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Report of the FSMC Automatic Fire Suppression Systems Working Group

Purpose of report

For information.

Summary

This paper contains the report of a working group set up by the Commission at its October

Recommendations

Members are asked to note the report

Actions

Officers will submit the report to the LGA and Leadership Board to seek approval of the recommendations as the LGA's position and for a joint statement in line with that position to be agreed with NFCC

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Background

1. At the October 2017 Fire Commission members asked that a new working group looking at sprinklers and automatic fire suppression systems (AFSS) was set up to consider the evidence for sprinklers and AFSS.
2. The group held a meeting in February to discuss the terms of reference for the group. An evidence session was held at the beginning of May and a meeting to discuss the findings and recommendations was held towards the end of May.
3. The FSMC subsequently fed back on a draft of the report and the working group has now approved this revised version.
4. This paper outlines the current regulations on AFSS, summarises the evidence heard by the group and sets out a number of recommendations.
5. This report refers to AFSS Systems rather than to sprinklers (except where discussing evidence that related specifically to sprinklers). The evidence the working group received suggested that the quality of AFSS other than sprinklers is variable and that some systems are not appropriate for residential properties. However it was decided that the report and its recommendations should refer to AFSS and leave the choice of system to be decided by those with responsibility for ensuring systems are effective. This approach allows for flexibility over time as technology develops. Nevertheless the likelihood is that in the near future AFSS in residential properties will mean sprinklers or misting systems. Where references are made to existing evidence and past performance the term sprinklers is used where that term was used in the original evidence.

Terms of Reference for the Working Group

6. The new working group was asked to answer the following questions in their terms of reference:
 - 6.1. Whether the height of residential high rise buildings in which fire suppression systems should be installed should be lowered to 18 metres to bring the provision in England in line with Scotland;
 - 6.2. Whether considerations about the vulnerability of the residents should also be a factor irrespective of the height of the building and care homes, supported housing, schools and other similar buildings should be required to have fire suppression systems.

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- 6.3. Whether the requirement to install fire suppression systems should be extended to all new domestic residences as in Wales.
- 6.4. To what extent there should be retrospective installation of fire suppression systems in buildings, and if there should be, to what timescale and who would pay.
- 6.5. Should fire safety measures in building regulations be made retrospective?
7. The group was also asked to identify how best the LGA should lobby for changes in the building regulations by considering:
 - 7.1. Whether to refresh the 'sprinklers toolkit' so FRAs can generate grassroots pressure to change the building regulations.
 - 7.2. Whether the LGA should focus at lobbying at a national level to utilise public and media interest in fire suppression systems after the Grenfell Tower fire.
 - 7.3. Where there are any other avenues the LGA could consider, and how these and any other options might be combined together into a campaign.
8. To inform their work in answering these questions the group heard from:
 - 8.1. Fire Protection Association
 - 8.2. Sir Ken Knight of the Independent Expert Advisory Panel
 - 8.3. Greater London Assembly
 - 8.4. Residential Sprinklers Association
 - 8.5. European Fire Sprinklers Network
 - 8.6. Business Sprinklers Alliance
 - 8.7. National Fire Chiefs Council
 - 8.8. Local Authority Building Control
 - 8.9. Ealing Council
 - 8.10. Croydon Council
 - 8.11. Welsh Government

Current situation on sprinklers and AFSS in building regulations in England, Scotland and Wales

9. The requirements on installing AFSS in new buildings vary between England, Scotland and Wales.
10. In England Approved Document B volume 2, which provides guidance on meeting the fire safety provisions in the building regulations, sets out the broad requirements on AFSS in non-domestic buildings. AFSS have to be installed in new high rise blocks of flats over 30 metres in height and in warehouses with more than 20,000 square metres of floor space. Since 2007 the Department of Education guidance in Building Bulletin 100 has required the installation of sprinkler systems in new schools unless the school can demonstrate it is a low risk and installing sprinklers would not provide value for money.
11. Building regulations are a devolved responsibility in Wales. The Domestic Fire Safety (Wales) Regulations 2011 came into effect at the start of 2016, and amended Approved Document B volumes 1 and 2 in Wales. As a result of the regulations any newly built domestic properties or buildings converted into domestic properties must be fitted with AFSS. Typically this means a sprinkler system but the revisions to Approved Document B in Wales would allow the use of other suppression systems like water mist systems. The common parts of blocks of flats are not included.
12. As in Wales building regulations are a devolved responsibility in Scotland. The Scottish Technical Handbook for non-domestic buildings (the equivalent of Approved Document B) requires sprinklers to be installed in new care homes, new sheltered accommodation, new schools and new school buildings in existing schools, and new high rise residential buildings (defined as having a storey over 18 metres in height). In July 2018 a review of building safety standards in Scotland was published (<https://www.gov.scot/Resource/0053/00537771.pdf>) recommending that the requirement for AFSS should be extended to cover HMOs used as care homes and HMOs with more than 10 residents and in flats where this could be done reasonably simply but not individual dwellings. It also effectively reduced the definition of high rise from 18m to 11m. These measures are currently being consulted upon.¹

Previous LGA work on Sprinklers

13. In December 2011 following a presentation from Ann Jones AM about the sprinklers-related legislation in Wales, the Fire Commission established a working group to develop a campaign to press for changes to the regulations around sprinklers, with the objective of protecting the most vulnerable groups of people in society. The focus for the working group was therefore on the installation of sprinkler systems in buildings where older people, children and young people and the infirm either reside in or visit regularly. These were identified principally as schools, care homes, hospitals and homes of multiple occupation (HMOs), as well as high rise social housing blocks.

¹ <https://www.gov.scot/Publications/2018/07/2963/355769>

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14. The working group included Cllrs Edwards and Knox and was supported by the Chief Fire Officers Association (as it then was). It recommended the LGA assist Fire and Rescue Authorities (FRAs) in building local grass roots campaigns to push for wider use of sprinklers by publishing an online toolkit to bring together all the tools and information needed for FRAs in one place, so it could be easily updated. The toolkit was launched at the March 2013 Fire Conference.

Research on AFSS

15. There have been a number of organisations that have published position statements and research into sprinklers and AFSS.

16. The Greater London Assembly planning committee undertook research on the introduction of AFSS, the recommendations of the report are included in **Appendix A**

17. In 2012 BRE conducted a cost benefit study of sprinklers for the Chief Fire Officers Association (CFOA) which concluded that there was a cost benefit case for sprinklers in most purpose built flats, residential care homes and some HMOs.²

18. The following year CFOA published The Business Case for Sprinklers which argued that: where a sprinkler system has been installed:

17.1. Fire deaths (including firefighter deaths) have been almost eliminated

17.2. Fire injuries are reduced by 80%

17.3. Property damage is reduced by over 80%

17.4. There is a reduction in the environmental impact of fire and the economic cost of fire.³

19. The NFCC's sprinklers position statement is attached at **Appendix B**.

19.1. NFCC research indicates that sprinkler systems operate on 94% of occasions and when they do operate they extinguish or contain the fire on 99% of occasions.

19.2. The NFCC support the concept of risk assessed retro fitting of sprinklers in existing buildings.

² <http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwjUu-P8s8TbAhVFasAKHWhZDdQQFjACegQIARA3&url=http%3A%2F%2Fwww.cfoa.org.uk%2Fdownload%2F22311&usg=AOvVaw3IGpNUcn8VJ2wRshGV5hSB>

³ <http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwjUu-P8s8TbAhVFasAKHWhZDdQQFjABegQIARAx&url=http%3A%2F%2Fwww.cfoa.org.uk%2Fdownload%2F38472&usg=AOvVaw34qRj72cqUJrZONByGe8zi>

Grenfell and Hackitt

20. In the wake of the Grenfell fire a number of councils have undertaken work to retrospectively fit sprinklers. For example Croydon Council have been fitting sprinklers in Croydon's tallest council-owned tower blocks. 25 blocks at 10, 11 or 12 storeys, and an eight-storey sheltered accommodation block will have sprinklers fitted.⁴
21. Subsequently Dame Judith Hackitt's report has made a number of relevant recommendations (the report came out on 17 May after the evidence session discussed below and to soon before the subsequent working group meeting to be considered in detail there):
- 21.1. A new regulatory framework should apply to residential properties which are 10 or more storeys high - higher risk residential buildings (HRRBs). (Government could expand the definition to cover other high-rise buildings below 10 storeys or other residential buildings where vulnerable people sleep as next steps). A new regulator - the Joint Competent Authority (JCA) – should be set up. It should bring together council building control functions, fire and rescue services and the Health and Safety Executive, working together to maximise the focus on building safety within HRRBs across their entire life cycle. The JCA's work would be funded on a full cost recovery basis.
- 21.2. Councils would notify the regulator of new HRRBs, and a list of existing HRRBs would be created in the same way MHCLG has been logging private high rise residential buildings.
- 21.3. HRRBs should be treated as a single entity (as opposed to the current confused division of responsibility between the fire Safety Order and the Housing Act) here must be a clear duty holder (either the building owner or superior landlord) with responsibility for the safety of all parts of the building.
- 21.4. HRRB duty holders must take such safety precautions as may reasonably be required to ensure building safety risk is reduced so far as is reasonably practicable;
- 21.5. The duty holder for a HRRB should proactively demonstrate to the JCA through a safety case at regular intervals (every 5 years but more frequently dependent on the level of risk) that they are discharging their responsibilities.
- 21.6. The safety case must identify the hazards and risks, describe how risks are controlled, and describe the safety management system in place.

⁴ <https://www.croydon.gov.uk/housing/firesafety>; see also <https://www.bbc.co.uk/news/uk-england-manchester-42339927>

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- 21.7. A HRRB duty holder will have to demonstrate a fire risk assessment for the whole building has been undertaken by someone with relevant skills, knowledge and experience and reviewed regularly, and ensure any recommendations/requirements outlined in the fire risk assessment are undertaken and completed in a timely manner. Fire risk assessments should be reviewed at least annually until a first safety case review has been completed.
- 21.8. Residents of HRRBs should have clear obligations to maintain the safety of flats and to cooperate with the duty holder (or building safety manager) to the extent necessary to enable them to fulfil their duties. The duty holder should educate, influence and inspect to ensure residents meet these obligations and the JCA should be able to intervene where there is any immediate risks to persons.
- 21.9. The regulator would have a suite of powers to ensure new buildings are safe.
- 21.10. In addition there are proposals for reform of the Approved Documents that provide guidance around buildings regulations.
22. The LGA supports these recommendations in general terms, whilst recognising that there is still much detailed work to be done and expressing some reservations. In particular the LGA has expressed concern that:
- 22.1. The definition of higher risk residential buildings (HRRBs) needs to expand to cover all residential buildings over 18m *and* other residential buildings where vulnerable people sleep. Hackitt says the Government could do this as next steps.
- 22.2. The report envisages industry ownership of guidance around building regulations. Given the role the industry has played to date, the LGA is concerned at this proposal.
23. The Government has asked stakeholders to contact it with views on how these recommendations should be taken forward.
24. Re-writing the building regulations offers an opportunity to change requirements around the provision of AFSS.
25. It remains to be seen how the detail of Hackitt's proposals for a new regulator and the obligation at paragraph 21.5 will develop, but it seems unlikely that they will include specific requirements (e.g. to retrofit sprinklers) and that the retrofitting of AFSS will be one of a series of measures that duty-holder may need to employ to meet their obligations. The LGA could of course lobby for a different approach and/or to ensure that whatever requirements are placed on duty holders apply to buildings over a certain height and those in which vulnerable people sleep.

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Evidence sessions

26. The evidence the Group received emphasised that it was important to understand what AFSS are for and what they do:

26.1. In all cases the role of AFSS is to reduce the spread of fire and thereby reduce the damage and the risk to people elsewhere in the building

26.2. It was argued that sprinklers do not protect the occupant of a room from a fire, because smoke is usually what kills in a fire but it is heat that activates a sprinkler and by the time that happens anyone in the room is probably dead. However, there is international research that proves this is not the case. In 2004 the Building Research Establishment (BRE) undertook several experiments comparing fires in sprinklered and unsprinklered buildings. In all cases it discovered that survivability in all areas (including the room of origin) that you had a greater chance of surviving a fire that was controlled by a sprinkler system.⁵

26.3. Sprinklers in schools are there to protect property by reducing damage. However, they also protect the school as a community asset together with the school course work for those studying for GCSEs and other exams. This work must be redone if lost in a fire, putting pupils under further pressure and likely affecting their results and career aspirations. The impact of taking children out of school for several months and transferring them to new schools, creating larger class sizes, is likely to further exacerbate this negative impact.

26.4. There is therefore a case for their use in high rise buildings where they can put out a fire in the flat in which it originates. Nevertheless it is important to remember that historically there have been more fire deaths in bungalows than high rise buildings because the occupants of bungalows are more vulnerable

26.5. Sprinklers have enviable statistics on fire safety and saving lives. Their track record in this country is 94% reliability and 99% for life safety.

26.6. Sprinklers are effective – they do not as a rule cause significant damage through false alarms. The vast majority of fires are managed by up to four sprinkler heads. 65% of fires are controlled by one sprinkler head activating and a further 20% by two.

⁵ https://www.bre.co.uk/filelibrary/pdf/rpts/partb/sprinkler_section5.pdf,
Effectiveness of Sprinklers in Residential Premises.

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26.7. There is also a strong argument for reducing the height above which sprinklers are required on grounds of firefighter safety such as the fires in Stevenage and Southampton, both of which cost the lives of two firefighters.

27. Witnesses generally agreed that fire safety needs to be considered in a holistic manner and a proportionate risk-based approach taken:

27.1. AFSS are proven as the most effective safety feature; however, they are not a substitute for fixing flaws in primary safety features of a building. AFSS only add another layer of safety to a building.

27.2. Fire doors are essential in protecting high rise residents, hard wired smoke alarms are also important (11% of homes do not have smoke alarms but fires in homes without smoke alarms account for 36% of fire deaths)

27.3. . Spending money on sprinklers *instead* of these elements contravenes the need for a holistic approach to fire safety.

27.4. A typical AFSS will not be able to fight a fire in the structure of the building – such as in the walls or vent ducts. There have, however, been instances involving fires from internal services or even from external sources to a building where sprinklers have been highly effective. An example is a fire at Studley Green where an external fire was controlled by a sprinkler in a kitchen. A recent high-rise fire in a Walthamstow Tower block started on an external balcony and was controlled by the sprinkler system inside the flat.

27.5. It was pointed out that two people died this year in sprinkler fitted properties. However, it is important to note that, in these examples, the two fatalities occurred because their clothing was the main contributor to the fire and they died of the burns inflicted. AFSS are not specifically designed to save life in these circumstances as they require significant heat to activate.

27.6. Some felt that a well-designed building should not need AFSS and that, as the UK currently has low loss of life due to fire (The UK has 4.5 fire deaths per year per every 1 million), there was arguably not an overwhelming case for lowering the height of residential high rise buildings in which fire suppression systems should be installed. However insurers state that while the numbers of fires are in decline, losses per fire are increasing.

27.6.1. In 2004, there were £812 million of fire-related losses from 125,000 claims – an average claim cost of just under £6500;

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27.6.2. Yet in 2015, there were £1.14 billion of fire-related losses from 58,000 claims – an average claim cost of just under £20,000. (source ABI)

28. It was felt to be important that care homes, supported housing, schools and other similar buildings should be built well in the first place. However, at the same time it was acknowledged that there is an urgent need to bring existing care homes and schools up to safety standards to that of commercial buildings. Public buildings – such as hospitals, schools and care homes should be considered as commercial properties and have the most appropriate fire safety systems. Thought should also be given at the design stage to the location of, for example, vulnerable residents/service users.
29. A strong starting point would be building new structures with heat resilient materials, not being allowed to compromise on cheap, possible combustible materials. Some builders have adopted using a light timber frame in new-builds, which is an extremely combustible material. Some schools are made of wood and polystyrene panels.
30. There is uncertainty over the cost of retrofitting. The working group was quoted figures of £4-10,000 per flat and there is no guarantee of access to leasehold flats, but our research on this point was not comprehensive.
31. These figures do not include maintenance costs and maintenance also requires continued access.
32. A number of the concerns about retrofitting AFSS were addressed in the evidence session.
- 32.1. There were mixed views on the difficulties posed by asbestos in blocks which might be disturbed by installation. One figure quoted was a 25% increase in installation costs (to £4k per flat) as a result of this factor.
- 32.2. Water supply has certainly been an issue in Wales and is recognised as an issue that would arise were London to follow the Welsh example. However 'lo-flow' technology can allow the existing mains to be used.
- 32.3. There are issues around accreditation of installers, which significant increases in demand would exacerbate, and the standards around installation. The group was told that BS291 is a very loose standard and needs tightening
- 32.4. Retrofitting needs a workforce that is trained to work in people's homes. Sprinkler installation must be done by competent people with the right mind-set. Blanket installation could lead to a lowering of standards and there had been examples of poor installation recently.

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32.5. Access to leaseholder properties is still a major issue, but some felt leaseholders have been more accommodating post-Grenfell. Access to tenanted properties can also be an issue. Education and engagement are critical here.

32.6. Retrofitting can be much more complex in practice than it appears on paper and a standard approach to all blocks is not practical.

32.7. It is intrusive work. It was essential that the work site was left in a fire safety state every night. It was important to check at the end of every day that no compartmentation had been compromised. Using a clerk-of-works can be helpful here.

Conclusions of the Working Group

33. Paragraphs 6.1 (lowering the height at which AFSS are required in new buildings) and 6.3 (mirroring the requirement in Wales that AFSS be provided in all new domestic residences) are alternatives. The group could recommend that all new domestic premises have to be fitted or only domestic premises over 18m (or no change to the status quo).

33.1. The case for mirroring the Welsh regulation was not felt to be strong. The cost benefit evidence suggests that there may well be other fire safety measures that should be a higher priority. The Welsh regulations have run into practical difficulties, with many developers bypassing the legislation. The evidence we received indicated that the industry might struggle to cope with the increase in demand if this course was taken without a significant lead-in time – with implications for quality.

33.2. On balance therefore it was decided not to recommend the change suggested at 5.3.

34. On reflection it was felt that paragraph 6.2 covers two distinct groups of buildings: those where vulnerable people sleep (including residential schools) and non-residential schools.

34.1. In the case of non-residential schools, sprinklers are currently an expectation. **The group concluded that there is no need to recommend a change to existing DfE guidance on the provision of sprinklers in schools.**

35. There is clearly a case to consider for lowering the height at which AFSS are required and for extending protection to premises where vulnerable people sleep. AFSS work and have been shown to be cost effective in these circumstances.

36. Fire safety must be considered in a holistic, risk-based manner, a point raised by several witnesses. The case for additional protection where vulnerable people are involved is based on the fact that they are inherently at greater risk when there is a fire.

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37. Members felt the case for lowering the height requirement and requiring additional protection for vulnerable residents was so strong as to require prescriptive measures.
38. Applying such measures retrospectively, as envisaged in paragraphs 6.4 and 6.5 has potentially significant financial implications.
39. On the other hand it is hard to argue that people living in buildings constructed 40 years ago should enjoy less protection from fire than those living in new buildings.
40. Any recommendation in respect of retrofitting needs to dovetail with the work arising out of Dame Judith Hackitt's recommendations at paragraph 21.5 above, assuming that this work covers all relevant buildings. In any case retrofitting of AFSS needs to be considered within a comprehensive assessment of the fire safety of a building
41. On the question of lobbying it was felt that the current focus of policy debate is national, given the Government's intention to pursue Dame Judith Hackitt's recommendations and that the most effect form of LGA activity in this area would be to seek to influence the outcome of Government reform so that it reflected the recommendations set out below.

Recommendations

42. The Group agreed the following recommendations:
 - 42.1. The height of residential high rise buildings in which AFSS should be installed in new buildings should be lowered to bring the provision in England in line with Scotland.
 - 42.2. AFSS should be installed in all newly-built premises where vulnerable people sleep unsupervised. This would include residential schools and care homes
 - 42.3. The requirements placed on duty holders in existing HHRS buildings in Dame Judith Hackitt's report should apply to all residential buildings over 18m and all buildings where vulnerable people sleep (other than private dwellings).
 - 42.4. In the absence of the requirement at 41.3 above, owners of buildings over 18m high or where vulnerable people sleep unsupervised should be required to retrofit AFSS as part of a proportionate risk-based programme of fire safety management.
 - 42.5. For the purposes of this report 'vulnerable people' means those who cannot reasonably be expected to evacuate a building as quickly as others due to disability or age (this includes children as well as the elderly).

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42.6. Any building owner installing AFSS under the provisions of paragraphs 42.3 – 42.4 should have the legal right to enter leasehold premises for the purposes of installing and maintaining sprinkler systems

42.7. The Government should commit to providing assistance to any council experiencing financial difficulty in meeting its obligations under 41.3-4 as it had done in respect of the remediation of social housing blocks with flammable cladding.

42.8. The LGA should lobby at national level to influence the development of policy in the wake of the Hackitt Report.

Implications for Wales

43. None. Building Control policy is a devolved matter.

Financial Implications

44. This programme of work will be delivered with existing resources.

Next Steps

45. The working group has asked officer to circulate the report to the LGA's Leadership Board to seek approval of the recommendations as the LGA's position and for a joint statement in line with that position to be agreed with NFCC

46. Officers to meet NFCC to discuss how we can work together, to produce a joint statement as discussed by the FSMC and to influence legislation in line with our shared aims around sprinklers and feedback to the working group

47. Officers to produce a piece for the fire conference publication and consider the LGA's role in spreading best practice