

3.14 FIRE PROTECTION SYSTEMS

Applicability:

Applies to the operating status of the fire detection instrumentation, fire suppression systems, fire barriers, and to the administrative controls required for a comprehensive fire protection and prevention program. The requirements of these specifications shall apply to an area or areas when equipment in that area or areas is required to be operable as specified by other Limiting Conditions for Operation.

Objectives:

To assure the operability of Fire Protection Systems.

Reports:

Except as specified by the Limiting Conditions for Operation, the reporting requirements of 6.9.2 shall not apply for Fire Protection Systems.

Specification:

3.14.1 Fire Detection and Actuation Instrumentation

- 3.14.1.1 As a minimum, the fire detection and actuation instrumentation for each fire detection zone shown in Table 3.14.1 shall be OPERABLE.
- 3.14.1.2 With the number of operable fire detection and actuation instruments less than required by Table 3.14.1:
 - a. Within one (1) hour, increase the inspection frequency of the zone with the inoperable instrument(s) to at least once per hour, or prepare and submit a thirty-day written report pursuant to 6.9.2.b.
 - b. Restore the inoperable instrument(s) to operable status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.3.g within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the instrument(s) to operable status.

BASIS:

Operability of the fire detection and actuation instrumentation ensures that adequate warning capability is available for prompt detection of fires and provides for the actuation of automatic isolation and suppression systems which protect various safety related areas of the plant. The capabilities are required in order to detect, locate, isolate and extinguish fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

3.14 FIRE PROTECTION SYSTEMS (Continued)

In the event that a portion of the fire detection and actuation instrumentation is inoperable, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is returned to service.

3.14.2 Fire Suppression Water System

3.14.2.1 The Fire Suppression Water System shall be OPERABLE with:

- a. Two high pressure pumps, each with a capacity of 2500 gpm, with their discharge aligned to the yard loop, and
- b. An operable flow path capable of taking suction from the Unit 2 intake structure and transferring the water through distribution piping with operable sectionalizing, control or isolation valves.

3.14.2.2 With less than the above required equipment OPERABLE:

Restore the inoperable equipment to operable status within seven days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.3.g within the next 30 days outlining the plans and procedures to be used to provide for the loss of redundancy in this system.

3.14.2.3 With no Fire Suppression Water System OPERABLE:

- a. Establish a backup fire suppression water system within 24 hours, and provide prompt notification with written followup in accordance with Specification 6.9.2a. The written followup report shall contain information outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status, or
- b. Be in hot shutdown within twelve hours and in cold shutdown within the next 24 hours.

3.14.3 Fire Water Pre-Action System

3.14.3.1 The Fire Water Pre-Action System in the first floor Auxiliary Building hallway above the instrument and service air compressor shall be OPERABLE:

- a. With no visible water leakage from the spray nozzles.
- b. With the air supply to the system operable,
- c. With automatic initiation logic operable, and
- d. With the system aligned to deliver to the protected area.

3.14.3 Fire Water Pre-Action System (Continued)

3.14.3.2 With the Fire Water Pre-Action System in a condition of readiness less than required by the above:

- a. Ensure that backup fire suppression equipment is available within one hour, or prepare and submit a thirty-day written report pursuant to 6.9.2.b.
- b. Restore the system to OPERABLE status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.3.g within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

3.14.4 Fire Hose Stations

3.14.4.1 Each fire hose station in Table 3.14.2 shall be OPERABLE.

3.14.4.2 With a hose station in Table 3.14.2 inoperable, route an additional equivalent capacity hose to the unprotected area from an operable hose station within one hour, or prepare and submit a thirty-day written report pursuant to 6.9.2.b.

3.14.5 CO₂ Fire Protection System

3.14.5.1 The CO₂ Fire Protection Systems for 1) the Diesel Generator Rooms and, 2) North and South Cable Vaults shall be OPERABLE, each:

- a. With a complete bank of fully charged CO₂ cylinders in service,
- b. With the system aligned to deliver to the protected areas, and
- c. With automatic initiation logic operable. For the Diesel Generators, this includes two dedicated heat detectors per room for CO₂ actuation.
- d. A CO₂ cylinder shall be deemed fully charged if it contains not less than 90% of the full charge weight.

3.14.5.2 With any of the CO₂ Fire Protection Systems in a condition of readiness less than required by the above:

- a. Ensure that backup fire suppression equipment is available within one hour, or prepare and submit a thirty-day written report to the Commission pursuant to 6.9.2.b.

3.14.5 CO₂ Fire Protection System (Continued)

- 3.14.5 b. Restore the affected system to OPERABLE status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.3.g within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.
- c. If a diesel generator CO₂ Fire Protection System is inoperable and the affected diesel generator is running, immediately post a continuous fire watch. A continuous fire watch shall be maintained until the CO₂ fire protection system is restored to operability or until the diesel generator has been shut down.

3.14.6 Halon Fire Protection System

3.14.6.1 The Halon Fire Protection System for the Cable Spread Room Emergency Switchgear Room and the Safeguards Room shall be OPERABLE:

- a. With a complete bank of fully charged Halon cylinders in service,
- b. With the systems aligned to deliver to the protected areas, and
- c. With automatic initiation logic operable.
- d. A Halon cylinder shall be deemed to be fully charged if it contains not less than 90% of its full charge pressure and not less than 95% of its full charge weight.

3.14.6.2 With the Halon Fire Protection System in a condition of readiness less than required by the above:

- a. Ensure that backup fire suppression equipment is available within one hour, and prepare or submit a thirty-day written report pursuant to 6.9.2.b.
- b. Restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.2, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.3.g within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

3.14.6 Halon Fire Protection System (Continued)

BASIS

The OPERABILITY of the fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in any portion of the facility where safety related equipment is located. The fire suppression system consists of the water system, CO₂, Halon, and fire hose stations. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety related equipment and is a major element in the facility fire protection program.

In the event that portions of the fire suppression systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the affected equipment can be restored to service.

In the event that the fire suppression water system becomes inoperable, immediate corrective measures must be taken since this system provides the major fire suppression capability of the plant. The requirements for a twenty-four hour report to the Commission provides for prompt evaluation of the acceptability of the corrective measures to provide adequate fire suppression capability for the continued protection of the nuclear plant.

3.14.7 Fire Barrier Penetration Fire Seals

3.14.7.1 All penetration fire barriers protecting safety related areas shall be functional when equipment in those areas are required to be operable.

3.14.7.2 With the penetration fire barrier non-functional:

- a. The operability of the fire detection systems providing coverage for the fire areas on either side of the penetration, as applicable, shall be verified within one hour.
- b. If either of the detection systems are inoperable, a continuous fire watch shall be established on at least one side of the affected penetration within one hour.
- c. If either the actions of a. or b. above are not completed within the required time, prepare and submit a thirty-day written report pursuant to 6.9.2.b.

BASIS

The functional integrity of the fire barrier penetration seals ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire rapidly involving several areas of the facility prior to detection and extinguishment. The fire barrier penetration seals are a passive element in the facility fire protection program and are subject to periodic inspections.

During periods of time when the seals are not functional, verification of fire detection system operability is required to insure that prompt detection capability exists in the vicinity of the penetration barrier. Should an area detection system be inoperable, the fire watch will provide the required protection until the seal is restored to functional status.

TABLE 3.14.1
FIRE DETECTION AND ACTUATION INSTRUMENTATION

<u>FIRE ZONE NO.</u>	<u>ROOM</u>	<u>TRAINS A&B**</u>	<u>TRAIN A*</u>	<u>TRAIN B*</u>
1	Diesel Gen. B.	3	1	1
2	Diesel Gen. A	3	1	1
3	SIS Pump	2		
4	Charging Pump	2		
5	Component Cooling	4		
6	Aux. FW Pump	1		
7	Boron Injection	1		
8	Cable Vault N	1	1	1
9	Cable Vault S	6	1	1
10	Aux. Bldg. Corridor (N) 1st Floor	4		
11	Aux. Bldg. Corridor (Cent.) 1st Floor	4	1	1
12	Aux. Bldg. Corridor (S) 1st Floor	5		

<u>FIRE ZONE</u> <u>NO.</u>	<u>ROOM</u>	<u>TRAINS A&B**</u>	<u>TRAIN A*</u>	<u>TRAIN B*</u>
13	Aux. Bldg Corridor 2nd Floor	5		
14	Battery Room	2		
15	HVAC Equipment	2		
16	Cable Room #2	6	1	1
17	Elect. Equip.	6		
18	Rod Control Room	2		
19	Control Room	6		
20	Hagan Relay Room	2		
21	Containment Elect. Penetrations	4		
22	RCP A RCP B RCP C	1 1 1		
23	HVH-1 HVH-2 HVH-3 HVH-4	1 1 1 1		
24	RHR Pit	2		
25	Pipe Space	6		

* Minimum number of detectors per train needed for suppression actuation.

** Minimum number of detectors needed for area coverage as per NFPA 72-E, 1978.

TABLE 3.14.2

HOSE STATIONS

<u>Location</u>	<u>Elevation</u>
1. Entrance to Cable Spread Room	242
2. Emergency Bus Room	246
3. Waste Disposal Panel Area	226
4. MCC 10 Area	226
5. Primary Water Pump Area	226
6. Boric Acid Batch Tank Room	246
7. Containment Entrance Area	226
8. Hose House Including Hydrant near Intake Structure	226
9. RHR Pump Area	244
10. Hagan Room	254
11. Pipe Alley	226

4.14 FIRE PROTECTION SYSTEM

Applicability:

Applies to periodic testing and surveillance program for Fire Protection System.

Objective:

To verify the ability of the Fire Protection System components to function as required and to prevent system degradation.

Specification:

4.14.1 Fire Detection Instrumentation

Each of the fire detectors in the fire detection zones in Table 3.14.1 shall be demonstrated OPERABLE at least once per 6 months by performance of a CHANNEL FUNCTIONAL TEST.

4.14.2 Fire Suppression Water System

The Fire Suppression Water System shall be demonstrated OPERABLE:

- a. At least once per month on a STAGGERED TEST BASIS by starting each pump from ambient conditions and operating it for $\geq N$ minutes. Note: $N = 15$ for the electric motor driven fire pump, and $N = 60$ for the propane engine driven fire pump.
- b. At least once per month by verifying that each valve (manual, power operated or automatic) in the flow path is in its correct position.
- c. At least once per 12 months by cycling each valve in the flow path through at least one complete cycle of full travel.
- d. At least once per 18 months by performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence, and:
 1. Verifying that each pump develops at least 2500 gpm at a system pressure of 125 psig.
 2. Verifying that each high pressure pump starts sequentially from ambient conditions to restore the fire suppression water supply pressure to ≥ 125 psig and runs for $\geq N$ minutes while loaded with the fire pump. Note: $N = 15$ for the electric motor driven fire pump, and $N = 60$ for the propane engine driven fire pump.
- e. At least once per 3 years by performing flow tests of the system in accordance with Section II, Chapter 5 of Fire Protection Handbook, 14th Edition published by Nation Fire Protection Association.

4.14.3 CO₂ Systems

The CO₂ systems shall be demonstrated OPERABLE:

- a. At least once per 6 months by verifying the weight of each high pressure cylinder.
- b. At least once per 18 months, by verifying the system valves and associated ventilation controls actuate automatically and manually, as appropriate, to a simulated actuation signal. A brief flow test or equivalent shall be made to verify flow from each nozzle.

4.14.4 Fire Hose Stations

Each fire hose station listed in Section 3.14 shall be verified OPERABLE:

- a. At least once per month by visual inspection of the station to assure all essential equipment is available.
- b. At least once per 18 months by removing the hose for inspection and re-racking and replacing all gaskets that are degraded in the couplings.
- c. At least once per three years, partially open each hose station valve to verify operability and no blockage.
- d. At least once per three years hydrotest the hose at each hose station per NFPA 198 except that the test pressure shall be at least 50 psi greater than the maximum zero flow pressure at that station.

4.14.5 Fire Barrier Penetration Seals

4.14.5.1 Penetration fire barriers shall be verified to be functional by a visual inspection:

- a. At least once per 12 months, and
- b. Prior to declaring a fire penetration seal functional following repairs or maintenance.

4.14.6 Fire Suppression Water System

4.14.6.1 The fire pump propane engine shall be demonstrated OPERABLE:

- a. At least once per month by verifying:
 1. The fuel storage tank contains at least 250 gallons of fuel, and
 2. See Specification 4.14.2.a.

4.14.6.1 b. At least once per 18 months, during shutdown, by:

1. Subjecting the propane engine to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of services, and
2. See Specification 4.14.2.d.2.

4.14.6.2 The fire pump propane engine starting battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The electrolyte level of each battery is above the plates, and
2. The overall battery voltage is \geq 24 volts.

b. At least once per 92 days by verifying that the specific gravity is appropriate for continued service of the battery.

c. At least once per 18 months by verifying that:

1. The batteries show no visual indication of physical damage or abnormal deterioration, and
2. The battery-to-battery and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.

4.14.7 Halon System

The Halon System shall be demonstrated OPERABLE:

- a. At least once per 6 months by verifying the weight and pressure of each high pressure cylinder.
- b. At least once per 18 months by verifying the system valves and associated ventilation controls actuate automatically and manually as appropriate, to a simulated actuation signal. A brief flow test or equivalent shall be made to verify flow from each nozzle.

4.14.8 Fire Water Pre-Action System

The Fire Water Pre-Action System protecting the Auxiliary Building hallway containing the Instrument and Service Air Compressors shall be demonstrated OPERABLE:

- a. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of travel.
- b. At least once per 18 months perform a system functional test which includes simulated automatic actuation of the system and which verifies that the automatic valves in the flow path actuate to their correct positions.