LOG OF MEETING

SUBJECT: Fire Sprinkler Performance Issues

DATE: June 7, 1999 **LOCATION:** Room 410A, East West Towers

DATE OF LOG ENTRY: June 8, 1999

SOURCE OF LOG ENTRY: William H. King, Jr., ES

CPSC PARTICIPANTS:

William H. King, Jr., ES
Andrew Stadnik, ES
Nick Marchica, ES
Amy Brown, Compliance
Eric Singer, Compliance
Rikki Khanna, ES
Ron Medford, EXHR
Russ Rader, EXPA

NON-CPSC PARTICIPANT:

Tom Groos, Viking Corporation
Gordon Gillerman, Underwriters Laboratories Inc. (UL)
Sara Yerkes, National Fire Protection Association
Jim Heeschen, U.S. Fire Administration
John Ottoson, U.S. Fire Administration
Raymond M. Moats, Fairfax County Fire Marshal's Office
Francis J. Teevan, Fairfax County Fire Marshal's Office
Paul Fitzgerald, Factory Mutual Research Corporation
Rich Ferron, Factory Mutual Research Corporation
Caroline Mayer, Washington Post
Tom Castino, UL
Kerry Bell, UL
John A., Viniello, National Fire Sprinkler Association
Russ Fleming, National Fire Sprinkler Assocation
Steve Wasserman, UL

SUMMARY:

The meeting was held at the request of the National Fire Sprinkler Association (NFSA). A tentative meeting agenda was prepared by NFSA (attached).

Mr. Bell, UL engineer, explained the activities of UL related to dry sprinklers, which he indicated are sprinklers installed in harsh environments, such as parking

garages. Mr. Bell said that UL had initiated a "Tentative Interim Amendment" (TIA) request to the National Fire Protection Association (NFPA) to NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems, 1998 edition. The TIA requested a change in the code from 50 years to 10 years for the interval that dry sprinklers shall be operationally evaluated. Mr. Bell explained that the TIA resulted from tests conducted by UL on more than 100 sprinklers taken from installations. Mr. Bell made reference to a UL news release of January 22, 1999. He indicated that, to date, UL has now conducted about 200 tests, which provide additional support for the TIA. The UL testing found that a significant number of dry sprinklers required greater than 7 psi to operate; some of these sprinklers were taken from installations 10-15 years old, some as old as 50 years, and some were in service only 5-6 years.

Industry representatives noted that no official NFPA decision regarding the TIA has been made as yet, but that the proposed amendment is considered prudent action. The NFPA Standards Council is scheduled to take up the matter at their July meeting in Halifax, NS. CPSC staff indicated that they have not yet commented on the proposed TIA. Comments are due by June 18, 1999.

Another NFPA document, NFPA 13A, described by industry members as a recommended practice document, was reported as indicating that, after 50 years, sprinklers should be replaced. However, it was pointed out that the NFPA 25 code only indicates that sample testing should be done at the 50 year date, except that quick response sprinklers should be sample tested after 20 years. It was noted that New York City requires replacing sprinklers that pre-date 1920.

A representative from the Factory Mutual Research Corporation noted that old sprinklers have never been a safety issue, although there have been numerous cases of piping problems associated with sprinkler systems. Factory Mutual further indicated that they test sprinkler installations on a regular basis; all types; not just dry sprinkler types. Factory Mutual noted that the most common problems noted were abuse of the sprinkler associated with either painting the sprinkler, mechanical damage, or use with highly corrosive water supplies.

Representatives from UL indicated that sprinkler field performance under fire conditions was excellent, although operational testing may indicate otherwise. UL pointed to a recent horse barn fire where the fire was confined to one stall, the one in which the sprinkler activated to limit the fire and protect the horses.

UL and industry members described the phenomenon called dezincification of brass, where zinc slowly comes out of the brass alloy, which can result in potential sprinkler operational problems including leaking. They indicated that reports from the field identified this situation. At an April 1999 meeting of a UL Industry Advisory Conference (IAC), a proposed test method was discussed for brass parts that exceed 15% zinc. UL indicated that they were working with industry members in a series of round robin tests to see if the proposed test method was repeatable with consistent results. UL

plans to propose a new test protocol in the first quarter of calendar year 2000. Round robin test results are expected to be available in 8-10 weeks, according to UL. CPSC staff expressed interest in participating in the deliberations associated with dezincification, and indicated a concern with the 144-hour test duration.

UL and the sprinkler industry representatives noted potential problems related to the performance of some sprinklers due to use of "O-rings" in a dynamic application in their design. They indicated that since these potential problems are difficult to address with performance tests, UL proposes to restrict the use of O-rings in this application. It was indicated that the O-ring problem might be related to contaminants. When asked by CPSC staff if there were any plans to replace sprinklers in the field that incorporate O-rings, the industry responded that there is no field data to support such an action.

With regard to residential sprinkler fire test repeatability, Mr. Paul Fitzgerald, Factory Mutual Research Corporation, indicated that when Factory Mutual uses the test program specified in the UL standard for residential sprinklers, they get inconsistent results. Therefore, Factory Mutual could not support recognition of the UL standard as the American National Standard following the procedures of the American National Standards Institute (ANSI). Mr. Fitzgerald further noted that although UL and Factory Mutual are cooperating in their attempts to resolve this problem, the test is still not repeatable. He indicated several areas in the test that may cause inconsistent results, including variations in the foam material used as the fuel in the testing, and the location of thermocouples.

UL indicated that resolving the fire test repeatability issue for residential sprinklers is a top priority for them and that they are working toward achieving a reproducible test. UL further indicated that they would like to see this matter resolved within the next few months, and that they recognize that it is holding up the ANSI recognition. UL said that while sprinklers respond to the test fires, depending on the materials used in the test, the water flow might not be enough to put fires out in some test runs. UL said that they would welcome CPSC staff's input on this matter.

The sprinkler industry representatives described a TIA regarding design considerations that the NFSA has submitted to NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies Up To and Including Four Stories in Height. These amendments relate to recognition of NFPA 13R by the model building code groups. The sprinkler industry representatives noted that the acceptance of sprinklers by model building code groups is important when these groups consider construction trade-offs when sprinklers are used in residences.

The sprinkler industry representatives concluded their presentation by indicating that sprinklers often activate to limit and extinguish fires while in service, and such events are often not reported as success stories. The industry representatives are concerned that CPSC staff might only focus on events that indicate that sprinklers are not responding to extinguish fires. They also expressed concerns about the limitations of CPSC staff's attempts to obtain field data.

On behalf of the CPSC staff, Mr. Medford indicated that CPSC staff will be evaluating sprinkler responses to fire situations when they occur in the field, as well as evaluating the performance of sprinklers collected from the field and tested under laboratory conditions. Both types of data will be collected. Mr. Medford indicated to the sprinkler industry that the CPSC staff was not prepared to specifically discuss their work and work plans at this time. He concluded the meeting by thanking the sprinkler industry and the testing laboratories represented at the meeting for sharing their current activities and concerns.

NFSA/CPSC/UL/FM
Meeting on Fire Sprinkler Performance Issues

June 7, 1999
Bethesda, Maryland
10:00 a.m.

Tentative Agenda

I. Call to Order and Introductions

II. Report on Current Sprinkler Initiatives

A. Dry sprinkler Tentative Interim Amendment
B. Round robin testing for dezincification
C. Consideration of ban on O-rings
D. Residential sprinkler fire test repeatability
E. Residential sprinkler (NFPA 13 and 13R) design area Tentative Interim Amendments

III. CPSC Programs and Projects

A. Sprinkler field performance reports
B. Research plans
C. Other current efforts

IV. Additional Discussion Items

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