

# Inspection and Testing Program Fire Protection Equipment

## I. Introduction

Emergencies seldom give warning before they strike. Thus, it is essential that fire protection equipment be inspected, tested, and maintained to be certain it is operable at all times. Management, therefore, should establish an effective equipment inspection program.

### A. Statement of Problem

Fire protection equipment, like all other equipment, deteriorates with time. It is also vulnerable to external influences such as corrosive environments, tampering, accidental damage, and careless use. Further, since fire protection equipment is used infrequently, it must be inspected and tested regularly to prove its reliability and operability. It is far better to detect an unsatisfactory condition prior to an emergency than it is to discover it during the emergency.

### B. Action Plan

A fire protection equipment inspection is intended to determine equipment operability and should be performed as outlined in this section. In order to set up an effective program, management shall:

1. Appoint a qualified individual to monitor the program and report to management.
2. Select and train individuals with appropriate mechanical aptitude to conduct the inspections and tests of fire protection equipment.
3. Initiate a complete survey of the facility's fire protection equipment for the purpose of developing a customized inspection report form. Examples of forms are attached.
4. Establish effective procedures for reviewing the inspection reports.
5. Initiate prompt action to correct any noted deficiencies.
6. Establish contacts with sprinkler contractors for periodic testing and emergency maintenance of fire protection equipment.

### **C. Background**

Once the qualified persons are selected, it is important that they be properly trained. This training should include the following features:

1. Review of existing protection equipment and its maintenance, operation, and testing techniques, and familiarization with installed fire protection equipment.
2. Making copies of manufacturers' instruction manuals and other data available in a centralized training file.

## **II. Elements of an Effective Self-Inspection Program**

### **A. Trained Staff Designated to Establish and Implement the Program**

The responsibility for supervision of fire protection systems rests with the Facilities Manager and designated personnel responsible for the equipment. Employees responsible for system supervision should be familiar with fire protection equipment and know how to operate equipment during an emergency (verify necessary sprinkler control valves are open in the fire area, know how to start and maintain fire pumps, etc.). If your facility has several sprinkler systems, it is important that an up-to-date sketch be maintained showing the location of sprinkler control valves. Proper inspection records should be maintained.

Alternate personnel should be available to make fire prevention inspections when the designated individual is ill or on vacation. Local management should support prompt repair of equipment when deficiencies are noted.

If maintenance staff is not available and the services of a contractor are to be used to perform maintenance and tests, the contractor should furnish a written report. The report should include completed self-inspection forms. An employee should accompany the contractor during the test to become familiar with the equipment in the event equipment must be operated during an emergency.

### **B. Locking Sprinkler Control Valves**

All fire protection system control valves shall be locked in the open position. Locks and chains should be sturdy and resistant to breakage, except by heavy bolt cutters. Breakaway and combination locks shall not be used. Distribution of keys should be kept to a minimum and keys should be restricted to only those directly responsible for maintaining the fire protection systems.

### **C. Self-Inspection Forms**

Since the number, type, and complexity of fire protection systems will vary depending on the size of your facility, customized self-inspection forms are needed for sprinkler

control valves, portable fire extinguishers, fire pumps, dry pipe valves, etc. Such forms not only serve as a guide for conducting inspections, but also provide a method of proper record keeping. The inspector should carry the form and use it as a checklist. It should be filled in as rounds are made, not after the completion of an inspection. **A sample form is provided at the end of this section.**

### **D. Marking and Identification of Equipment**

Sprinkler control valves should be numbered for inspection and identification purposes. The number listed on the valve should correspond with the number on the inspection form and fire diagram.

Valves should be plainly marked with the direction to open. If not marked by the manufacturer, a sign should be posted near the valve indicating direction to open. If underground curb box valves are used, a T wrench should be provided near the valve with a sign indicating location of the valve.

### **E. Frequency of Inspection**

The frequency of inspection of fire protection equipment depends on numerous factors. For example, dry pipe systems should be checked daily in the winter; but less frequent checks would be acceptable in the summer. The recommended frequency for testing and maintenance of critical sprinkler system components appears on the attached schedule.

## Fire Protection Testing and Inspection Schedule

**Valves** All fire protection control valves (OSY - PIV - Butterfly) shall be locked and chained in the open position.

All valves shall be visually inspected on a monthly basis to show they are open and are not blocked.

All valves shall be exercised. Manually close and manually reopen every 6 months. Lubricate as needed.

**Fire Pump** All fire pumps shall be started weekly by drop of pressure and allowed to run for five minutes before placing back in automatic position (churn test).

All fire pumps shall be tested annually with a full flow test measuring waterflow and pressure. (Qualified sprinkler company should perform the test). Test results should be kept on file for review.

**Alarms:** The following testing frequency shall be used for alarms:

Waterflow	Quarterly
Valve Tamper	Quarterly
Low Air	Quarterly
Pump Running	Weekly
Electric Power to Pump (Electric Pump)	Monthly
Detectors (Smoke and Heat)	Annually

**Dry Pipe Valves** All dry pipe valves shall be tripped annually, with test results kept on file for review.

**FM-200** Annual contractor service

**Anti-Freeze Concentration** Annual test

**Outside Local Waterflow Alarms** Quarterly

## Fire Protection Testing and Inspection Schedule

### **Private Hydrant and Underground Flush**

Annual flush shall be performed.

### **Extinguishers**

Visually check monthly each extinguisher to confirm they are charged, in place, and not blocked.

Annual service by qualified extinguisher company.

### **Inside Hose Connections**

Visually check monthly to confirm they are in place and not blocked.

### **Automatic Sprinkler Systems**

Contract with qualified sprinkler contractor for annual service and testing program.

### **2-inch Drain Test**

Quarterly test of 2-inch drain on all risers. Record both static and residual pressures with valve completely open.

Note: Cold weather may dictate this test be postponed due to creating icy conditions outside building near drainpipe.

However, test sheet must be noted that test was not completed due to cold weather.

### **Hydrants**

Monthly visual check for accessibility and condition.





# FIRE PREVENTION INSPECTION REPORT

PLANT _____	LOCATION _____	DATE _____
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## FIRE PROTECTION VALVES *(List all inside and outside)*

VALVE NUMBER	VALVE LOCATION/AREA CONTROLS	OPEN	LOCKED	SHUT

Were any sprinkler valves operated since last inspection?     YES     NO    If yes: \_\_\_\_\_

Why was valve shut? \_\_\_\_\_ Was management notified? \_\_\_\_\_

**PUBLIC WATER**

Public water supply in service?     YES     NO    Pressure \_\_\_\_\_ PSI

**WATER SUPPLY TANKS & RESERVOIRS**

TYPE SUPPLY	HEATER WORKING		WATER LEVEL FULL		Comments _____
	YES	NO	YES	NO	

*Water level of tanks should be checked by overflow*

**FIRE PUMPS**

TYPE PUMP	SET FOR AUTO START		STARTED AUTO		OPERATED PROPERLY		CHECKLIST COMPLETED		WATER PRESURE WITH PUMP RUNNING	Comments _____
	YES	NO	YES	NO	YES	NO	YES	NO		
									PSI	
									PSI	

If engine driven pump, is fuel supply at least 3/4 full?     YES     NO

**SPRINKLER SYSTEMS *(wet, dry, deluge, pre-action)***

SYSTEM NUMBER	WATER PRESSURE		AIR PRESSURE		HEAT ADEQUATE		ALARM TESTED		COMMENTS
	STATIC	FLOWING 2" DRAIN	VALVE	ACCELERATOR	YES	NO	YES	NO	

Storage within 18 inches of sprinkler heads?     YES     NO    \_\_\_\_\_

Sprinkler heads painted/loaded/corroded?     YES     NO    \_\_\_\_\_

Additional comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# FIRE PREVENTION INSPECTION REPORT

## SPECIAL EXTINGUISHING SYSTEM (Halon, Dry Chemical, etc.)

TYPE SYSTEM	LOCATION	IN SERVICE		DATE LAST SERVICED	Comments
		YES	NO		

## FIRE EXTINGUISHERS, INSIDE HOSE STATIONS, AND STANDPIPES

	IN SERVICE		ACCESSIBLE		PROPER TYPE		PROPER ARRANGE/COND.		Comments
	YES	NO	YES	NO	YES	NO	YES	NO	
	Fire Extinguishers								
Small Hose Stations									
Standpipes									

## HYDRANT, HOSE HOUSES

HYDRANT LOCATION	ACCESSIBLE		DRAINED		EQUIPMENT				Comments
	YES	NO	YES	NO	ADEQUATE		CONDITION SATISFACTORY		
					YES	NO	YES	NO	

## SMOKE/HEAT DETECTORS AND MANUAL PULL STATIONS

IN-SERVICE		TESTED SATISFACTORY		Comments
YES	NO	YES	NO	

## FIRE DOORS

CONDITION		OPERATION		DOORS BLOCKED		DATE LAST TESTED	Comments
SAT	UNSAT	SAT	UNSAT	YES	NO		

## SMOKING

Signs posted in restricted areas?  YES  NO \_\_\_\_\_ Evidence of smoking in restricted areas?  YES  NO \_\_\_\_\_

## FLAMMABLE/COMBUSTIBLE LIQUIDS (Including aerosols)

Stored in proper area?  YES  NO \_\_\_\_\_  
 Stored at proper height?  YES  NO \_\_\_\_\_  
 Handling adequate?  YES  NO \_\_\_\_\_

## MISCELLANEOUS

ITEM	SATISFACTORY	UNSATISFACTORY	Comments
Housekeeping			
Roof Drainage			
Electrical Wiring/Devices			
Cutting/Welding Controlled			
Watch Service			

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

INSPECTOR \_\_\_\_\_ REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

# ELECTRIC FIRE PUMP INSPECTION CHECKLIST

**INSTRUCTIONS:** All fire pumps should be run and tested weekly. During pump operation, record results for each weekly test in the appropriate column for all items listed. If a need for repairs or adjustments is discovered during the weekly testing, they should be made immediately, following the manufacturer's instructions. Always operate pumps for 5 minutes after repairs to insure proper pump operation.

PLANT NAME				LOCATION									
<b>IMPORTANT</b> Any pump that is not left in the automatic start mode at the end of tests is considered impaired. Report this condition to management and begin repairs immediately.													
ITEMS LISTED FOR TESTING	CORRECT READINGS	USE SPACES BELOW TO RECORD TEST RESULTS											
		1ST WEEK	2ND WEEK	3RD WEEK	4TH WEEK	5TH WEEK	6TH WEEK						
1. DATE FIRE PUMP TESTED	Day/Date/Yr												
2. TESTED BY WHOM	Your Initials												
3. MOTOR RUNNING TIME (5 MINUTES WEEKLY MINIMUM - ELECTRICAL)	Length of Run in Minutes	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.	___ min.
4. SUCTION PRESSURE (PSI)													
5. DISCHARGE PRESSURE (PSI)													
6. RPM (AT MAXIMUM SPEED)													
7. PUMP ROOM TEMPERATURE	Min. 40°F	*F	*F	*F	*F	*F	*F	*F	*F	*F	*F	*F	*F
* 8. FIRE PUMP AUTOMATIC START PRESSURE SETTING (PSI)													
* 9. JOCKEY PUMP COMES ON AT (PSI)													
* 10. JOCKEY PUMP SHUTS OFF AT (PSI)													
11. ARE STUFFING BOX GLANDS AT PROPER TIGHTNESS?	SLOW DRIP	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
12. START PUMP BY DROPPING PRESSURE ON PRESSURE SENSING LINE (OPEN PET COCK AND FLOW WATER). DID PUMP START AUTOMATICALLY ON PRESSURE DROP?													
13. DID YOU ACTUALLY OBSERVE SUCTION TANK OVERFLOW TO DETERMINE IF FULL?													
14. WAS THE RUNNING AND POWER OFF PUMP ALARMS TESTED SATISFACTORY TO CENTRAL MONITORING STATION?													
15. WAS PUMP LEFT IN FULLY AUTOMATIC STARTING MODE AT END OF TESTING AND IS GREEN "ON" LIGHT BURNING?													
<b>COMMENTS:</b> Describe the nature of any problems encountered for "NO" answers above and what was done for correction. Also state time and date repairs were completed and pump was returned to complete operating services:													

\* The jockey pump should be set to maintain pressure equal to the fire pump rating plus static suction pressure plus 10 psi. The fire pump should be set to start 10 psi less than the jockey pump start pressure. Refer to NFPA 20, A-11-4 for guidance.

INSPECTOR'S SIGNATURE \_\_\_\_\_ SUPERVISOR'S SIGNATURE \_\_\_\_\_

• FILE FOR REVIEW •

• ATTACH TO FIRE PREVENTION INSPECTION REPORT •

# WEEKLY DIESEL FIRE PUMP INSPECTION CHECKLIST

DATE: \_\_\_/\_\_\_/\_\_\_

**INSTRUCTIONS:** All fire pumps should be run and tested weekly. During pump operation, record results for each weekly test in the appropriate column for all items listed. If a need for repairs or adjustments is discovered during the weekly testing, they should be made immediately, following the manufacture's instructions. Always operate pumps for 5 minutes after repairs to insure proper pump operation.

**IMPORTANT** Any pump that is not left in the automatic start mode at the end of tests is considered impaired. Report this condition to management and begin repairs immediately.

ITEMS LISTED FOR TESTING	CORRECT READINGS	RECORDED RESULTS	WCM #	OPERATOR INITIALS
1. ENGINE RUN TIME. OPERATE ALL INTERNAL COMBUSTION ENGINES FOR AT LEAST 30 MINUTES WEEKLY.	30 Minutes Weekly			
2. PUMP SUCTION PRESSURE ( PSI )				
3. PUMP DISCHARGE PRESSURE ( PSI )				
4. RPM ( AT MAXIMUM SPEED )				
5. OIL PRESSURE - ( SHOULD CONFORM TO MFG. SPEC'S. ) INVESTIGATE PROBLEM AND MAKE REPAIRS IF NECESSARY	RUN PSI			
6. COOLING WATER SUPPLY FOR THE HEAT EXCHANGER	Water Disch. Observed	YES NO		
7. AMP ( RECORD ENGINE GUAGE READING ) AMP READING SHOULD BE +2 TO +5 AMPS AFTER 5 MINUTES RUNNING TIME	+2Amps +5Amps	+ _____ - _____		
8. CONDITION OF BATTERY CHARGER ( SEE ITEM 7 FOR GUIDANCE )	Charging Satisfactory	YES NO		
9. FUEL TANK LEVEL ( KEEP TANK FULL AT ALL TIMES TO PREVENT CONDENSATION )	3/4 Full To Full	YES NO		
10. CHECK OIL STICK TO DETERMINE LEVEL / CONDITION OF CRANKCASE OIL. ADD OIL WHEN LEVEL AT "ADD" MARK.	Oil Stick On "Full" ?	YES NO		
11. PUMP ROOM ( AMBIENT ) TEMPERATURE	Min. 40 Deg. F			
12. WATER AND OIL HEATER FOR ENGINE IS OPERATING	Min. 70 Deg. F	YES NO		
13. COOLING SYSTEM TEMPERATURE	Max. Deg. F			
*14. FIRE PUMP AUTOMATIC START PRESSURE SETTING ( PSI )				
*15. JOCKEY PUMP COMES ON AT ( PSI )				
*16. JOCKEY PUMP SHUTS OFF AT ( PSI )				
17. ARE STUFFING BOX GLANDS AT PROPER TIGHTNESS?	Slow Drip	YES NO		
18. DID PUMP START AUTOMATICALLY ON PRESSURE DROP? ( OPEN PET COCK AND FLOW WATER TO DROP PRESSURE IN SENSING LINE )				
19. ARE BATTERY CONNECTIONS FREE OF CORROSION & TIGHT				
20. DID DIESEL START AUTOMATICALLY ON A & B BATTERIES WHEN TESTED SEPERATELY?				
21. ANTIFREEZE ADEQUATE IN COOLING SYSTEM HEAT EXCHANGER?				
22. DID YOU ACTUALLY OBSERVE SUCTION TANK OVERFLOW TO DETERMINE IF FULL?				

