INTERNATIONAL CODE COUNCIL

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CODE CORNER

ABOUT CODE CORNER

CCFS would like to remind you to check with your local "Authority Having Jurisdiction (AHJ)" for questions and opinions concerning your local Fire and Building Codes. The information contained in this article is supplied as a courtesy by the International Code Council (ICC) and is based on the International Fire and Building Codes and their respective commentaries. Your local codes or ordinances may vary.

Inspection, Testing and Maintenance of Fire Detection, Alarm and Extinguishing Systems

901.6 Inspection, testing and maintenance. Fire detection, alarm and extinguishing systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired fire protection systems and equipment shall be inspected, tested and maintained or removed.

☿ *Adequate maintenance, inspection and periodic testing of all fire protection systems, equipment and devices is necessary so that the systems are ready to perform their intended functions should fire occur.*

An inspection consists of a visual check of a system or device to verify that it is in operating condition and free from defects or damage. Indicating valves, gauges and indicator lamps are a few of the features required by the codes to facilitate this activity. Obvious damage and the general condition of the system, particularly the presence of corrosion, both external and internal, must always be noted and recorded. Partially because they are less detailed, inspections are conducted more frequently than tests and maintenance. Because special knowledge and tools are not required, inspections may be performed by any reasonably competent person.

Periodic tests following standardized methods are intended to confirm the results of inspections, determine that all components function properly and that systems meet their original design specifications. Tools, devices or equipment are usually required for these tests.

Because tests are more detailed than inspections, they are usually conducted only once or twice per year in most cases. Some tests, however, may be required as frequently as bimonthly or quarterly (for example, some fire alarm system equipment) or as infrequently as five-, six- or 12-year intervals (for example, portable fire-extinguisher hydrostatic tests). Since specialized knowledge and equipment are required, testing is usually done by technicians or specialists trained in the proper conduct of the test methods involved.

Periodic maintenance keeps systems in good working order and may be used to repair damage or defects discovered during inspections or testing. Specialized tools and training are required to perform maintenance.

Only properly trained technicians or specialists should perform required periodic maintenance. Most maintenance is required only as needed, but many manufacturers suggest or require regular periodic replacement of parts subject to wear or abuse.

Non-required fire protection systems, where installed, require the same level of maintenance as required systems. If required maintenance is not being done, there is no way to determine if the system will function as intended. Therefore, inadequately maintained, nonrequired systems must be removed to avoid creating a false impression of adequate protection.

901.6.1 Standards. Fire protection systems shall be inspected, tested and maintained in accordance with the referenced standards listed in Table 901.6.1.

☿ *Specific requirements related to inspection practices, testing schedules and maintenance procedures are dependent on the type of fire protection system and its corresponding referenced NFPA standard as indicated in Table 901.6.1.*

TABLE 901.6.1 ...FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001

☿ *This table lists the NFPA referenced standards to be used for the inspection, testing and maintenance criteria for various fire protection systems. Many of the testing and maintenance requirements are included elsewhere in Chapter 9 of the code.*

901.6.2 Records. Records of all system inspections, tests and maintenance required by the referenced standards shall be maintained on the premises for a minimum of three years and shall be copied to the fire code official upon request.

☿ *Accurate, up-to-date records are required to document the history of system inspection, testing and maintenance. Record keeping is not intended simply to prove to the fire code official that required inspection, testing and maintenance are being performed, but to assist the owner or his or her agent in performing these functions. A well-kept log helps an owner or technician determine how the system is performing over time and how changes inside and outside the protected premises are affecting system performance.*

For example, automatic sprinkler system main drain test results may indicate whether the public water supply is being degraded by development, thereby impairing sprinkler system capabilities. Similarly, a history of accidental alarms at a specific smoke detector may indicate that the device requires cleaning or maintenance. These records must be kept on the premises of the affected building. The records must not be stored at a management office for a building that is not in the immediate area. However, where a cluster of buildings exists, a centralized location for record storage will aid the owner and the fire code official. Similarly, buildings such as warehouses that are typically unoccupied but are located adjacent to an occupied building, such as an office, can have their records maintained in the office building so that they are protected and secured. The remoteness of the unoccupied building to the one in which the records are kept is key to the determination of whether or not the records are kept "on the premises."

901.6.2.1 Records information. Initial records shall include the name of the installation contractor, type of components installed, manufacturer of the components, location and number of components installed per floor. Records shall also include the manufacturers' operation and maintenance instruction manuals. Such records shall be maintained on the premises.

☿ *When the fire protection systems are first installed an accurate inventory must be compiled so that future owners and officials can refer back to the documents for maintenance operational requirements. Additionally, if a recall is required, the installation inventory will be able to identify if any of the components subject to the recall are installed. By including the*

installation contractor's information in the list, a resolution of any legal aspects of defective components can be obtained more readily. Also, if operations or maintenance change during the life of the installation and a public notice is provided, the building owner will have the information necessary to know and apply the new requirements.

The requirement to collect and maintain this information is already within many of the standards referenced in the code. This requirement gives the fire code official enforcement language and assists the building owner in understanding the responsibilities associated with having these fire protection systems installed in the building.

901.7 Systems out of service. Where a required fire protection system is out of service, the fire department and the fire code official shall be notified immediately and, where required by the fire code official, the building shall either be evacuated or an approved fire watch shall be provided for all occupants left unprotected by the shut down until the fire protection system has been returned to service. Where utilized, fire watches shall be provided with at least one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

☿ *The protection afforded by a required fire protection system must not be diminished in any existing building except for the purpose of conducting tests, maintenance or repairs. The length of service interruptions must be kept to a minimum. The fire department and the fire code official must be notified of any service interruptions. They must carefully evaluate the continued operation or occupancy of buildings and structures where protection is interrupted. Whenever possible, all unaffected portions of the system should be kept in service. Until protection is restored, hazardous processes or operations should be suspended and alternative special protection should be considered in addition to an approved fire watch. The code text only addresses when a required system is placed out of service. However, if a system is in place, even though it is not required by the code or the IBC, it would be an appropriate courtesy to the fire department to inform it of the discontinuance or temporarily taking out of service of any fire protection system. If the nonrequired system is to be placed out of service for an extended period of time, the fire code official has the authority to address the condition under Section 901.4.4 and require that the system be either placed back into operation or removed so as not to create a false impression of protection.*

901.7.1 Impairment coordinator. The building owner shall assign an impairment coordinator to comply with the requirements of this section. In the absence of a specific designee, the owner shall be considered the impairment coordinator.

☿ *The impairment coordinator is the person responsible for maintaining the building fire protection systems. The impairment coordinator may be the building owner or other designee, such as the plant manager or building engineer, if he or she is trained to comply with the provisions of Section 901.7.*

901.7.2 Tag required. A tag shall be used to indicate that a system, or portion thereof, has been removed from service.

☿ *When any fire protection system is taken out of service it must be clearly identified with a visible tag that indicates the conditions of the impairment and who to notify. The tag is intended to alert building occupants and fire department personnel that the system in question is impaired. The tag must remain visibly in place until full protection is restored.*

901.7.3 Placement of tag. The tag shall be posted at each fire department connection, system control valve, fire alarm control unit, fire alarm annunciator and fire command center, indicating which system, or part thereof, has been removed from service. The fire code official shall specify where the tag is to be placed.

☿ *This section specifies some of the impaired locations where a tag must be used. Tagging a fire department connection, for example, is intended to alert the responding fire department that a normal operating*

condition does not exist for the portion of the system beyond the connection. While it is also important to tag system control valves, an impairment tag in the sprinkler riser room may not get noticed until accessed by fire department personnel. The final location of all impairment tags is subject to the approval of the fire code official.

901.7.4 Preplanned impairment programs. Preplanned impairments shall be authorized by the impairment coordinator. Before authorization is given, a designated individual shall be responsible for verifying that all of the following procedures have been implemented:

1. The extent and expected duration of the impairment have been determined.

2. The areas or buildings involved have been inspected and the increased risks determined.

3. Recommendations have been submitted to management or building owner/manager.

4. The fire department has been notified.

5. The insurance carrier, the alarm company, building owner/manager, and other authorities having jurisdiction have been notified.

6. The supervisors in the areas to be affected have been notified.

7. A tag impairment system has been implemented.

8. Necessary tools and materials have been assembled on the impairment site.

☿ *This section specifies the procedures that must be followed in a thorough preplanned impairment program. These procedures must be followed whenever systems are purposely impaired, such as for routine sprinkler system alarm testing. Proper notification of responsible parties eliminates the chance of false alarms, reduces disruption of normal business activities and encourages quick resumption of normal operations.*

901.7.5 Emergency impairments. When unplanned impairments occur, appropriate emergency action shall be taken to minimize potential injury and damage. The impairment coordinator shall implement the steps outlined in Section 901.7.4.

☿ *Unplanned impairments, of course, go beyond typical testing and maintenance procedures but are also not necessarily indicative of a fire event. For example, an unplanned emergency impairment might occur if a sprinkler head or pipe was found leaking or was accidentally impacted by a fork-lift truck. To reduce water damage and to repair the sprinkler system, the valve controlling the water supply to the affected area would need to be closed, thereby impairing protection to the area protected by that portion of the sprinkler system. The impairment coordinator must follow the procedures in Section 901.7.4 to restore protection in minimum time.*

901.7.6 Restoring systems to service. When impaired equipment is restored to normal working order, the impairment coordinator shall verify that all of the following procedures have been implemented:

1. Necessary inspections and tests have been conducted to verify that affected systems are operational.

2. Supervisors have been advised that protection is restored.

3. The fire department has been advised that protection is restored.

4. The building owner/manager, insurance carrier, alarm company and other involved parties have been advised that protection is restored.

5. The impairment tag has been removed.

☿ *Regardless of whether a system is taken out of service for either a planned impairment or for an emergency, this section specifies the procedures to follow when restoring a system to service. By following these procedures, all responsible parties who were informed of the initial impairment will also be made aware that the system is now fully operational. Restoring the system to service assumes the affected part of the system has been corrected and is in proper working condition.*

901.8 Removal of or tampering with equipment. It shall be unlawful for any person to remove, tamper with or otherwise disturb any fire hydrant, fire detection and alarm system, fire suppression system, or other fire appliance required by this code except for the purpose of extinguishing fire, training purposes, recharging or making necessary repairs, or when approved by the fire code official.

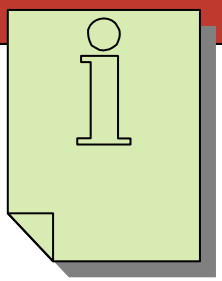
☿ *Tampering or otherwise unauthorized altering of any fire protection system or component is illegal. A person who unlawfully tampers with equipment could face potential criminal charges. Tampering could include intentionally pulling a manual fire alarm box when no emergency exists, playing with matches to set off a smoke detector or flowing a city fire hydrant. The use of fire protection systems, equipment and other fire appliances is limited to those people authorized to conduct repairs and maintenance unless approved by the fire code official.*

901.8.1 Removal of or tampering with appurtenances. Locks, gates, doors, barricades, chains, enclosures, signs, tags or seals which have been installed by or at the direction of the fire code official shall not be removed, unlocked, destroyed, tampered with or otherwise vandalized in any manner.

☿ *Tampering with or vandalizing appurtenances that are in place to prevent tampering with the system components is also prohibited. For example, sprinkler system control valves are routinely chained and locked in the open position in addition to being equipped with electronically monitored tamper switches. Gates at fire apparatus roads, authorized by Section 503.6 of the code, must not have the locks changed or operation altered unless approved by the fire code official. Any unauthorized removal or tampering with these types of devices is strictly prohibited.*

901.9 Recall of fire protection components. Any fire protection system component regulated by this code that is the subject of a voluntary or mandatory recall under federal law shall be replaced with approved, listed components in compliance with the referenced standards of this code. The fire code official shall be notified in writing by the building owner when the recalled component parts have been replaced.

☿ *This section provides the fire code official with a valuable tool for monitoring recalls. Under this provision, a code section can be cited that will allow the fire code official to enforce the recall. Product listings and compliance with reference standards is paramount in the effectiveness of fire protection systems. Companies may be under an agreement with federal agencies to "voluntarily" recall certain components or face legal action. While this is technically voluntary, it in no way reduces the need for the recall. To the extent that the company's livelihood depends on the recall being performed properly, the action is not voluntary. This section allows the fire code official to compel the building owner to comply with the recall and replace the component*



New NFPA report: "U.S. Experience with Sprinklers and Other Fire Extinguishing Equipment"

This new report by NFPA's John R. Hall, Jr. includes statistics on how often sprinklers (or other automatic extinguishing systems) are reported in fires, by property use, and their estimated impact in reducing the average loss of life and property per fire. The report also includes statistics on performance, usage and reliability of sprinklers and other automatic extinguishing systems, as well as leading reasons when system fail to operate, or operate but are ineffective.