Fire Protection System Impairment Management

TOKIO MARINE INSURANCE GROUP

An uncontrolled fire can be extremely damaging to commercial building or industrial building, and while a fire protection system is designed to detect, control or suppress a fire, impairments are an inevitable part of such fire protection system's life cycle, so it is essential that an impairment of the fire protection system, even for a short duration, should be properly managed.

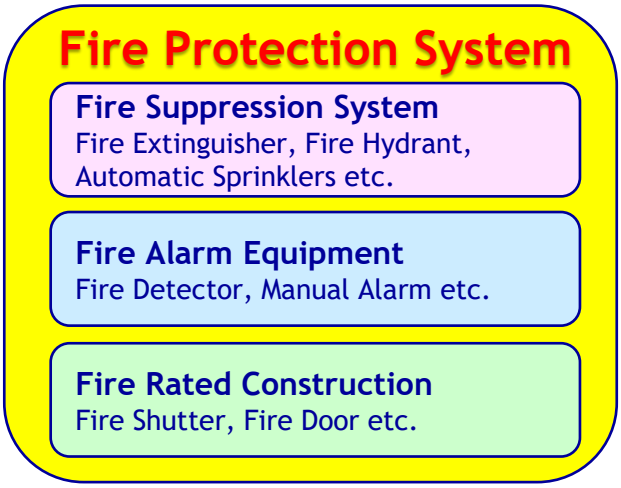
An impairment is any time that the fire protection system is out of service or unable to operate to the full extent of its intended design. During an impairment, the chances of a fire developing and causing major damage is greatly increased.

1. Fire Protection System Impairment Management

Basically, the purposes of having a fire protection system impairment management in place are to:

- ❑ Supervise the safe shutdown of fire protection system such as sprinkler system
- ❑ Control potential fire hazards during the impairment
- ❑ Minimize the duration of the impairment by reinstating the fire protection system as soon as possible

The goal of having a fire protection system impairment management in place is to minimize the risk of a fire developing and spreading during an impairment while maintenance, repairs, system upgrade and tests are performed.



2. Types of Impairments

As observed during some of our risk surveys, some of the common impairment cases encountered include:

- ❑ the maintenance personnel forgot to open the closed sprinkler valve after maintenance,
- ❑ a fire pump taken out-of-service,
- ❑ fire alarm devices by-passed due to trouble signals or faults on the system.

As there are many cases as described above, Impairment Management is very important.

There are basically three types of impairments: planned, emergency and hidden:

- ❑ A planned impairment is any situation in which all or part of the fire protection system is shut down for activities such as maintenance or tests etc., which have been planned in advance. Planned impairments are routine and allow ample time for taking precautions.
- ❑ An emergency Impairment is any situation in which all or part of the fire protection system is out of service due to an unexpected occurrence, such as fault in the fire alarm system or sudden failure of a fire pump.
- ❑ A hidden impairment is one which is not known to exist and is therefore the most serious type. This becomes an emergency impairment when it is recognized through inspection.

3. Roles & Responsibilities During Impairments

Commonly, there are two primary roles needed to manage and properly control the entire impairment.

A. Impairment Supervisor

- ❑ Is a supervisory-level company employee (not a contractor), probably responsibilities going to a safety manager.
- ❑ Implement and manage the fire protection system impairment program.
- ❑ Take care of scheduling planned impairments and implementing the plan during unplanned impairments.
- ❑ Responsible for notifying all relevant personnel, departments and agencies of the impairment, including the fire watcher.

Source: Shutterstock

B. Fire watcher

- ❑ To work with the impairment supervisor to ensure that conditions during the impairment are as safe as possible, and to report any unsafe conditions to the impairment supervisor such as the facility manager.
- ❑ Is in charge of and should be fully trained on using temporary fire protection, such as fire extinguishers and water hoses, which they should keep at the ready in the area with the impairment for the duration of the impairment.
- ❑ He should be very familiar with the impairment program, the facility and the procedures related to sounding a fire alarm.

4. Impairment Procedures

Regardless of the impairment category, the core parts of an effective procedure are as follows:

A. Minimize Hazards

Hazards should be minimized by reducing or completely stopping hazardous operations, activities or maintenance operations. The examples which follow will depend on a case-by case basis and applicable only if possible:

- ❑ Eliminate heat-producing processes and sources.
- ❑ Discontinue use and transfer of flammable liquids into buildings if the fire protection system is out of service.
- ❑ Suspend cutting and welding or similar hot work.
- ❑ Schedule planned impairments during off hours or weekends when production hazards are reduced.

B. Provide Temporary Protection

Provide temporary safeguards when protection is impaired. Some examples include:

- ❑ Bring extra portable fire extinguishers to the area whereby fire detection system is under maintenance.
- ❑ Use a fire hose that is pre-connected to hydrants and stretched into affected areas whereby the sprinklers system are under maintenance and there is high risk of fire.

C. Expedite Repairs

Reduce the minimum amount of downtime of the fire protection system by having replacement parts on hand and workers ready before the system is shut down.

For example, by providing a spare portable fire extinguisher can prevent the impairment of fire extinguishers under replacement by a contactor, whereby the pressure of these fire extinguishers maybe insufficient.

D. Notify the Related Parties

It is necessary that the Impairment Supervisor such as the safety officer notify the related employees in company when impairments occur.

In addition, it is necessary to notify local fire authorities depending on the local authorities' rules and regulations.

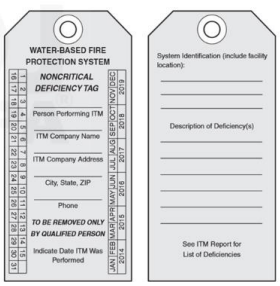
E. Intensify Employee Patrols or Fire Watches

In some cases even if during planned impairments, whereby there are faults in the detection system such as a fire alarm system, it is necessary to provide substitute methods for prompt detection of a fire or a dangerous condition such as providing a continuous fire watch in the impaired area until the original system is completely restored.

F. Use a Tag System

The purpose of the Tag System is to manage the fire protection system during impairments. This system is intended use, by management and maintenance staff to manage reliable restoration work.

For example, attach impairment tag to impaired system (e.g., sprinkler valve shut off during repair) such as to make employees and fire department personnel aware the fire protection system is out of service (which could be fully or partially out of service) and precautions need to be taken. Restoration of the system will resume after the impairment is over.



Source: NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

G. Restoration after the impairment

- ❑ Verify the fire protection system is operational.
- ❑ The Impairment Supervisor needs to notify the related employees that the system has been restored. The local fire authorities also needs to be notified as well, depending on the local authorities' rules and regulations.

5. Key points for Performing Impairment Management

It is important that:

- ❑ Full support from senior management
- ❑ Written procedures should be updated periodically and when necessary.
- ❑ Preparations to make and precautions to be taken before, during and after an impairment
- ❑ The appointment of the necessary trained personnel to be in-charge during an impairment
- ❑ Restore the fire protection system to service as soon as possible

6. Conclusion

If a fire protection system fails to perform as intended during a fire because it is impaired, that is not equipment failure.

Impairment procedures, along with all other precautions, attempt to remove the human element failure potential.

Hence, it is important to have proper impairment management in place along with periodic inspection and should be taken just as seriously as any other safety procedure.

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