayfinding systems should not be a substitute for the provisions of an emergency lighting system installed to BS5266-1, but rather as an enhancement to building safety.

The review of the requirements for wayfinding should also consider further signage for Fire and Rescue Services; this should include signage requirements for areas including automatic smoke and heat extract ventilations systems, utilities, and AFSS.

The review should also look to consider other signage that may be useful within the context of the building, such as escape plan signage for use by residents, similar to those found in hotel bedrooms.

**Question 5 – Are there any existing standards or guidance which should be introduced to the guidance provided in Approved Document B? Please specify.**

There are a range of existing British Standards which are applicable to this area:

5266-2:1998 Code of practice for electrical low mounted way guidance systems for emergency use.

BS5266-6:1999 Code of practice for non-electrical low mounted way guidance systems for emergency use – Photoluminescent systems.

BS ISO 16069:2017 Graphical symbols - Safety signs - Safety way guidance systems (SWGS)

ISO 3864-1, Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings

ISO 3864-3, Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs

ISO 3864-4:2011, Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials

ISO 7010:2011, Graphical symbols — Safety colours and safety signs — Registered safety signs

ISO 23601, Safety identification — Escape and evacuation plan signs

These standards give guidance on the performance criteria of such systems.

**5b – Does this guidance need to be supplemented or amended for inclusion in Approved Document B? If yes, please specify how.**

Yes. The standards referred to in Question 5 are significantly out of date and do not ‘reflect’ more modern photoluminescent materials and their properties. If these standards were to be referred to in Approved Document B then they should be reviewed and updated as necessary.

**Question 6 - What views exist on the benefits of each signage option set out above?**

Vinyl lettering - if installed to a standard would have the advantage of aiding the identification of floor levels and flat numbers. However, this may be reliant upon additional lighting in order to see it, particularly if installed at low level without additional powered lighting luminaires, which may be necessary in order to meet the requirements of BS5266-1. There may be additional issues with regard to the maintenance of vinyl lettering and its longevity.

Photo luminescent lettering – this would have the advantage that it would be usable in low light situations and if installed as part of a low-level wayfinding system, could still be used when smoke obscures high-level emergency lighting luminaires. Photo luminescent lettering and wayfinding systems may have additional benefits for highlighting escape routes for persons with visual impairments. However, with the current British Standard, the full benefits of these systems may not be realised. These systems may also require additional lighting to be installed to ensure that the photo luminescent materials received sufficient energy to excite them.

Emergency powered lighting luminaires – emergency lighting luminaires have all the benefits of existing emergency lighting units. However, the use of powered lighting luminaires would

incur additional costs if additional units needed to be installed at low-level in order to achieve the maximum benefits

**6b - What is the preferred option set out above for wayfinding signage? Vinyl lettering, photoluminescent lettering, emergency powered lighting luminaires, other (please specify).**

In order to take account of the effects of smoke obscuration, a combination of powered luminaires and photoluminescent lettering is likely to be the most reliable option to ensure there would be a benefit to firefighters.

Any mandate for wayfinding signage should be provided within minimum criteria. These criteria could be any of the options, but with a requirement for a minimum low-level visibility. At present this would involve emergency powered lighting luminaires highlighting vinyl lettering or photoluminescence.

The revision to the British Standard may enable some design flexibilities, such as the use of photoluminescence on its own. This could provide a lower cost solution for retrofitting, but because the standard is 20 years out of date, there needs to be work carried out in order to validate the effectiveness of photoluminescent material to ensure that it achieves similar standards to those of powered lighting systems at all times. Any system should be capable of being clearly seen after a period of 60 minutes. See BS ISO 16069 for further details; a competent person should be consulted during the design process for any proposed installation.

## **Evacuation Alert Systems**

**Question 7 – Should Approved Document B include a requirement for an emergency evacuation system, which could support fire and rescue services operational response by alerting residents if they need to evacuate? [Yes/No]**

Yes. NFCC would support the inclusion of a requirement for emergency evacuation systems in Approved Document B but note that further consultation with FRSs should be undertaken to assist with operational planning and implementation.

Emergency evacuation systems may provide additional tools for Incident Commanders to utilise during a fire. However, it should be recognised that such systems (i.e. not only an alert) have the potential to place more persons at risk if they are not part of a package of measures. Other areas need to be addressed to enable their safe use (such as fire service consultation and training).

Buildings should never require the use of such a system if designed, built, managed and maintained appropriately. NFCC would therefore caution against introduction of such systems being viewed as 'job done' or creating a false sense of security. A stronger focus needs to be placed on ensuring buildings are safe, and that such a system would never need to be used.

Any proposal for these systems to be accepted within design guidance such as ADB must take care not to create a false sense of security, or lessen overall safety standards of any design. FRSs should not be viewed as a safety net for failures in the built environment or as a measure to compensate for poor design, build or maintenance.

To that end, the regulatory environment should be designed to ensure that over time, buildings are upgraded to current safety standards as nearly as is reasonably practicable. NFCC believe that provisions should be introduced into law to:

- Require that refurbishments and changes of use (for all buildings) should trigger a requirement to comply with current fire safety standards as nearly as is reasonably practicable, as is the case in other similar jurisdictions.
- Provide powers for FRSs to seek improvements in FRS access and facilities throughout the life of a building.

The establishment of such a system, and its application in an emergency situation, should be considered as part of the work recently commissioned by Government to review the means by which the building strategy has to change from stay put to simultaneous evacuation in a serious fire scenario.

## **7b – For each response, what views exist on the benefits and risks of such an approach?**

### **Benefits**

The availability of an alert system may provide Incident Commanders another tool which can be used instead of, or alongside, traditional methods of alerting residents including door knocking and instruction from control staff to encourage occupants to leave their dwellings. This could allow a more effective way of instantly directing (after an assessment by operational crews) residents to evacuate rather than staying in their dwellings.

Depending on how such systems are designed, possible benefits that have been identified to having a system include the ability to communicate with residents about other types of incidents, such as HAZMAT or terrorist incidents. These would rely on systems having voice interaction and the ability to provide bespoke messages over microphone from an Incident Commander

However, there are a number of risks which need to be recognised to enable safe use and implementation, as outlined below.

### **Risks**

NFCC considers there to be a range of risks associated with introduction of such systems without appropriate planning, in particular where they may be retrofitted into existing buildings. Some of these were covered in our original response to the Call for Evidence on Approved Document B in March 2019<sup>3</sup>.

NFCC notes these systems are intended for use exclusively by fire and rescue services, but that this consultation question is open for full public response. Such systems will come with significant FRS training requirements, and may place new burdens on FRSs. NFCC recommend further consultation with FRSs and fire sector experts to enable any roll out of such systems.

### **Research and behaviour**

The standard provides an alert – not a guarantee of evacuation. The enabling British Standard (BS 8629) provides a method to alert occupants, but the decision to evacuate or not still ultimately remains with the occupant. Sounding an alert does not guarantee people will immediately react and evacuate, as is frequently evidenced with responses to fire alarms.

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<sup>3</sup> [https://www.nationalfirechiefs.org.uk/write/MediaUploads/Grenfell/Technical\\_review\\_of\\_ADB\\_-\\_1\\_March\\_2019\\_-\\_FINAL.pdf](https://www.nationalfirechiefs.org.uk/write/MediaUploads/Grenfell/Technical_review_of_ADB_-_1_March_2019_-_FINAL.pdf)

Careful consideration needs to be given to the type of alert and educating the public and residents on these safety systems.

As set out previously, NFCC has written to Government requesting funded research into emergency evacuations of high-rise buildings, which fail to such an extent that residents can no longer 'stay put' (where it is part of the design strategy).

These systems will be installed in buildings which are not originally designed to facilitate simultaneous evacuation and the research should consider how facilities in existing buildings (for example ventilation systems not designed for such a scenario) support the change of approach. This research should also consider factors such as:

- People's individual circumstances, such as disabilities and mobility.
- How to communicate the change in strategy to all residents.
- The impact of evacuation on firefighters' ability to tackle a fire and deal with rescues in the immediate vicinity of the fire, and whether equipment, smoke and heat within the building could lead to injuries as people try to vacate the building.
- The effect of Incident Commanders using these systems in different configurations and any additional risk this places on occupants.
- How many firefighters or other first responders are needed to deal with a comprehensive high-rise evacuation. This is highly relevant as resourcing levels for Fire and Rescue Services have reduced considerably and differ across the country.
- The design features of the building, such as the number of staircases.

Additionally, there are a range of assumptions about peoples' behaviour in a fire that would benefit from further research. For instance:

- Pre-movement times for residential buildings can be long and unpredictable:
  - Would the system require a voice alarm to be effective? If so, is English language sufficient?
  - What systems are most effective for the hearing impaired?
  - What are the implications of people who refuse instructions to evacuate?
- Would such a system lead to a false sense of security, that the FRS can act as a safety net for failures in the built environment?
- Consideration is needed into how such systems should be tested, and if there would be a need for regular drills of residential buildings.

## **Building management and responsibility**

BS 8629 should be considered as part of a package. Other measures are likely to be required to support an Incident Commander being able to use such a system, including a detailed management plan with information given to residents so that they know the purpose of the system and the actions required of them if it is used.

Any system that changes the building evacuation strategy to a simultaneous evacuation should be accompanied by sufficient management planning and procedures to facilitate a safe evacuation.

Installation of such a system does not change the level of risk in a building, and FRSs cannot be expected to fully mitigate fire events beyond the expectations of the building regulations.

FRS are resourced with the expectation that a residential high-rise fire will generally be contained to a single flat, and there should be no, or limited, reliance on external rescue. This expectation is underlined by building regulations guidance, which requires a high degree of compartmentation, and external walls that must adequately resist the spread of fire. Therefore,

NFCC would caution against introduction of such systems being viewed as 'job done' or creating a false sense of security. A stronger focus needs to be placed on ensuring buildings are safe, and that such a system would never need to be used. To that end, the regulatory environment should be designed to ensure that, over time, buildings are upgraded to current safety standards.

## **Consultation and the Installation of Evacuation Systems**

Fire and Rescue Services must be consulted to ensure they agree with the package of measures proposed, and to ensure they have appropriate understanding of the system installed. While this is included within BS8629, in the current regulatory environment we know people frequently fail to consult the FRS.

NFCC is writing to the Ministry of Housing, Communities and Local Government to ask that the Ministry write to all building control teams and local authorities across England, to ensure any consultations on fitting emergency evacuations alarms are referred to FRSs at the earliest opportunity prior to the building control process.

## **Use of Evacuation Systems by Operational Firefighters**

Significant training is required. While introduction of such systems will provide Incident Commanders with an additional tool at their disposal, a number of factors need to be planned for to enable their safe introduction.

Safe use relies upon a good knowledge of rapidly changing conditions within a building. The stairwell is one of the most vulnerable and critical parts of the building to be which can be affected by heat and smoke during firefighting operations. Additionally, once firefighting has commenced the evacuation may impede operations, and firefighting operations may increase the potential for slips, trips and falls for escaping occupants.

Even with the extensive training FRS will be responsible for providing, it must be understood that scenarios where the emergency evacuation system might be used may pose additional risks to occupants. The Incident Commander will be expected to make an informed decision about when and where to use the system. There may be situations whereby that decision making is based on weighing the risk of occupants being asked to escape through conditions which endanger their lives, against the fundamentally worse option of being immediately, or reasonably foreseeably soon, at risk from fire, heat and smoke if they remain in situ.

Whilst operational use is not within the scope of a technical standard, there are subsequent references throughout towards possible actions that could be carried out by the FRS. At present there is no operational guidance for use of these systems and it seems that, for their safe use, the standard places a significant responsibility on operational decision making.

These decisions may be required in situations where there is no way of knowing or being able to monitor the conditions in the stairs and escape routes, both at the current time and also through the period, sometimes extended, in which the evacuation takes place. It is possible decisions could be taken to deploy additional resources to monitor conditions in the escape routes and manage the evacuation. As such, a decision to use it may have implications for the level of resource needed at an incident. For example:

- It is likely the corridor/stairs will require an initial assessment to ensure the routes are tenable and that the use of the system is not directing residents into a more unsafe situation.
- The corridors/stairs may require continual monitoring to ensure the conditions do not deteriorate such that where originally tenable conditions now become untenable –

which can happen very quickly, and may well be caused by the actions of those evacuating.

Training packages will need to be developed to address a range of factors, for instance:

- When does an Incident Commander use it – immediately, thus delaying firefighting operations; or later when conditions may have deteriorated?
- If used early, and linking to the unpredictable nature of residential evacuation, when does the IC determine the evacuation is sufficiently complete?
- Will this lead to greater fire damage, and potentially injury to residents directly affected by the fire, due to crews not immediately attacking a fire, or doing so with less resource that might otherwise be the case?

Further consideration to enable implementation should be carried out on the impact, implications and training requirements for fire and rescue services to enable the introduction of such systems.

## **Approvals**

Design and approval need to be suitably assessed. Including guidance on these systems in ADB means that they can be installed in both new and existing buildings, and the installation in all tall residential buildings was a recommendation from Phase 1 of the Grenfell Tower Inquiry (GTI). If these are to be used in existing buildings, we think it is imperative that the approval is subject to the Building Regulations approval process and the fire service are appropriately consulted.

## **Supporting design considerations**

Limited supporting provisions can be provided for existing buildings. There are several measures which further reduce the risk to occupants when using an emergency evacuation system such as those called up in the Scottish Technical Handbook (multiple escape routes, AFSS) and other measures such as evacuation lifts and disabled refuges.

Some of these will be impracticable to incorporate into existing buildings in conjunction with the potential alert given by as BS 8629 system. However, we recommend these are considered for tall new build residential designs.

Any guidance within ADB about installing such systems should give due consideration to the broader fire safety design features of the building, which will have implications for their use by operational firefighters.

A range of additional measures could be considered for inclusion within ADB which would bring English building safety standards closer to those of other world leading countries. A range of measures could be included to ensure that buildings are designed, built and maintained in such a way that would help support the safe use of evacuation systems. These could include, but are not limited to:

- Suppression – use of sprinklers could support the safe use of evacuation systems
- Disabled evacuation lifts and refuges
- Voice interaction (ability to provide bespoke messages from a microphone)
- Ventilation – an automatic and robust ventilation strategy
- Multiple stairs – the system cannot direct building occupants into the only (single stair) in the building. Having two staircases can significantly enhance the complementary nature of evacuation strategies and firefighting operations.

Many other countries have requirements for multiple staircases. The government should consider this and the available evidence from other jurisdictions. The increased use of social

media means that people are more likely to become aware of fires in their buildings than previously was the case. This is changing the behaviour of high-rise building occupants and has the potential to increase the number of people attempting to use the staircase. Options for change in addition to multiple stairs could include:

- set thresholds, or a requirement that fundamental consideration must be given to the number of staircases once set thresholds are reached (e.g. buildings over 50m).
- minimum staircase widths
- firefighting provisions around shafts and lobbies
- stricter requirements for travel distances.

It should be remembered that the stair is potentially at its most vulnerable during firefighting; this is when firefighting may necessitate doors being held open to facilitate firefighting hose. The stairs have to be sufficiently separated by both compartmentation and distance to ensure that they are not both/all compromised by the same fire.

What cannot be lost is the original premise that compartments should be able to survive burn out. Emergency evacuation cannot justify other issues. The use of a system should not be used in any way to justify variations from guidance or to be used as mitigation for other building failings and should be consistent across all design guides.

### **Vulnerable Persons**

Consideration should be given to how best to manage such systems in buildings where vulnerable persons are housed who cannot self-evacuate.

Any relevant standards should require building owners to consider the needs of occupants by including a person-centred risk assessment to account for the possibility of an evacuation system being activated.

It should be recognised that short-term issues will still impact on peoples' ability to evacuate, such as (e.g. broken legs, late stage pregnancy, elderly visitors, short term holiday lets, or impairment through alcohol or drugs). In this regard, further consideration should be given to the use of evacuation lifts for persons with disabilities and refuge areas. The inclusion of evacuation alert systems into ADB should also come with guidance for responsible persons to assess the adequacy of their buildings in terms of evacuation facilities and the requirement to improve these to a minimum standard (e.g. upgrading lifts to meet a minimum evacuation standard).

### **Question 8 – If this requirement was introduced to Approved Document B, above what height threshold should this system be required?**

If a height threshold is required, we recommend the threshold should be 11m similar to our response to question 1b. However, a binary height threshold may not be the best approach.

### **8b – For each response, please provide evidence to support your answer.**

There may be cases where due to the safety features and building layout, there would be limited additional benefit in the emergency escape system at 11m. Similarly, there may be cases where there might be benefit in installing a system in a building below 11m (such as where there are vulnerable residents with extended escape distances). While a height threshold may be the simplest way to implement this requirement, there would be benefit in allowing some assessment of risk to inform the installation of these systems.

Further consideration could also be given to requirements in the Scottish Technical Handbook, where the threshold for the installation of these systems is closely connected to the requirements for sprinklers and two staircases in buildings above the threshold height.

## Assessment of Impacts

**Question 9 – Please provide any additional evidence on costs, risks and benefits which should be considered in an assessment of impacts in the following areas.**

**a) Sprinkler provision in new high-rise blocks of flats**

**b) Wayfinding signage for fire and rescue services**

**c) Evacuation alert systems**

**Sprinklers – NFCC and NFSN research**

In 2017 the NFCC and the National Fire Sprinkler Network jointly published the report '*Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data*'.

The report was based on an analysis of fires recorded in all United Kingdom fire and rescue services between 2011-2016, where sprinklers were recorded as being present. Five years of data on fires in premises with sprinklers was collected from 47 fire and rescue services across the UK. A further three services covering island areas confirmed that they did not attend any fires with sprinkler systems.

The report presented the following headline results:

- The cases analysed amounted to 2,294 incidents of which 1,725 (75%) were in non-residential buildings and 414 (18%) in dwellings
- sprinkler systems operate on 94% of occasions, demonstrating very high reliability
- when they operate, they extinguish or contain the fire on 99% of occasions
- in both converted and purpose-built flats sprinklers were 100% effective in controlling fires

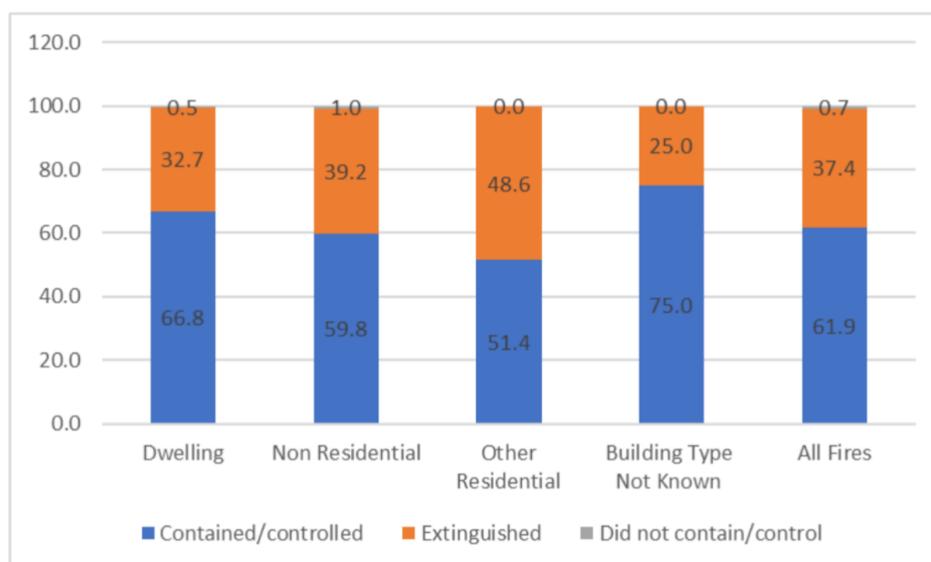
In 2019 further research was conducted into the performance of sprinkler systems in protecting life and reducing the incidence of harm. Key findings across the reports found:

- there was not a single fatality in a building (other than a dwelling) where sprinklers were fitted and could be expected to work
- whether in a dwelling or other type of building, if sprinklers are fitted you are half as likely to be harmed by a fire
- if you were injured then the chances of going to hospital were reduced by 22%.

The full 2017 report can be read [here](#) and the follow up 2019 report can be read [here](#).

The impact of sprinkler systems in controlling or extinguishing fires is shown in Figure 8 below from the 2017 analysis. Data available from 677 fires, showed sprinklers contained or controlled the fires in 62% of incidents and extinguished the fire in a further 37% of incidents. Hence, the performance effectiveness of sprinkler systems was 99% across all building types.

**Figure 8: Impact on Fires where System Operated by Building Type, %**



Source: Optimal Economics

The [submission](#) from the European Fire Sprinkler Network in December 2017 in response to the *London Assembly Planning Review for Installing Sprinklers in London's Buildings*, indicated the average cost of installing sprinklers ranged from £1,200 - £2,000 in new flats and from £1,500 - £2,500 in existing flats.

[Safer High-rise Living – Callow Mount retrofit project](#) (BAFSA, 2012):

where a 13-storey tower block was retrofitted at an average cost per flat was £1,150 (at 2012 prices). Following the publication of this report, there have been many examples of successful retro-fitting of sprinklers into high-rise residential buildings across the country.

[Studley Green Experience: Ten years on](#) – FRM Journal, March 2009. This report details the success of the UK's first large scale fitting of sprinklers in social housing.

A library of short case studies on successful sprinkler activations is available on the [NFSN website](#).

**Question 10 - Are you aware of any particular equalities impacts for these proposals? How could any adverse impact be reduced and are there any ways we could better advance equality of opportunity or foster good relations between people who share a protected characteristic and those who do not? Please provide evidence to support your response.**

Most fire fatalities occur within the home and often involve the most vulnerable in society. Careful consideration is needed about how best to support means of escape not just for disabled people, but for vulnerable people more broadly. The guidance requires reconsideration towards a person-centred approach.

Research has found buildings are likely to be frequented by an increasing proportion of persons with reduced mobility<sup>4</sup>, and design guidance related to egress and safe evacuation in

<sup>4</sup> Boyce, K., *Safe evacuation for all - Fact or Fantasy? Past experiences, current understanding and future challenges*, Fire Safety Journal (2017)

the main has its origins in outdated studies conducted with populations who were able-bodied and fit.

Consideration should be given to how ADB can better protect vulnerable residents in the future and meet the needs of an aging population. The expectation that large proportions of the population can descend staircases, particularly in tall buildings, is increasingly unrealistic due to shifting trends such as:

- a desire for more support to be provided at home rather than in a residential care setting
- rising levels of obesity
- mental health challenges within communities
- The increased use of short term lets for holiday rentals can significantly change the demographic of a block.

FRSs are aware of new builds designed as purpose-built blocks of general needs flats, being marketed and filled with people receiving care. Other ambiguities are also evident across the market, such as retirement homes which include supported living. In Scotland, there has been experience of people buying care homes and then licensing them as HMOs.

In addition, the way in which people live in and use buildings has evolved. Greater reliance on technologies is an integral part of our lives. The pace and change of technology has changed the materials we use to construct buildings and a demand for more environmentally sustainable and energy efficient buildings. Assumptions within ADB may no longer be fit for purpose, in the context of increased modern fire loadings in typical households, potential hoarding issues and increasing vulnerabilities within the population. Further research may be warranted to establish if hoarding is an increasing problem, based on the experience of fire services, and to clarify if normal use in modern society represents an increased hazard compared to previous occupation.

Any amendments to ADB should be mindful of wider trends such as these and the ability for the regulatory environment to respond. The Regulatory Reform (Fire Safety) Order 2005 which enables FRSs to regulate these buildings was designed on the assumption that buildings are built correctly to begin with. The FSO is inadequate to deal with these trends, which will continue to increase as the population ages. Potentially vulnerable consumers who choose to live in buildings marketed for the purpose of providing care should reasonably expect to be provided with a higher level of safety than a general needs building.

Evacuation strategies and plans should consider the needs of disabled and vulnerable people. Requiring standards which ensure fires remain confined to the room or flat where they start not only protects the lives of residents and firefighters in those buildings, but has in-built benefits to protecting property, the environment and communities.

Appropriate construction, management and maintenance of buildings is clearly critical in this context, and in this regard NFCC would stress that implementing holistic changes to the whole system in line with the recommendations from Dame Judith Hackitt is vital.

In addition to considering how to ensure fire spread is inhibited, and issues covered elsewhere in this submission, consideration should be given to other measures which would provide additional layers of protection such as:

- appropriate height thresholds
- additional use of evacuation lifts
- the more widespread use of critical life safety systems such as automatic water suppression.

- Increased provisions for refuge areas, and potentially use of refuge floors (that can provide up to four hours of protection) as seen in other countries should be considered
- appropriate means of escape (for e.g. not creating expectations that elderly, disabled or less mobile persons can use escape windows).

NFCC would also support a review of the assumptions in 0.6 of ADB, and inclusion of reinforcement of the requirement to maintain buildings adequately. This could include reference back to the provisions of the FSO that if buildings are not adequately maintained over time owners and responsible persons could be subject to making improvements.