International

SprinklerScene

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British Engineering Report Supports Sprinkler Trade-Offs

A new report prepared by one of the world's premier fire protection engineering firms endorses the use of sprinkler "trade-offs" or design alternatives. The Arup Fire report, developed at the request of the British Automatic Fire Sprinkler Association and titled *Sprinklers for Safety – Use and Benefits of Incorporating Sprinklers in Buildings and Structures*, includes examples of trade-offs that can be taken beyond those recognized by current British codes, and discusses ways in which sprinklers can be taken into consideration for fire engineering analysis in order to achieve the required design goals. The new report also includes individual chapters devoted to discussions of residential sprinklers, water mist suppression systems, and cost versus benefit.

As examples of sprinkler trade-offs that are currently recognized in the United Kingdom, the appendix references the Approved Document B on fire safety for England and Wales, the various Technical Handbooks in use in Scotland, the Technical Booklet E on fire safety for Northern Ireland, the 2003 Isle of Man Building Regulations, the British Standard 5588 series dealing with fire precautions in the design, construction and use of buildings, Healthcare Technical Memoranda (HTM) and Scottish Healthcare Technical Memoranda (SHTM), the London District Surveyors' Association guides, the Building Research Establishment documents for the design of smoke ventilation systems, the LPC Design Guide for the Fire Protection of Buildings 2000, UK government publications "Fire safety - An employer's guide" and "Guide to safety at sports grounds," and British draft standard DD 9999, which is under development to supersede the BS 5588 series. All of these documents contain incentives for the use of fire sprinklers in lieu of passive protection and other alternative fire safety measures.

The report notes that sprinkler systems have "clear advantages in their use, many of which should either reduce the overall building cost or which allow the approval of a particular design which would otherwise be considered 'unsafe'." The report goes on to state: "Sprinklers are being used increasingly, as part of an informed fire risk assessment process, to improve the fire safety requirements of existing buildings and historically important buildings and their contents." With regard to water mist systems, the report recommends consideration of design trade-offs on a case by case basis "until guidance detailing performance requirements for mist systems is developed in the U.K."

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Norwegian Study of Heritage Suppression Systems Faults Humans

A new report prepared by the Norwegian Directorate for Cultural Heritage (RNDCH) entitled *Analysis of Sprinkler Failures in Listed Heritage Buildings* is subtitled "Analysis of unintended activations of water based extinguishing systems in Norwegian heritage buildings". The February 2006 report was prepared in support of the activities of COST 17, the committee for European Cooperation in Scientific and Technical Research – Action C17 - Built Heritage: Fire Loss to Historic Buildings. In addition to reviewing data from other sources, the report examines 27 incidents of unintended activation of water based suppression systems that took place in heritage buildings in Norway between 1986 and 2005. During this period of time the RNDCH was enforcing an extensive maintenance program for its historical knave churches, but the incident reports include other heritage properties as well.

The ten "dominating factors causing failures," listed in order of significance, can be summarized as follows:

1. Human error
2. Part not addressed by standards added to serve need related to heritage
3. System required more skill to operate than provided by maintenance staff
4. Condition required by the heritage application not addressed by standards
5. Complicated system, installation, or procedures
6. Fault in manufactured part
7. Fault in system installation
8. Fault in system engineering design
9. Freezing
10. Unexpected condition, unforeseen and unlikely to reoccur at the building

The analysis of the data led to the following two general conclusions:

"1. Special accessories to sprinkler or mist systems, notably detection systems, required by heritage concerns, are very often the main cause of failure.

"2. Systems are too complicated to design, install and maintain. The designs do not fit the harsh climate conditions well. The installations are uncommon to local service and maintenance personnel. Some of these factors relate to the objects being at remote locations far from cities; still, most of the incidents would have occurred at any location."

Of the various failure factors, the report makes recommendations with respect to only two: complexity and freezing, calling for avoidance of detection-operated systems in favor of automatic sprinklers installed in unpressurized preaction systems, with double-knock (one heat detector and one smoke detector) release of the system water supply.

Participation Invited - Sprinkler Usage Survey for 2004 and 2005

The International Fire Sprinkler Association periodically conducts an informal survey of estimated worldwide fire sprinkler usage. Please use this form to participate, entering your best estimate of total sprinklers used in any or all of the 25 geographical areas listed. The survey results are weighted based on the confidence level indicated by the submitter. The results will be published in the IFSA *SprinklerScene* and can be viewed at www.sprinklerworld.org.
Note: All figures should be in millions. Example: 100,000 sprinklers/year = 0.1

Geographic Area	2003 Estimate	2004 Estimate	2005 Estimate	Confidence Level
				H=High, M=Med, L=Low
1. Canada	3.0	_____	_____	_____
2. Mexico	0.4	_____	_____	_____
3. United States	36.7	_____	_____	_____
4. Central America (inc. Carib.)	0.3	_____	_____	_____
5. South America	0.6	_____	_____	_____
6. United Kingdom and Ireland	1.7	_____	_____	_____
7. Germany	2.0	_____	_____	_____
8. France	1.3	_____	_____	_____
9. Scandinavian Countries (Nor., Swe., Den., Fin. and Ice.)	1.0	_____	_____	_____
10. Italy	0.5	_____	_____	_____
11. Low Countries (Belg., Neth., and Lux.)	0.9	_____	_____	_____
12. Austria and Switzerland	0.5	_____	_____	_____
13. Spain and Portugal	0.8	_____	_____	_____
14. Russia, Belarus and Ukraine	0.6	_____	_____	_____
15. Israel	0.6	_____	_____	_____
16. Other European / Mid-East	1.5	_____	_____	_____
17. China (inc. Hong Kong)	11.5	_____	_____	_____
18. Japan	2.5	_____	_____	_____
19. Korea	2.2	_____	_____	_____
20. Singapore and Malaysia	1.2	_____	_____	_____
21. Taiwan	1.0	_____	_____	_____
22. Other Asian and Pacific	1.3	_____	_____	_____
23. Africa (inc. Egypt)	0.5	_____	_____	_____
24. Australia	1.2	_____	_____	_____
25. New Zealand	0.3	_____	_____	_____

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World Sprinkler News

Norway Weighs Costs of Sprinklers for Homes. Tor Suhrke, Department Director of the Norwegian Directorate for Civil Protection and Emergency Planning, suggested in an interview published in the November 30th issue of *Aftenposten*, Norway's leading newspaper, that fire sprinklers would be appropriate to reduce the 40 to 50 lives lost each year in home fires in that country. The same day a government press release pointed out that Norway was the first European country to require smoke detectors in homes. Wiran Bjørkmann of Standards Norway subsequently stated that, although sprinklers are definitely needed in homes for the aged and other occupancies where people are not able to make a swift egress by themselves, a general requirement for homes would only be appropriate if there were about 800 fire deaths per year in the country. Even without legislation, Norway already installs about 50,000 sprinklers in homes each year.

Europeans Move to Sprinklers in High-Rise. The European Fire Sprinkler Network reports that the vulnerability of high-rise buildings to fire is being recognized across Europe with new requirements. Germany has introduced a requirement for sprinklers in new high-rise commercial buildings over 30m in height and for residential buildings over 60m in height; Scotland requires sprinklers in new residential buildings over 18m in height; Catalonia for all new buildings over 50m in height, and England is expected to introduce requirements for sprinklers in residential buildings over 30m in height.

Upcoming Meetings, Seminars, and Exhibitions of Interest

20 March 2006 – Seminar on Technical and Economical Advantages of Fast Response Sprinklers, Beijing, China

27-28 March 2006 – 6th International Fire Sprinkler Conference, International Fire Sprinkler Association, Lisbon, Portugal (www.sprinklerworld.org)

25-26 May 2006 – Heritage Protection International, Joint Conference of NFPA Cultural Resources Committee and COST C17 Committee, Ljubljana, Slovenia (www.szpv.si/heritage.php)

5-8 June 2006 – NFPA World Safety Congress and Exposition, Orlando, Florida, USA (www.nfpa.org)

6 June 2006 – IFSA Board of Governors 8th Annual Meeting, Orlando, Florida, USA (www.sprinklerworld.org)

13-15 June 2006 – 6th International Conference on Performance Based Codes and Fire Safety Design Methods, Tokyo, Japan, Society of Fire Protection Engineers (www.sfpe.org)

18-20 July 2006 – Americas Fire and Security Expo, Miami Beach, Florida, USA (www.nfpa.org)