# Concord Department of Fire and Life Safety

FIRE MARSHAL'S OFFICE

**July 24, 2006**

## Fire Department Response to Nuisance Fire Alarm Activations

Everyday throughout the United States, fire departments respond to numerous fire alarm activations. Automatically, most firefighters react with a sense of frustration when these alarms occur. Terms such as "Automatic False Alarm", "Great, another bicycle run", and "@#%^*, another fire alarm" are often used to describe the frustration. In 2003, United States fire departments responded to 2,189,500 false alarms (excluding good intent calls and smoke scares). Thirty-six percent (36%) of the false calls were due to system malfunctions, thirty-five percent (35%) of the false calls were unintentional calls, including incidents in which smoke alarms operated as designed, but the operation was unwelcome and unneeded such as activations while broiling (Source: NFPA).

Fire department responses are often reduced to single engine responses to occupancies with multiple alarms occurring within a shift or a specific time period. Recurring responses for fire companies often lead to complacency and apathy when responding to the occupancy. Firefighters often neglect to don PPE and upon arrival, neglect to bring standpipe hose kits and other essential tools. These conditions can lead to firefighter injuries, deaths and additional fire losses due to the extended time between arrival and the initiation of fire suppression operations.

To combat these problems NFPA and the Fire Codes require fire alarm systems to have routine maintenance and service. NFPA 72, Chapter 10 outlines Inspection, Test and Maintenance intervals for fire alarm components, initiation devices and notification appliances. Frequencies for the visual inspection and testing of the above devices are listed in Table 10.3.1 and include requirements for weekly, monthly, quarterly, semi-annual and annual testing. Chapter 9 of the International Fire Code requires Fire Alarm Systems to be inspected and maintained in accordance with NFPA 72. Even with proper maintenance nuisance alarms still occur at occupancies protected by fire alarms.

After the cause for the alarm has been thoroughly investigated and the alarm has been determined to be a false activation, the company officer must identify the individual, device, system, situation or environmental condition creating the problem. In cases of intentional alarms, those persons responsible for the activation should be identified, removed from the premises, fined and/or prosecuted.

In cases of accidental activation, the problem creating the alarm should be identified. Problems can range from major issues such as circuit board failure due to a short-circuit, wear and tear, sprinkler water flow or lightening strikes; to minor problems such as steam, moisture, dust, cobwebs or insect nest in-front of or inside a detector. Obstructions, sunlight or light reflections can often affect beam type smoke detectors or infrared detection devices creating false activations.

Major problems will require the company officer to require the occupancy to initiate a “Fire Watch” as required by the Fire Code. Fire Codes also place requirements for fire alarm systems and/or sprinkler systems to be repaired by personnel trained and qualified to repair those systems.

**Smoke Detector Activation**

In cases of minor fire alarm problems, simple solutions are often available to the company officer to either correct or reduce any further alarms. Photo-Electric smoke detectors operate on light being projected from a sending unit to a receiving unit. Ionization type smoke detectors operate by a “magnetic” field being generated inside the detection chamber of the device. Any obstruction of the light or field will create false activations. A solution to correcting false alarms involving the activation of a smoke detector can be corrected by taking a can of compressed air (Computer Duster) and dusting or “Blowing” out the detector. This operation should remove the condition creating the problem but the detectors sensitivity should be tested to ensure it is still within the manufacturer’s operating guidelines. In cases of repeated false alarms involving steam or vapors from cooking and baking operations heat detectors *may* be substituted for smoke detectors to provide protection for those areas.


**Computer Duster**

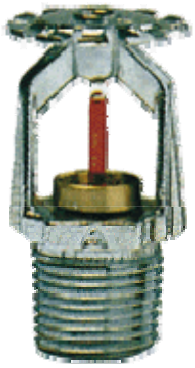
**Beam Type Detector Activation**

Beam Type Smoke Detectors or Infrared devices activating due to obstructions, light reflections or sunlight can also be corrected by simple means. Beam Smoke detectors require a beam of “light” to be projected from a sending unit to a receiving unit. If the light beam is obstructed the unit will transmit an alarm. These problems can be corrected by identifying and removing the obstruction.

Infrared detectors operate by “looking” for the varying light intensities of fire. Detector operation can be affected by sunlight and reflections. If the problem is identified as a reflection, remove the condition creating the reflection. If the condition is related to sunlight, have facility maintenance personnel shade the unit to remove the light condition. Care should be taken not to obstruct the area, process or tank being protected by either of these devices and the units should be inspected and tested to ensure they are in proper working order as soon as possible.

**Beam Type Smoke Detector**

**Sprinkler System Activation**



Water flow switch activations can occur for obvious reasons such as a sprinkler system activating due to a head being damaged or not so apparent reasons such as water system fluctuations, pressure variations and fire or jockey pump operation. In any of these cases the company officer should direct facility maintenance personnel to have the problems identified and repaired immediately.

Fire department personnel should not perform these operations due to liability concerns. The company officer should require the facility to have the system inspected and/or tested immediately by personnel trained and qualified to repair Fire Alarm systems. Referrals to fire prevention officials should be made as soon as possible documenting and outlining the reasons for the false activations and the procedures implemented by facility personnel to lesson or correct the problem.

Fire prevention personnel should promptly follow-up on all referrals and ensure that the device, system, situation or environmental condition creating the problem has been properly corrected. The substitution of detection devices should only be allowed after proper research has been conducted to ensure the device is permitted by NFPA Standards and Fire Code requirements. Documentation indicating the repairs to the facilities fire alarm system and the devices or detectors replaced should be obtained by fire prevention personnel and filed with the facilities inspection program file.

On-going false alarms and failure of facilities to properly maintain their fire alarm systems should be handled through either the issuance of citations, fines or court actions being sought against the facilities. Many municipal or county jurisdictions have implemented False Alarm Ordinances to “fine” facilities failing to adequately maintain their alarm systems and to recoup cost involving multiple fire department responses.

Fire alarm systems are installed in occupancies to promptly detect the presence of fire, alert building occupants in a timely manner to evacuate the premises, initiate protective devices (close fire doors) and notify the fire department to respond to the occupancy. Fire department responses to occupancies during fire alarm activations involve multiple apparatus with numerous personnel aboard. Unnecessary responses due to false alarms needlessly endanger fire department personnel and the general public. Measures taken to reduce or eliminate false alarms are essential to accomplish the fire department's mission to "Save Lives and Conserve Property".

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