

ENCLOSURE  
PROPOSED TECHNICAL SPECIFICATION 3.14  
FIRE PROTECTION SYSTEMS  
AND  
PROPOSED TECHNICAL SPECIFICATION 4.15  
FIRE PROTECTION SYSTEMS SURVEILLANCE

REVISION 1  
December 1985

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### 3.14 FIRE PROTECTION SYSTEMS

**APPLICABILITY:** These specifications apply for the MODES indicated in the individual limiting conditions for operation.

**OBJECTIVE:** To ensure the operability of the fire protection systems for the required MODES.

#### **SPECIFICATION:**

- I. At all times the fire suppression water system<sup>1, 2</sup> shall be OPERABLE with:
  - A. Three fire suppression pumps, each with a capacity of at least 1000 gpm, with their discharge aligned to the fire suppression header. The three pumps may be selected from the five pumps available at San Onofre Units 1, 2 and 3.
  - B. Two separate water supplies (one from Unit 1 at least one from Units 2 & 3), each with a minimum contained volume of 300,000 gallons, and
  - C. An OPERABLE flow path capable of taking suction from each required water supply and transferring the water through distribution piping with OPERABLE sectionalizing control or isolation valves to the yard hydrant curb valves, the first valve upstream of the water flow alarm device on each sprinkler or hose standpipe, and the first valve upstream of the deluge valve on each deluge or spray system required to be OPERABLE per Specification 3.14.II, 3.14.III and 3.14.V.

#### **ACTION:**

- D. With one required pump and/or one water supply inoperable, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.
- E. With the fire suppression water system otherwise inoperable establish a backup fire suppression water system within 24 hours.

II. Whenever equipment protected by the spray and/or sprinkler system is required to be OPERABLE, the following spray and/or sprinkler systems shall be OPERABLE:

A. See Table 3.14.1

ACTION:

B. With one or more of the required spray and/or sprinkler systems protecting redundant safe shutdown systems outside containment inoperable, establish the following within 1 hour:

1. A continuous fire watch for accessible\*\* areas; and
2. Backup fire suppression equipment if applicable\*.

C. For other accessible\*\* areas outside containment establish an hourly fire watch patrol, within 1 hour.

D. For areas inside containment with one or more of the required spray and/or sprinkler systems inoperable, establish the following within 1 hour:

1. Inspect containment at least once per 8 hours or monitor the containment air temperature at least once per hour at the locations listed in Specification 3.14.VI.B.3; and
2. Backup fire suppression equipment if applicable\*.

E. During refueling operations, when the Refueling Water Storage Tank water has been transferred to the refueling cavity, backup fire suppression equipment shall be provided.\*

F. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

\* Fire hose will be run within 4 hours of entering the ACTION statement if an operable water supply is not available within 300 feet of the area containing the inoperable fire suppression. Fire hose will be supplied by the fire brigade responding to a fire if an operable water supply is available within 300 feet of the area containing the inoperable spray and/or sprinkler system. Any additional backup fire suppression equipment is provided by the fire brigade responding to a fire.

\*\* Inaccessible areas pose temporary radiation and/or life-threatening safety hazards.

Table 3.14.1

REQUIRED SPRINKLER AND SPRAY SYSTEMS

<u>Hazard</u>	<u>Location</u>	<u>System Type</u>
Reactor Coolant Pumps, RHR Pumps, Cable Insulation Outside Secondary Shield	Containment Sphere	Deluge - Borated Water Spray*
Turbine lubricating oil and cable insulation	System #1 Chemical Treatment Area	Deluge water spray
Turbine lubricating oil and cable insulation	System #2 Lube Oil Reservoir area (north half)	Deluge water spray
Turbine lubricating oil and cable insulation	System #3 Lube Oil Reservoir area (south half)	Deluge water spray
Turbine lubricating oil	System #4 480 V Room Wall & Turbine Building North Wall	Wet Pipe
Turbine lubricating oil and cable insulation	System #5 North Turbine Building Area Protection	Wet Pipe
Hydrogen Seal Oil	Hydrogen Seal Oil Unit	Deluge water spray
Diesel Generator	Diesel Generator Building 1	Pre-Action Sprinkler
Diesel Generator	Diesel Generator Building 2	Pre-Action Sprinkler
Transformer oil	Station Service Transformer 2 & 3	Deluge water spray

\* This includes a refueling water pump, 240,000 gallons of water in the refueling water storage tank and associated system valves.

III. Whenever equipment protected by the foam suppression system is required to be OPERABLE, the following foam suppression system shall be OPERABLE:

- A. Lube oil reservoir and conditioner.

ACTION:

- B. With the required foam system inoperable, establish the following within 1 hour;
  - 1. A continuous fire watch for the accessible\*\* area; and
  - 2. Backup fire suppression equipment if applicable\*.
- C. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

\* Fire hose will be run within 4 hours of entering the ACTION statement if an operable water supply is not available within 300 feet of the area containing the inoperable fire suppression system. Fire hose will be supplied by the fire brigade responding to a fire if an operable water supply is available within 300 feet of the area containing the inoperable spray and/or sprinkler system. Any additional backup fire suppression equipment is provided by the fire brigade responding to a fire.

\*\* Inaccessible areas pose temporary radiation and/or life-threatening safety hazards.

IV. Whenever equipment protected by the Halon system is required to be OPERABLE, the Halon systems in the following areas shall be OPERABLE:

- A. 4160 volt switchgear room
- B. 480 volt switchgear room

ACTION:

- C. With one or more of the required Halon systems inoperable, establish the following within 1 hour:
  - 1. A continuous fire watch for those accessible\*\* areas; and
  - 2. Backup fire suppression if applicable\*.
- D. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

\* Fire hose will be run within 4 hours of entering the ACTION statement if an operable water supply is not available within 300 feet of the area containing the inoperable fire suppression system. Fire hose will be supplied by the fire brigade responding to a fire if an operable water supply is available within 300 feet of the area containing the inoperable spray and/or sprinkler system. Any additional backup fire suppression equipment is provided by the fire brigade responding to a fire.

\*\* Inaccessible areas pose temporary radiation and/or life-threatening safety hazards.

V. Whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE, the following fire hose stations shall be OPERABLE:

A. See Table 3.14.2

ACTION:

- B. With one or more of the required fire hose stations inoperable, within 4 hours establish backup means of fire suppression if applicable\* and within 4 hours post signs above the inoperable hose station(s) and related valves.
- C. The provision of Specification 3.0.3 and 3.0.4 are not applicable.

\* Fire hose will be run within 4 hours of entering the ACTION statement if an operable water supply is not available within 300 feet of the area containing the inoperable fire suppression system. Fire hose will be supplied by the fire brigade responding to a fire if an operable water supply is available within 300 feet of the area containing the inoperable spray and/or sprinkler system. Any additional backup fire suppression equipment is provided by the fire brigade responding to a fire.

Table 3.14.2

FIRE HOSE STATIONS

<u>Fire Area or Zone</u>	<u>Elevation</u>	<u>Hose Station Number</u>
Inside Sphere	42' - 0"	25
Reactor Auxilliary Building, Lower Level	5' - 0"	17
Boric Acid Injection Pump Room	20' - 0"	16
Turbine Plant Cooling Water Area	14' - 0"	8
Chemical Feed and Lubrication-Oil Reservoir Area	14' - 0"	22
East Feedwater Pump/Condenser Area	8' - 6"	5
East Feedwater Pump/Condenser Area	14' - 0"	3
East Feedwater Pump/Condenser Area	14' - 0"	4
West Feedwater Pump/Condenser Area	14' - 0"	7
West Feedwater Pump/Condenser Area	8' - 6"	6
Turbine and Heater Decks	35' - 6"	10
Turbine and Heater Decks	35' - 6"	11
Turbine and Heater Decks	42' - 0"	12
Turbine and Heater Decks	42' - 0"	13
Turbine and Heater Decks	35' - 6"	14
Turbine and Heater Decks	35' - 6"	15
Administration/Control Building, First Floor Single-Story Office Area	20' - 0"	26
Administration/Control Building, First Floor Health Physics and Locker Area	20' - 0"	27



Table 3.14.2

FIRE HOSE STATIONS  
(Continued)

<u>Fire Area or Zone</u>	<u>Elevation</u>	<u>Hose Station Number</u>
Control Room Area	42' - 0"	29
Administration/Control Building, Third Floor East Office Space and Storage	42' - 0"	30
4160 Volt Switchgear West	14' - 0"	9
Diesel-Generator Room No. 1	20' - 0"	2
Diesel-Generator Room No. 2	20' - 0"	1
Sphere Enclosure Cable penetration Area	20' - 0"	18
Sphere Enclosure Cable penetration Area	20' - 0"	19
Sphere Enclosure Cable penetration Area	20' - 0"	20
Sphere Enclosure Cable penetration Area	20' - 0"	21
Administration/Control Building, Second Floor North Stairwell	32' - 0"	28

VI. Whenever equipment protected by the fire detection instrument is required to be OPERABLE, as a minimum, the following fire detection instrumentation for each required fire detection zone shall be OPERABLE:

A. See Table 3.14.3

ACTION:

B. With the number of OPERABLE fire detection instruments less than the minimum number OPERABLE requirement of TABLE 3.14.3:

1. For accessible\* areas outside containment establish within 1 hour an hourly fire watch patrol.
2. For areas inside containment, inspect containment, at least once per 8 hours or monitor the temperature at least once per hour at the locations listed below:
  - a. Inside the secondary shield: air after primary coolant motor cooling fan unit, primary coolant motor space, and reactor cavity air inlet; reactor coolant pump lower bearing coolant, motor winding and oil lubricated bearing.
  - b. Outside the secondary shield: control rod cooler discharge, control rod shroud air inlet, sphere space, and control rod cooler inlet.
3. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

\* Inaccessible areas pose temporary radiation and/or life-threatening safety hazards.

Table 3.14.3  
FIRE DETECTION INSTRUMENTS

Detector Zone	Location	Minimum Instruments Operable			
		Smoke Detectors	Infrared Flame Detectors	Thermal Detectors	Ultraviolet Flame Detectors
1	No. 1 DC Switchgear and Battery Room	3			
2	480-V Switchgear Room	8			
3	4160-V Switchgear Room	18			
4	Exciter and MCC 3 Area	16*	2		
5	Administration Building, 1st Floor	4**			
7	Control Room Complex	20			
8	Turbine Lube Oil Reservoir	29	6	6***	
9	Containment Sphere Inside Secondary Shield	7*	1		
10	Containment Sphere Outside Secondary Shield	10	2	8	
11	Reactor Auxiliary Building and Storage Rooms	10*			
16	Sphere Enclosure Building	12		15	4
17	Lube Oil Shed		1		
18	Air Compressors		1		
19	Ventilation Equipment Room	2			
20	Pipe Tunnel	4			
21	No. 2 Battery		1		
22	Service Transformers 2&3				2
DG1	No. 1 Diesel Generator Room	2	2		
DG2	No. 2 Diesel Generator Room	2	2		

Note: The Fire Detection Zones not identified either do not contain safety related equipment or do not involve potential fire hazards to safety related equipment.

\* Includes one high flow smoke detector.

\*\* Detectors above suspended ceiling.

\*\*\*Line type heat detectors.

VII. The following specifications shall apply when equipment protected by fire rated assemblies is required to be OPERABLE.

- A. All fire rated assemblies (walls, floor/ceilings, cable tray enclosures and other fire barriers) separating safety related fire areas or separating portions of redundant systems important to safe shutdown within a fire area and all sealing devices in fire rated assembly penetrations (fire doors, fire dampers, cable, ventilation duct, and piping penetration seals) shall be OPERABLE.

ACTION

- B. With one or more of the above required fire rated assemblies and/or sealing devices within an accessible\* fire area/zone inoperable, within 1 hour either establish the OPERABILITY of the fire detectors\*\* on at least one side of the inoperable assembly and establish an hourly fire watch patrol, or establish a continuous fire watch.
- C. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

\* Inaccessible areas pose temporary radiation and/or life-threatening safety hazards.

\*\* In lieu of the fire detectors, the following automatic suppression systems may be used in accordance with the action statement.

Turbine Building - North Wall: Sprinkler system #4 & #5  
480 Volt Room - East Wall: Sprinkler system #4 & #5  
480 Volt Room - South Wall: Sprinkler system #4 (Portion at wall located  
inside Turbine Bldg)  
4160 Volt Room - West Wall: Sprinkler system #5

## BASES

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, spray, and/or sprinklers, 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 fire protection measures are required to be made available in the affected areas until the inoperable equipment is restored to service. In the event 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 fire brigade backup fire suppression operability consists of a minimum of 1000 feet of 2-1/2 inch diameter (or larger) and 200 feet of 1-1/2 inch diameter (or larger) fire hose carried between site fire engines.

The surveillance requirements provide assurance that the minimum OPERABILITY requirements of the fire suppression systems are met.

The OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate 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.

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

The OPERABILITY of the fire barriers and barrier penetration seals ensures that fire damage will be limited. These design features minimize the possibility of a single fire involving more than one fire area prior to detection and extinguishment. The fire barriers, fire barrier penetration seals for conduits, cable trays and piping, fire dampers, and fire doors are periodically inspected to verify their OPERABILITY.

In the event a fire rated assembly is determined inoperable, the establishment of a continuous Fire watch or a hourly Fire watch patrol with operable Fire detection on one side of the assembly is required. The usage a hourly patrol with automatic fire suppression system is acceptable, when the automatic suppression system provides adequate protection for the inoperable fire rated assembly.

Accessible fire areas as identified in the action statements of the LCO's are defined as areas that do not pose radiation and/or life-threatening safety hazards which are of a temporary nature. The areas which pose a radiation and/or life-threatening safety hazards of a permanent nature (e.g., containment) include alternate actions which would protect personnel from those hazards.

Reference

1. Fire Protection Program Review, BTP APCSB 9.5-1, San Onofre Nuclear Generating Station, Unit 1, March 1977; submitted to the NRC by letter dated March 16, 1977 in Docket No. 50-206.
2. Fire Protection Safety Evaluation Report, by The Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, In The Matter of Southern California Edison Company, San Onofre Nuclear Generating Station Unit 1, Docket No. 50-206, July 19, 1979; provided to SCE by letter dated July 19, 1979.

#### 4.15 FIRE PROTECTION SYSTEMS SURVEILLANCE

APPLICABILITY: Defines the surveillance required to demonstrate the operability of the fire protection systems applicable in the MODES specified in Section 3.14.

OBJECTIVE: To ensure the OPERABILITY of the fire detection and extinguishing systems and equipment.

#### SPECIFICATION:

- I. The fire suppression water system shall be demonstrated OPERABLE:\*
- A. At least once per 7 days by verifying the contained water supply volume.
- B. At least once per 31 days on a STAGGERED TEST BASIS by starting each electric motor driven pump and operating it for at least 15 minutes.
- C. At least once per 31 days by verifying that each valve (manual, power operated or automatic) accessible during plant operation in the flow path is in its correct position.
- D. At least once per 12 months by cycling each testable valve accessible during plant operation in the flow path through at least one complete cycle of full travel.
- E. 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 automatic valve in the flow path actuates to its correct position.
  2. Verifying that each pump develops at least 1000 gpm at a system head of 248 feet.
  3. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel, and
  4. Verifying that each fire suppression pump starts (sequentially) to maintain the fire suppression water system pressure greater than or equal to 50 psig.
  5. Verifying that each valve (manual, power operated or automatic) in the flow path is in its correct position.
- F. At least once per 3 years by performing a system flush and a flow test of the system in accordance with Chapter 5, Section 11 of the Fire Protection Handbook, 14th Edition, published by the National Fire Protection Association.

\* For San Onofre Units 2 and 3 equipment, the San Onofre Units 2 and 3 Technical Specification Surveillance Requirements shall apply.

II. Each of the required spray and/or sprinkler systems shall be demonstrated OPERABLE:

- A. At least once per 31 days by verifying that each valve (manual, power operated, or automatic) outside of containment in the flow path is in its correct position.
- B. At least once per 31 days during each cold shutdown exceeding 1 week or refueling by verifying that each valve (manual, power operated, or automatic) inside of containment in the flow path is in its correct position.
- C. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.
- D. At least once per 18 months:
  1. By performing a system functional test which includes simulated automatic actuation of the system, and
    - a. Verifying that the automatic valves in the flow path actuate to their correct positions on a test signal, and
    - b. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel.
  2. By a visual inspection of the dry pipe spray and sprinkler headers to verify their integrity, and
  3. By a visual inspection of each nozzle's spray area to verify the spray pattern is not obstructed.
- E. At least once per 3 years by performing an air flow test through each open head spray/sprinkler header and verifying each open head spray/sprinkler nozzle is unobstructed.



III. Each of the required foam suppression systems shall be demonstrated OPERABLE:

- A. At least once per 31 days by:
  - 1. Verifying the foam storage tank contains a minimum of 95 gallons.
  - 2. Verifying that each valve (manual, power operated, or automatic) in the flow path is in its correct position.
- B. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.
- C. At least once per 18 months:
  - 1. By performing a system functional test which includes simulated automatic actuation of the system, and
    - a. Verifying that the automatic valves in the flow path actuate to their correct positions on a test signal, and
    - b. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel.
  - 2. By a visual inspection of the dry pipe spray headers to verify their integrity, and
  - 3. By a visual inspection of each nozzle's spray area to verify the spray pattern is not obstructed, and
  - 4. By a performance evaluation of the AFFF concentrate and/or premix solution quality.
- D. At least once per 3 years by performing an air flow test through each open head spray header and verifying each open head spray nozzle is unobstructed.

IV. Each of the required Halon systems shall be demonstrated OPERABLE:

- A. At least once per 31 days by verifying that each valve (manual, power operated, or automatic), in the flow path is in its correct position.
- B. At least once per 6 months by verifying Halon storage tank weight to be at least 95% of full charge weight and pressure to be at least 90% of full charge pressure.
- C. At least once per 18 months:
  1. Verifying the system, including associated ventilation system fire dampers and fire door release mechanisms, actuates, manually and automatically, upon receipt of a simulated actuation signal; and
  2. Performance of a visual inspection of the system headers of verify their integrity, and
  3. Performance of a visual inspection of the system nozzles to assure no blockage.

V. Each of the fire hose stations shown in Table 3.14.2 shall be demonstrated OPERABLE:

- A. At least once per 31 days by a visual inspection of the fire hose stations accessible during plant operations to assure all required equipment is at the station.
- B. At least once per 18 months by:
  - 1. Visual inspection of the stations not accessible during plant operations to assure all required equipment is at the station,
  - 2. Removing the hose for inspection and re-racking, and
  - 3. Inspecting all gaskets and replacing any degraded gaskets in the couplings.
- C. At least once per 3 years by:
  - 1. Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage.
  - 2. Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above maximum fire main operating pressure whichever is greater.

- VI. Each of the required fire detection instruments identified in Table 3.14.3 which are accessible during plant operation shall be demonstrated OPERABLE at least once per 6 months by performance of a Channel Test. Fire detectors which are not accessible during plant operation shall be demonstrated OPERABLE by the performance of a Channel Test during each COLD SHUTDOWN exceeding 1 week unless performed in the previous 6 months.

VII. Each of the required Fire doors shall be verified OPERABLE by inspecting the automatic hold-open, release and closing mechanism and latches at least once per 6 months, and by verifying:

- a. The OPERABILITY of the fire door supervision system for each electrically supervised fire door by performing a TRIP ACTUATING DEVICE OPERATIONAL TEST at least once per 31 days,
- b. That each locked closed fire door is closed at least once per 7 days,
- c. That each unlocked fire door without electrical supervision is closed at least once per 24 hours.

VIII. At least once per 18 months the required fire rated assemblies and penetration sealing devices other than fire doors shall be verified OPERABLE by:

- A. Performing a visual inspection of the exposed surfaces of each fire rated assembly.
- B. Performing a visual inspection of each fire damper and associated hardware.
- C. Performing a visual inspection of at least 10% of each type (mechanical and electrical) of sealed penetration. If apparent changes in appearance or abnormal degradations are found, a visual inspection of an additional 10% of each type of sealed penetration shall be performed. This inspection process shall continue until a 10% sample with no apparent changes in appearance or abnormal degradation is found. Samples shall be selected such that each penetration seal will be inspected at least once per 15 years.

#### BASES

Areas accessible during plant operation do not pose a permanent personnel hazard nor a mechanical accessibility problem with respect to surveillance of the fire protection equipment in the area (e.g., containment). The equipment associated with areas which are not accessible during plant operation are surveilled at plant shutdown or every 18 months.

For additional bases refer fo the BASES for Technical Specification 3.14.