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NOTE

Automatic Fire Protection System Impairment Program

OVERVIEW OF ISSUE

The majority of the healthcare facilities in Canada are equipped with automatic fire protection systems such as sprinklers, pre-action sprinklers, fire pumps, underground water mains, suction tanks, foam-water systems and chemical or gaseous fire suppression systems. Over time, these systems need to be taken out of service ("impaired") for testing, maintenance, repairs, building expansions and upgrades. Impairment occurs when these systems or a section of them are taken out of service or their automatic operation is shutoff for any length of time. Fire protection impairments increase the potential for a significant fire loss. Shutting systems off without taking all necessary precautions or for longer than needed, increases the potential for fire damage in facilities and is therefore a threat to patients' and staff safety. There are many documented cases where these systems are mistakenly not returned to service. Using a formal impairment management program that requires the use of permits/tags is essential.

KEY POINTS

- A formal program to adequately monitor and manage automatic fire protection system impairments is critical in controlling the risk of fire in a healthcare facility.

THINGS TO CONSIDER

Prior to Impairing the System

- Establish who is responsible for the automatic fire protection system impairment program. All impairment permits must be reviewed, approved and signed by the responsible staff (preferably Facilities Supervisor or Manager) before commencement. The approving staff should be familiar with the fire protection system and the affected area. **Never leave this as the sole responsibility of an outside contractor.**
- If possible, plan to do the work when the facility or area affected is not occupied.
- Limit the number and scope of impairment(s) as much as possible. Multiple systems impaired at the same time can result in an unnecessarily large exposure.
- Prepare everything needed before impairing the fire protection (e.g. digging equipment, pipe plugs, repair parts and personnel). Work without interruption until the job is completed to minimize impairment duration.
- Identify which control valve(s) will be closed and attach the impairment tag. Attach the tag to the fire pump if it is to be set in manual mode or turned off for the work. Additional tags may be needed for other locations for adequate notification.
- Notify your emergency response team, fire department, alarm monitoring station and if required, insurance carrier of the impairment (e.g. those using FM Global's Red Tag Permit System should contact FM's customer service desk).
- Prohibit smoking in the affected area.
- **Strictly prohibit** hot work and shut down other hazardous operations (e.g. cutting, welding, bulk ignitable liquid/fuel transfer, etc.) in the affected area.
- If hot work is absolutely essential to complete the work, discuss with your emergency response team, risk management team and fire department. Use a hot work permit system. Remove combustible material from the affected area. Assign a fire watch to patrol the area where protection is impaired.
- If fire protection equipment can be restored, determine how quickly it can be returned to service in case a fire occurs during the impairment.

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- Plan to have temporary protection on hand such as extra fire extinguishers, fire hose laid out (review any trip hazard that may be created) and if possible, temporary sprinkler protection (e.g. cross-feeding of sprinkler systems using 2½ inch hose and coupling or hydrant connected to the sprinkler riser).

During the Impairment

- When closing the fire protection control valve, count the number of turns. This number should be the same as the number of turns to open upon system restoration. **Note:** if the number of turns to open is less than the number of turns to close, then the valve is not yet fully open (this has to be checked) and if it is larger, then the valve was originally partially closed (this should be investigated to prevent recurrence).

Restoring the System

- Promptly restore fire protection equipment to automatic service as soon as possible. Remove any impairment tags attached to the system.
- If sprinkler protection was impaired, conduct a 50-mm (2-in) drain test at the sprinkler riser to obtain a clear, unobstructed water flow. The pressure will drop slightly when the valve is opened and should stabilize shortly after. A slow continuous decline in pressure may indicate a control valve is not fully reopened or the supply pipe is partially obstructed and should be investigated. If the pressure drops to zero, this indicates a shut valve or complete obstruction.
- Reset the alarm system and notify the alarm monitoring section/station/company.
- Lock sprinkler control valves in the wide-open position and document steps taken to restore the fire protection system, as applicable:
  - Actual date/time the sprinkler control valve was operated;
  - Number of turns to fully open the sprinkler control valve;
  - Actual date/time the fire pump was switched back to automatic mode.
- Notify your emergency response team, fire department and insurance carrier, as required.
- Confirm the impairment is concluded with the person who issued and/or approved the permit.

Emergency/Unplanned Impairments

- Stabilize the situation and initiate the above precautions, as quickly as feasible.
- If a fire starts, make sure sprinkler valves are opened immediately (unless the lines are open).
- If it is safe to do so, immediately dispatch the sprinkler valve operator(s) to the valve controlling the fire area; the valve operator's responsibility is to:
  - Unlock the valve, test it to make sure it is fully open and then relock it;
  - Stand by the valve during the fire and close it only at the direction of the Fire Chief (preventing premature closing);
  - Stand by the valve after the fire until sprinklers have been replaced – doing so will allow you to restore the system quickly if the fire reignites;
  - Reopen the valve(s), conduct drain test(s) and lock the valve(s) wide open.

REFERENCES

- FM Global. (2007). Managing fire protection impairment.
- National Fire Protection Association. (2014). Standard for the inspection, testing, and maintenance of water-based fire protection systems. [NFPA 25].

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