



## COMMONWEALTH of VIRGINIA

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### Virginia Department of Fire Programs

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#### MEMORANDUM

TO: Fire and Building Officials

FROM: Ed Altizer, State Fire Marshal  
*Charles E. Altizer*

SUBJECT: Fire Protection Systems-Dry Sprinkler Heads

On October 14, 2009, the State Fire Marshal's Office (SFMO) issued a memorandum to Fire and Building Officials regarding failures of dry sprinkler heads. Dry sprinklers are generally installed in locations subject to fluctuating environmental conditions such as extreme temperature variations, high humidity and/or corrosive conditions. Dry sprinklers may be found in cold storage warehouses, loading docks, balconies, attics, parking garages, and unheated portions of buildings. Today's communication provides additional information for building owners.

#### Introduction

In the October 14<sup>th</sup> memorandum, the SFMO noted that it had reviewed Underwriters Laboratories, Inc., testing reports of sample dry sprinkler heads taken from buildings where Reliable G-3 dry sprinkler heads failed to activate during fires. Accordingly, the SFMO indicated that in order to render the equipment safe under the Virginia Statewide Fire Prevention Code, (SFPC) the sprinkler heads should be replaced.

The SMFO received several calls about that informational memorandum. With today's communication, the SFMO is providing additional information regarding the responsibilities of building owners with respect to inspection, testing, maintenance, or replacement, as necessary, of dry sprinkler heads and fire protection systems. The SFMO notes that the Underwriters Laboratories, Inc., test results indicated that virtually all of the sprinklers for which sprinkler-specific data was available showed some level of corrosion and many had been installed in harsh environments. Additionally, based upon the manufacture date stamped on the sprinkler heads, almost all of the sprinklers

for which sprinkler-specific data was available were installed 10 or more years ago. Although the Reliable G3 series dry sprinkler heads have been the subject of

third-party independent laboratory testing, the SFMO urges property owners and building managers to develop, as required by the SFPC, an inspection and testing schedule for **all** dry Sprinkler heads to determine if the dry sprinklers are functioning properly. With today's communication, the SFMO is clarifying that, based upon the test results it received, the SFMO believes that while replacement is warranted pursuant to Section 901.10 of the SFPC, building owners' shall establish timetables for the inspection, testing, maintenance and replacement, as necessary, of fire protection systems.

### **Building Owners' Responsibilities: Inspection, Testing, and Maintenance of Fire Protection Systems**

As pointed out in the October 14 informational bulletin, the SFMO has gathered research indicating the failure of dry sprinkler heads to function during both fire events and under laboratory conditions. This research underscores the need for building owners and managers whose buildings are equipped with sprinklers, particularly dry sprinklers, to inspect and test the equipment and replace as necessary.

Based on the provisions of the SFPC, it is the responsibility of building owners, not sprinkler manufacturers, to inspect, test, maintain, and replace, as necessary fire protection systems. Section 901.6.1 of the SFPC requires that water-based fire protection systems be inspected, tested, and maintained pursuant to National Fire Protection Association (NFPA) Standard 25, as incorporated by reference in the SFPC. Under NFPA 25 building owners are required to take the following actions, including but not limited to:

- 5.2.1.1. Sprinklers shall be inspected from the floor level annually.
- 5.2.1.1.1. Sprinklers shall not show signs of leakage; shall be free of corrosion, foreign materials, paint, and physical damage; and shall be installed in the proper orientation (e.g., upright, pendent, or sidewall.)
- 5.2.1.1.2. Any sprinkler shall be replaced that has signs of leakage; is painted, other than by the sprinkler manufacturer, corroded, damaged, or loaded; or in the improper orientation.
- 5.2.1.1.3. Glass bulb sprinklers shall be replaced if the bulbs have emptied.
- 5.2.1.1.6. Sprinklers that are subject to recall shall be replaced per the manufacturer's requirements.

- 5.3.1.1. Where required by this section, sample sprinklers shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing.
- 5.3.1.1.1. Where sprinklers have been in service for 50 years, they shall be replaced or representative samples from one or more sample areas shall be tested. Test procedures shall be repeated at 10-year intervals.
- 5.3.1.1.1.1. Sprinklers manufactured prior to 1920 shall be replaced.
- 5.3.1.1.1.2. Sprinklers manufactured using fast-response elements that have been in service for 20 years shall be replaced, or representative samples shall be tested. They shall be retested at 10-year intervals.
- 5.3.1.1.1.5. Dry sprinklers that have been in service for 10 years shall be replaced, or representative samples shall be tested. They shall be retested at 10-year intervals.
- 5.3.1.1.2. Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, on a 5-year basis, sprinklers shall either be replaced or representative sprinkler samples shall be tested.
- 5.3.1.2. A representative sample of sprinklers for testing per 5.3.1.1.1. shall consist of a minimum of not less than four sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater.
- 5.3.1.3. Where one sprinkler within a representative sample fails to meet the test requirement, all sprinklers within the area represented by that sample shall be replaced.

Building owners are encouraged to review the SFPC for all requirements related to inspection, testing, and maintenance of fire protection systems. I call your attention to section 5.3.1.1.1.5, above, regarding dry sprinklers and the requirement for replacement or testing at 10 year intervals. This is a new requirement adopted by the Board of Housing and Community Development in the 2006 Virginia Statewide Fire Prevention Code which became effective on May 1, 2008.

### **Next Steps**

The SFMO has already contacted all state agencies and asked for a review of their sprinkler inventories to determine if dry sprinkler heads are in use. Many state agencies identified the use of dry sprinkler heads, and the SFMO asked state agencies to develop a plan for inspection, testing, maintenance, and replacement, as necessary, of this equipment.

In those jurisdictions without local enforcement of the SFPC, the SFMO is the authority having jurisdiction, and the SFMO will work with building owners to assist in the development of plans for inspection, testing, maintenance, and replacement, as necessary, of the equipment. In those areas without local enforcement of the SFPC, the SFMO will undertake enforcement action pursuant to the SFPC, if the building owners are not in compliance with the inspection, testing, and maintenance requirements of the SFPC.

Additionally, the SFMO will continue to notify client groups, trade associations, and building owners of their obligations to conduct the required inspection, testing, and maintenance of fire protection systems. The SFMO will provide educational and informational press releases when appropriate and provide assistance in delivering the message to building owners. Building owners are reminded to coordinate with the local building officials as needed on fire protection system replacement projects, and that a building permit may be required.

### **Conclusion**

The SFMO is ready to assist fire and building officials in their efforts to educate building owners about the responsibility to inspect, test, and maintain fire protection equipment. For additional information, or if you have any questions you may contact Ron Reynolds, Chief Deputy, SFMO, at 804-612-7268 or [ron.reynolds@vdfp.virginia.gov](mailto:ron.reynolds@vdfp.virginia.gov). Information will be placed on the website of the Virginia Department of Fire Programs at [www.vafire.com](http://www.vafire.com).