

# Managing Fire Protection System Impairment







**C**an your company afford to lose US\$3.2 million in assets? Forgetting to restore an impaired sprinkler or other fire protection system at your facility could cost that much—or more.

Should a fire occur while the system is impaired, the fire quickly could grow undetected and spread beyond the control capabilities of the protection system.

#### Loss Example 1:

A sprinkler system was shut down after a small fire at a manufacturing facility was thought to have been extinguished by sprinklers and hose streams applied by company

employees. The sprinkler system was not restored promptly and the local fire service was not notified of the fire. The fire rekindled and spread beyond the capabilities of the sprinkler system even though employees reopened the sprinkler system's shut valve as soon as the fire was discovered. The resulting damage was estimated at more than US\$84 million gross.

From 1986 to 2005, shut sprinkler valves were a factor in 229 fire losses insured by FM Global, causing more than US\$739 million\* gross in damage—an average of more than US\$3.2 million per incident. All the events, which resulted in a large loss to our clients' assets, could have

*\*Indexed to 2006 dollars*

been prevented with a strong impairment management program, such as FM Global's *Red Tag Permit System*.

In fact, further investigation of these events revealed that sprinkler control valves had been closed for the following reasons:

- Sprinkler system installation
- Sprinkler system repair
- Building alteration
- Maintenance
- Lack of heat in the protected area

However, every time you take your fire protection equipment out of service, even for a minute, you create a fire hazard. Sure, making repairs, installing new equipment or completing building alterations are among valid reasons for impairing protection.

But, the fact remains: If a fire ignites in an area where the fire protection system has been impaired, the fire can spread unabated. As a result, it's important to take quick and efficient steps to minimize the duration of the impairment and implement temporary measures to help prevent a loss from occurring while protection is out of service.

Fortunately, there are a number of steps you can take to ensure your facility's fire protection system is ready when you need it, and following FM Global's *Red Tag Permit System* is top on the list. Designed to help you manage

impairments and restore full fire protection, this program comprises four key elements:

- A. Red Tag Permit
- B. Fire Protection Equipment Decals
- C. Reusable Impairment Tag for Fire Service Connections
- D. Red Tag Permit System Wall Hanger

The following guidelines require the use of FM Global's Red Tag Permit System Wall Hanger (P7427), which includes:

- One copy of this brochure
- One sheet of Fire Protection Equipment Decals (P7834) to affix to fire protection equipment as a reminder that authorization is needed before any shutdown can occur
- One 12.5 x 13.25-in. (31.75 x 33.66-cm) wall hanger with pockets to keep other elements of the system organized and within reach; also lists steps to take before, during and after an impairment
- Four Red Tag Permits (F2480) to authorize impairments and document tasks as they are performed
- One Reusable Impairment Tag for Fire Service Connections (P7427t) to wire to fire service connections as a reminder that fire protection is out of service.

Be sure to familiarize personnel with this system as soon as possible before planning your next fire protection system impairment. Display the wall hanger where it is clearly visible and alert personnel to its location. Educate staff about all procedures and let them know who is assigned to authorize an impairment.

## Red Tag Permit System

A. Red Tag Permit (F2480)

B. Fire Protection Equipment Decals (P7834)

C. Reusable Impairment Tag for Fire Service Connections (P7427t)

D. Red Tag Permit System Wall Hanger (P7427)





## Before a Planned Impairment

- Complete all applicable sections of the permit (see page 5), providing key information, such as telephone numbers for your local fire service, alarm company, water department, and FM Global office servicing your property.
- Affix the red-and-white *Fire Protection Equipment Decals* to all protection equipment to remind personnel that authorization is needed before any shutdown can occur.

- Plan to work on fire protection when the facility is not operating. Shut down any hazardous processes.
- Prohibit any process with an inherent ignition source, such as hot work. Smoking also should be prohibited.
- Be prepared. Have everything ready before impairing protection, e.g., excavating equipment, pipe plugs, repair parts and personnel.
- Plan to have temporary fire protection on hand: extra extinguishers, charged hose lines, temporary sprinkler protection, etc.

- Set up temporary sprinkler protection, especially for prolonged impairments, by running a 2.5-in. (65-mm) hose from the hydrant to the 2-in. (50-mm) drain of an active system (you will need an adapter to connect the hose to the drain).
- Notify your emergency response team (ERT) and the public fire service so they can be ready to handle any emergency that might occur.
- If fire protection equipment can be restored, determine how to quickly return it to service in case a fire occurs during the impairment.
- Assign a fire watch to patrol the area where protection is impaired.
- Notify your local FM Global office of the planned impairment. (For the FM Global office closest to you, visit our Web site at [www.fmglobal.com/contact](http://www.fmglobal.com/contact).) An engineer and/or client service representative can advise you on how to proceed and follow up until protection has been restored. In addition, he or she can help minimize downtime, if possible, reduce fire exposure to the area, arrange for temporary protection, and determine how to restore protection as quickly as possible in the event of a fire.

## Completing the Red Tag Permit

The precautions listed at the top of all three parts will help you and your FM Global engineer determine the specific actions you need to take. The information provided in Part 1 transfers to Parts 2 and 3.

RED TAG PERMIT	
CONTROL NUMBER	INDEX NUMBER
<b>PRECAUTIONS TAKEN (CHECK AS APPROPRIATE)</b> <input type="checkbox"/> Emergency Operations Suspend <input type="checkbox"/> Public Fire Department Notified <input type="checkbox"/> Hazardous Operations Stopped <input type="checkbox"/> Hot Work Prohibited <input type="checkbox"/> Smoking Restricted <input type="checkbox"/> Other: _____ <input type="checkbox"/> Continuous Work Authorized <input type="checkbox"/> Draining Period of Area <input type="checkbox"/> Hydrant Connected to Sprinkler Riser <input type="checkbox"/> Pipe Plugs on Hand <input type="checkbox"/> Fire Hose Laid Out	
INSURED NAME	
INSURED LOCATION (City, State/Province)	
INSURED PHONE NO.	INSURED FAX NO.
CHECK IF <input type="checkbox"/> SPRINKLER <input type="checkbox"/> FIRE PUMP <input type="checkbox"/> CITY <input type="checkbox"/> HALON <input type="checkbox"/> OTHER	SPRINKLER VALVE LOCATION/NUMBER  AREA PROTECTED  REASON FOR IMPAIRMENT
PLANNED DATE/TIME TO BE CLOSED PLANNED DATE/TIME TO BE OPEN NAME/TITLE OF RESPONSIBLE PERSON (PRINT)	
AUTHORIZED BY (PRINT NAME)	FIRE PROTECTION EQUIPMENT OPERATOR (PRINT NAME)
<b>PART 1 INSTRUCTIONS</b> Firesafety Supervisor: Fill out using ball-point pen, sign and issue permit as follows: Phone Part 1 information or fax this part to the FM Global number listed on the Red Tag Permit Wall Kit. Place Part 2 in center pocket of Wall Kit as visual reminder of impairment. Issue Part 3 (Red Tag) to Fire Protection Equipment Operator to attach to impaired equipment.	
<b>RED TAG PERMIT</b> Part 1 of 3 <small>2400 (16-01) ENG PRINTED IN USA ©2002 Factory Mutual Insurance Company. All Rights Reserved.</small>	

### Part 1 – Red Tag Permit

This section becomes a record of the impairment. The firesafety supervisor completes, signs and issues the permit, describing the location of the facility and reason for impairment, and then:

1. Phones or faxes the same information to FM Global (FM Global telephone and fax numbers are included on the wall hanger); and
2. Signs the permit to document that the impairment has been planned or is underway.

OUT OF SERVICE	
CONTROL NUMBER	INDEX NUMBER
<b>PRECAUTIONS TAKEN (CHECK AS APPROPRIATE)</b> <input type="checkbox"/> Emergency Operations Suspend <input type="checkbox"/> Public Fire Department Notified <input type="checkbox"/> Hazardous Operations Stopped <input type="checkbox"/> Hot Work Prohibited <input type="checkbox"/> Smoking Restricted <input type="checkbox"/> Other: _____ <input type="checkbox"/> Continuous Work Authorized <input type="checkbox"/> Draining Period of Area <input type="checkbox"/> Hydrant Connected to Sprinkler Riser <input type="checkbox"/> Pipe Plugs on Hand <input type="checkbox"/> Fire Hose Laid Out	
INSURED NAME	
INSURED LOCATION (City, State/Province)	
INSURED PHONE NO.	INSURED FAX NO.
CHECK IF <input type="checkbox"/> SPRINKLER <input type="checkbox"/> FIRE PUMP <input type="checkbox"/> CITY <input type="checkbox"/> HALON <input type="checkbox"/> OTHER	SPRINKLER VALVE LOCATION/NUMBER  AREA PROTECTED  REASON FOR IMPAIRMENT
PLANNED DATE/TIME TO BE CLOSED PLANNED DATE/TIME TO BE OPEN NO. OF TURNS TO CLOSE NO. OF TURNS TO OPEN 2 in. DRAIN TEST PERFORMED <input type="checkbox"/> YES <input type="checkbox"/> NO NAME/TITLE OF RESPONSIBLE PERSON (PRINT)	
AUTHORIZED BY (PRINT NAME)	FIRE PROTECTION EQUIPMENT OPERATOR (PRINT NAME)
<b>PART 2 INSTRUCTIONS</b> Firesafety Supervisor: Place in center pocket of Red Tag Permit Wall Kit as a visual reminder of present impairment. When fire protection is restored and Red Tag is returned by Fire Protection Equipment Operator, transfer information needed to this part and phone the information or fax this part to the FM Global number listed on Wall Kit. Please send more permits. Quantity if needed: _____ Mail to (Name): _____ (Address): _____	
<b>RED TAG PERMIT</b> Part 2 of 3	

### Part 2 – Out of Service

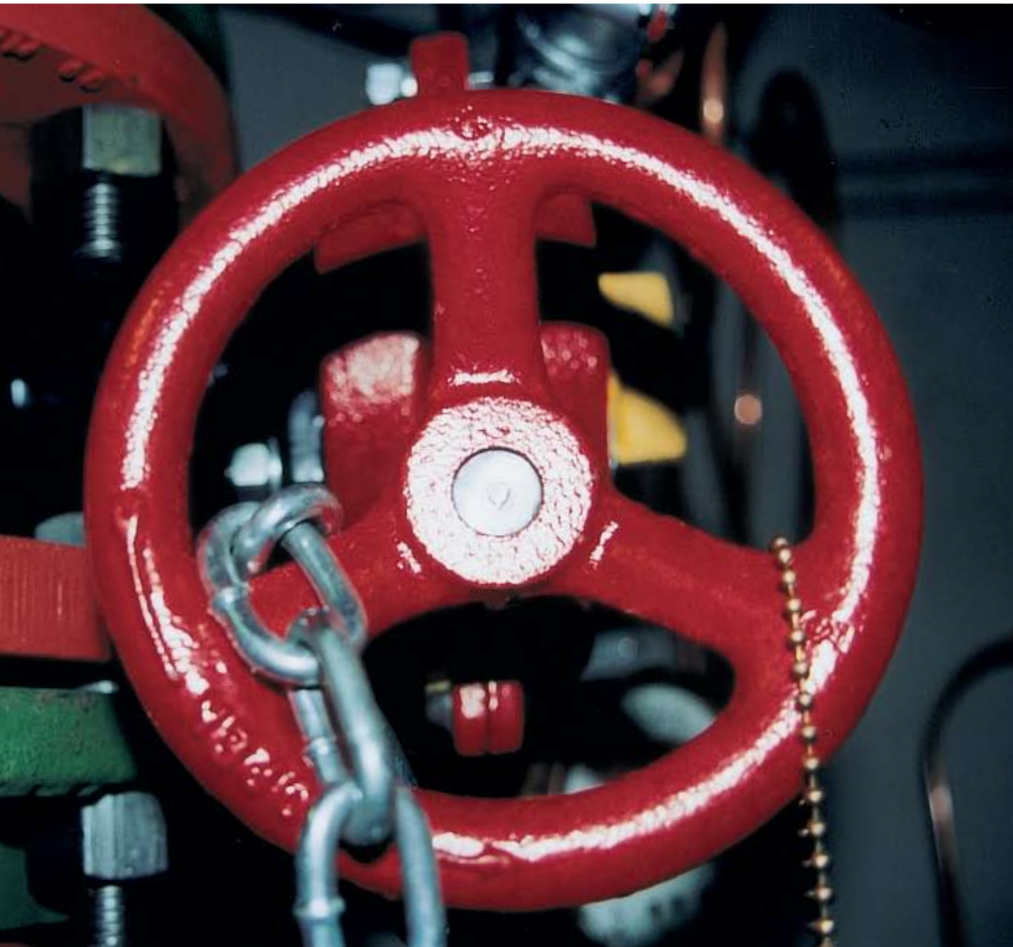
Place Part 2 in the center pocket of the wall hanger as a reminder of the impairment.

FIRE PROTECTION OUT OF SERVICE	
CONTROL NUMBER	INDEX NUMBER
<b>PRECAUTIONS TAKEN (CHECK AS APPROPRIATE)</b> <input type="checkbox"/> Emergency Operations Suspend <input type="checkbox"/> Public Fire Department Notified <input type="checkbox"/> Hazardous Operations Stopped <input type="checkbox"/> Hot Work Prohibited <input type="checkbox"/> Smoking Restricted <input type="checkbox"/> Other: _____ <input type="checkbox"/> Continuous Work Authorized <input type="checkbox"/> Draining Period of Area <input type="checkbox"/> Hydrant Connected to Sprinkler Riser <input type="checkbox"/> Pipe Plugs on Hand <input type="checkbox"/> Fire Hose Laid Out	
INSURED NAME	
INSURED LOCATION (City, State/Province)	
INSURED PHONE NO.	INSURED FAX NO.
CHECK IF <input type="checkbox"/> SPRINKLER <input type="checkbox"/> FIRE PUMP <input type="checkbox"/> CITY <input type="checkbox"/> HALON <input type="checkbox"/> OTHER	SPRINKLER VALVE LOCATION/NUMBER  AREA PROTECTED  REASON FOR IMPAIRMENT
PLANNED DATE/TIME TO BE CLOSED PLANNED DATE/TIME TO BE OPEN NO. OF TURNS TO CLOSE NO. OF TURNS TO OPEN 2 in. DRAIN TEST PERFORMED <input type="checkbox"/> YES <input type="checkbox"/> NO NAME/TITLE OF RESPONSIBLE PERSON (PRINT)	
AUTHORIZED BY (Signature)	FIRE PROTECTION EQUIPMENT OPERATOR (Signature)
<b>PART 3 INSTRUCTIONS</b> Fire Protection Equipment Operator: Write the date, time and number of turns needed to close the sprinkler control valve and fasten the Red Tag to the shut valve. When the impairment is over reopen the valve. Perform a 2 in. drain test. Write the reopening information on this Red Tag and return it to the Firesafety Supervisor. If equipment is other than sprinklers, return equipment to automatic service when the impairment is over. Firesafety Supervisor: Retain this copy in your Wall Kit or other permanent file when impairment is over.	
<b>RED TAG PERMIT</b> Part 3 of 3	

### Part 3 – Fire Protection Out of Service

Issue Part 3 to the fire protection equipment operator, who then documents each step in the impairment and return-to-full-operation processes, and attaches Part 3 to the shut valve. Be sure he or she carefully records the date, time, type of valve and the number of turns needed to close it.





## Authorizing the Impairment

- Inform employees that the *Red Tag Permit System* is in effect. It's best if the wall hanger is displayed in plain view so that the firesafety supervisor or appropriate personnel can easily follow the procedures listed on the poster and permit.
- Use the three-part *Red Tag Permit* to initiate the impairment and identify affected equipment. Complete the permit, following each step carefully.

## Restoring the System

- Promptly restore fire protection equipment to automatic service as soon as possible.
- If sprinkler protection was impaired, conduct a 2-in. (50-mm) drain test at the sprinkler riser to obtain a clear, unobstructed water flow.
- Lock sprinkler control valves in the wide-open position.
- Reset the alarm system; notify the central station, if applicable.

- Notify your ERT, public fire service and FM Global representative that fire protection has been restored.
- Complete the *Red Tag Permit*. The fire protection equipment operator documents all steps taken to restore fire protection in Part 3 of the permit, signs it and returns it to the firesafety supervisor. The firesafety supervisor:
  - Reviews the information on the signed permit and retains it as a record of the impairment; and
  - Transfers information from Part 3 of the permit to Part 2, and phones or faxes the information in Part 2 to FM Global.

## Managing Unplanned Impairments

The steps outlined on the previous pages work well for planned fire protection impairments; however, not all impairments can be planned. Suppose sprinkler piping starts leaking or freezing causes pipes to break? Suddenly, you're faced with an unplanned impairment and the steps you take to manage the situation could mean the difference between minor damage and a significant loss. To ensure safe handling of the impairment:

- Stabilize the situation and immediately follow the precautions outlined in "Before a Planned Impairment" on page 4.
- If a fire starts, make sure sprinkler valves are opened immediately.

- If it is safe to do so, immediately dispatch the sprinkler valve operator(s) to the valve(s) controlling the fire area; the valve operator's job is to:
  - Guard the valve against premature shutting;
  - Unlock the valve, test it to make sure it is open, and then relock it;
  - Stand by the valve during the fire and close it only at the direction of the fire chief;
  - 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; and
  - Reopen valve(s), conduct drain test(s) and lock the valve(s) wide open.

*Remember:* If someone forgets to reopen an impaired fire protection valve and a fire breaks out, the result could be a devastating loss to your company and its assets, regardless of whether or not attempts are made to immediately reopen the valve or extinguish the flames.



## Additional Resources



For additional information on managing impairments, refer to FM Global's online Resource Catalog available at [www.fmglobalcatalog.com](http://www.fmglobalcatalog.com). There, you will find educational material offered in a wide variety of languages and formats, including information on FM Global's online training courses developed exclusively for our clients. Of particular interest will be *Managing Impairments Using FM Global's Red Tag Permit System*, which provides instruction on impairments to fire protection equipment/systems and how to use FM Global's *Red Tag Permit System* to properly manage those impairments. Available exclusively to FM Global clients, the course takes less than one hour to complete.



**One shut sprinkler valve and five minutes.**

That's all it takes for fire to destroy your facility.

**What can YOU do?**

Visit [training.fmglobal.com](http://training.fmglobal.com) for online training.



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