ENCLOSURE 3

SOUTHERN CALIFORNIA EDISON
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1

10CFR50 APPENDIX R EXEMPTION REQUESTS

Prepared for:

U. S. Nuclear Regulatory Commission

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FIRE AREA/ZONE 1-AB-(-3)-2A

TITLE: Reactor Auxiliary Building Lower Level

FIGURE: 3-3

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of the redundant charging pumps and the charging RWST isolation valves within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Alternative shutdown capability is available through the use of the safety injection system. The fire zone does not meet the requirements of Section III.G.3 of Appendix R, in that partial area fire detection and fixed fire suppression systems are provided in the fire zone.

AREA DESCRIPTION

Physical Characteristics

This zone consists of the boric acid injection pump room and the lower level of the reactor auxiliary building, which contains the charging pump room, the radwaste processing rooms, and the radwaste tank rooms.

Below grade, the wall of the zone adjoining the pipe tunnel (1-AB-11-34) is 3 hour rated. The remaining below grade walls are reinforced concrete with a minimum thickness of 18 inches. The ceiling is precast concrete slab with an approximate thickness of 21 inches.

At grade level, the north wall of the boric acid injection pump room is 3 hour rated. The east wall of the boric acid injection pump room, which adjoins the volume control tank room (1-AB-20-3) is reinforced concrete with an approximate thickness of 24 inches. The remaining walls of the boric acid injection pump room are filled 8 inch concrete block. The walls of the gas stripper cubicle are also reinforced concrete with an approximate thickness of 24 inches.

A nonrated door opens to the boric acid injection pump room from the yard area (1-YD-14-4D). A 3 hour rated door separates the zone from the solid waste baling room (1-AB-20-2C). Ventilation penetrations to the yard area (1-YD-14-4D) and the solid waste baling room (1-AB-20-2C) are not provided with fire dampers.

Combustibles

The in situ combustible loading in the fire zone is approximately 4,650 Btu/sq.ft., with an equivalent fire severity of four minutes. The in situ combustible loading consists primarily of cable insulation, lube oil contained within the charging pumps, and miscellaneous plastics and class A materials.

Redundant Equipment

The reactor auxiliary building lower level contains the following redundant equipment used to achieve hot standby and cold shutdown:

- Charging pumps
- Charging RWST isolation valves
- Motor control center 2A
- Associated power and control cabling.

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Ionization smoke detectors are provided at the following locations within the fire zone:

- the charging pump room
- at motor control center 2A
- at the radwaste control board
- outside the radwaste tank rooms
- in the boric acid injection pump room.

Suppression

Portable fire extinguishers and fire hose stations are available within the fire zone for manual fire fighting capability.

BASIS FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that fire detection and fixed fire suppression be installed in any area for which alternative shutdown capability is provided. The technical bases which justify the exemption request are detailed below.

1. Alternative shutdown capability is provided outside the fire zone.

2. The combustible fire loading in the fire zone results in an equivalent fire severity of four minutes.

3. Fire detection and automatic fire suppression will be installed to provide complete coverage of the charging pump room.

4. Ionization smoke detectors are provided locally in hazard areas within the remainder of the fire zone.

5. Portable fire extinguishers and fire hose stations are available for manual fire fighting capability.

6. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of an alarm.

7. **The addition of fire detection and suppression systems throughout the remainder of the fire zone would not enhance, to a significant degree, the protection of safe shutdown functions which is provided by the existing configuration.**

TITLE: East Penetration Area

FIGURE: 3-1, 3-2

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of redundant trains of safe shutdown equipment within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Dedicated shutdown capability has been provided for use in the event of a fire in this zone. The fire area does not meet the requirements of Section III.G.3 of Appendix R, in that partial area fire detection is provided in the fire zone, and a fixed fire suppression system is not provided within the fire zone.

AREA DESCRIPTION

Physical Charcteristics

The east penetration area is an exterior fire zone, which is bounded by the steel containment sphere, the enclosure building, the power block and the turbine building. The west boundary of the zone is open to the west penetration area (1-YD-20-4B), and coincides with the north-south centerline of containment. The wall adjoining the 4160V switchgear room (1-PB-14-8) is 3 hour rated. The wall which separates the zone from the chemical feed area in the turbine building ground floor (1-TB-8-9A) is 1 hour rated. The wall adjoining the health physics area of the ground floor of the power block (1-PB-20-11A) is reinforced concrete with a minimum thickness of 12 inches. The enclosure building wall is concrete with an approximate thickness of 3 feet. A nonrated door provides access to the fire zone from the health physics area 1-PB-20-11A). The zone is open to the yard area (1-YD-14-4D) at walkways.

Combustibles

The in situ combustible loading in the east penetration area is approximately 34,000 Btu/sq.ft., with an equivalent fire severity of 26 minutes. The in situ combustible loading primarily consists of cable insulation.

Redundant Equipment

The east penetration area contains cabling for the following redundant equipment used to achieve hot standby and cold shutdown:

- PORVs and associated block valves
- Pressurizer level transmitters
- Pressurizer pressure transmitters
- Primary system temperature transmitters
- Charging loop A control valve
- RCP seal flow pressure transmitters
- Steam generator level transmitters

- Auxiliary feedwater pumps
- Auxiliary feedwater flow control valves
- Thermal barrier pump
- Thermal barrier outlet valves
- Residual heat removal isolation valves

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Two types of fire detectors are provided within the east penetration area:

- ionization smoke detectors within the enclosure building,
- ultraviolet detectors located at the east entrance to the area.

Suppression

Portable fire extinguishers and fire hose stations are located within the fire zone and in adjacent fire zones for manual fire fighting capability.

BASIS FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that fire detection and fixed suppression be installed throughout any area for which dedicated shutdown capability is provided. The technical bases which justify the exemption are detailed below.

1. Dedicated shutdown capability is provided outside the fire zone.

2. Cables for the primary system hot leg temperature instruments which provide indication at the dedicated shutdown panel, which are currently routed through this zone, will be abandoned, and new cables routed outside this fire zone to the dedicated shutdown panel.

3. The combustible loading within the fire zone results in an equivalent fire severity of 26 minutes.

4. Approximately 40 feet, without intervening combustibles, separates the cable trays in the east and west penetration areas (1-YD-20-4A and 1-YD-20-4B respectively). The large spatial separation will prevent the propagation of a fire between these fire zones.

5. Ionization smoke detectors and ultraviolet detectors are located locally within the fire zone for early warning alarm in the control room.

6. Portable fire extinguishers and fire hose stations are available for manual fire fighting.

7. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the first alarm.

8. Station service transformer 1, which is located in the yard area (1-YD-14-4D) adjacent to the east entrance to this fire zone, will be provided with an automatic water spray system to provide protection for the cables within the fire zone from the hazards of an oil fire at this transformer. Curbing will be provided at the transformer to contain an oil spill.

9. Combustible gases and heat generated by a fire in this fire zone would be dissipated to atmosphere or to the top of the enclosure building.

10. The plant circuit breakers will be tripped to deenergize offsite power and prevent/mitigate spurious equipment operation. The operation of the plant circuit breakers can be accomplished at one panel, located near the control room exit, as the operators evacuate the control room.

11. Operator action will be taken to manually control certain valves located outside the fire zone, in order to initiate dedicated shutdown system operation.

12. The addition of a fixed suppression system and the installation of fire detection to provide coverage of the remainder of the fire zone would not enhance, to a significant degree, the protection of safe shutdown functions.

FIRE AREA/ZONE: 1-YD-20-4B

TITLE: West Penetration Area

FIGURE: 3-1, 3-2, 3-3

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of redundant trains of safe shutdown equipment within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Dedicated shutdown capability has been provided for use in the event of a fire in this zone. The fire area does not meet the requirements of Section III.G.3 of Appendix R, in that partial area fire detection is provided in the fire zone and a fixed fire suppression system is not provided in the fire zone.

AREA DESCRIPTION

Physical Charcteristics

The west penetration area is an exterior fire zone, which is bounded by the steel containment sphere, the enclosure building, the fuel handling building and the turbine building. The east boundary of the zone is open to the east penetration area (1-YD-20-4A), and coincides with the north-south centerline of containment. The wall which separates the zone from the chemical feed area in the turbine building ground floor (1-TB-8-9A) is 1 hour rated. The wall adjoining the spent fuel pool (1-FH-(-2)-5) is reinforced concrete with an approximate thickness of 4 feet. The enclosure building wall is concrete with an approximate thickness of 3 feet. The zone is open to the yard area (1-YD-14-4D) at the west end. Two 3 hour rated doors open to the west side of the enclosure building from the yard area. A barred nonrated door is provided at an above ground platform at the north end of the enclosure building. Two nonrated doors communicate with the ventilation equipment building (1-VN-20-24).

Combustibles

The in situ combustible loading in the west penetration area is approximately 24,500 Btu/sq.ft., with an equivalent fire severity of 18 minutes. The in situ combustible loading primarily consists of cable insulation.

Redundant Equipment

The west penetration area contains cabling for the following redundant equipment used to achieve hot standby and cold shutdown:

- Pressurizer level transmitters
- Charging loop A control valve
- Charging loop A flow transmitter
- Seal injection flow control valves
- RCP seal flow pressure transmitters
- Atmospheric steam dump valves

- Auxiliary feedwater pumps
- Auxiliary feedwater flow control valves
- Thermal barrier outlet valves
- RHR heat exchanger CCW flow control valves
- RHR flow control valve
- RHR temperature indication
- Residual heat removal isolation valves
- PORV nitrogen control valve

The following portions of the dedicated shutdown system are located within the west penetration area:

Reactor Coolant System

- Cables for the following components:
  - o primary system temperature instruments
  - o pressurizer pressure transmitter
  - o pressurizer level transmitter

Main Steam System

- Cables for the following components:
  - o steam generator level transmitters

Cables for the dedicated shutdown system operation of pressurizer heater group D, and cables for the dedicated solenoids for the PORVs and the block valves will also be routed through this fire zone.

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Two types of fire detectors are provided within the west penetration area:

- ionization smoke detectors within the enclosure building,
- ultraviolet detectors located at the east entrance to the area.

Suppression

Portable fire extinguishers and fire hose stations are located within the fire zone and in adjacent fire zones for manual fire fighting capability.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that fire detection and fixed suppression be installed throughout any area for which dedicated shutdown capability is provided. The technical bases which justify the exemption are detailed below.

1. Cables for the dedicated shutdown system, which will be routed through this zone, will be protected by a 3 hour rated barrier.

2. The combustible loading within the fire zone results in an equivalent fire severity of 18 minutes.

3. Approximately 40 feet, without intervening combustibles, separates the cable trays in the west and east penetration areas (1-YD-20-4B and 1-YD-20-4A respectively). The large spatial separation will prevent the propagation of a fire between these fire zones.

4. Ionization smoke detectors and ultraviolet detectors are located locally within the fire zone for early warning alarm in the control room.

5. Portable fire extinguishers and fire hose stations are available for manual fire fighting.

6. The San Onofre Fire Department consistes of porfessionally trained, full time personnel, whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the first alarm.

7. An automatic suppression system will be provided for the protection of the cable trays which pass through the west boundary of the fire zone into the adjacent yard area (1-YD-14-4D).

8. Fire stops will be provided for cable trays which pass through the west boundary of the fire zone into the adjacent yard area (1-YD-14-4D).

9. Combustible gases and heat generated by a fire in this fire zone would be dissipated to atmosphere or to the top of the enclosure building.

10. The plant circuit breakers will be tripped to deenergize offsite power and prevent/mitigate spurious equipment operation. The operation of the plant circuit breakers can be accomplished at one panel, located near the control room exit, as the operators evacuate the control room.

11. Operator action will be taken to manually control certain valves located outside the fire zone, in order to initiate dedicated shutdown system operation.

12. The addition of a fixed fire suppression system and the installation of fire detection to provide coverage of the remainder of the fire zone would not enhance, to a significant degree, the protection of safe shutdown functions.

FIRE AREA/ZONE: 1-YD-14-4D

TITLE: Yard Area

FIGURE: 3-1, 3-3

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of the redundant station service transformers within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2.b. The station service transformers are separated by approximately 150 feet, including approximately 40 feet without intervening combustibles, however fire detection and fixed suppression systems are not provided throughout the fire zone.

The separation of cables for the charging pumps within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Cables for one of the charging pumps will be rerouted outside the fire zone, and the intervening cable trays provided with fire stops. The fire zone does not meet the requirements of Section III.G.2.b of Appendix R, in that fire detection and fixed suppression is not provided throughout the fire zone.

The separation of the component cooling water pumps, and cables for the saltwater cooling pumps does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Alternative shutdown capability has been provided. The fire zone does not meet the requirements of Section III.G.3 of Appendix R in that fire detection and fixed suppression is not provided throughout the fire zone.

AREA DESCRIPTION

Physical Characteristics

The yard area fire zone consists of the yard surrounding the sphere enclosure building, and west of the fuel handling and turbine buildings. The zone is bounded by the vital area fence. Nonrated doors open from the zone to the turbine building ground floor (1-TB-8-9A), the reactor auxiliary building (1-AB-(-3)-2A, 1-AB-20-2C, 1-AB-20-2D, 1-AB-20-2L, 1-AB-30-2P), the ventilation building (1-VN-20-24) and the PASS control compartment (1-YD-7-28). A steel personnel escape hatch communicates with containment (1-CO-(-10)-1). The zone is separated from the 480V switchgear room (1-FH-14-7), the west penetration area (1-YD-20-4B), and the resin slurry tank room (1-AB-20-2G) by 3 hour rated doors. A nonrated door is provided at an above ground platform at the north end of the sphere enclosure building.

Combustibles

The in situ combustible loading in the yard area is approximately 33,200 Btu/sq.ft, with an equivalent fire severity of 25 minutes. The in situ loading is due primarily to cable insulation, transformer oil within station service transformers 2 and 3, lube oil stored within the clean and dirty lube oil storage tanks, and miscellaneous class A combustibles and plastic.

Redundant Equipment

The yard area contains the following redundant equipment used to achieve hot standby or cold shutdown:

Chemical and Volume Control System

- RWST
- RWST isolation valve
- Cables for the following components:
  - o Charging pumps and associated support equipment
  - o Charging RWST isolation valves
  - o RWST isolation valve
  - o Charging loop A flow control valve
  - o Charging loop A flow transmitter
  - o Seal injection flow control valves

Auxiliary Feedwater System

- Auxiliary feedwater flow control valves
- Cables for the following components
  - o Motor driven auxiliary feedwater pump
  - o Steam driven auxiliary feedwater pump
  - o Auxiliary feedwater flow control valves

Main Steam System

- Steam dump transfer control valve cables

Component Cooling Water System

- Component cooling water pumps
- Component cooling water heat exchangers
- CCW heat exchanger isolation valves
- CCW surge tank
- CCW/RHR heat exchanger flow control valves
- Associated power and control cabling

Saltwater Cooling System

- Saltwater cooling pump cables

Gaseous Nitrogen System

- Nitrogen bottles

Essential Electric Systems

- Station Service Transformers 1, 2, and 3
- Cables for the following components
  - o 480V switchgear
  - o 120V vital buses

The dedicated shutdown system diesel generator, dedicated shutdown panel, dedicated auxiliary feedwater pump, and associated equipment will be located in the northwest section of the yard area.

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Ultraviolet flame detectors are located at station service transformer 2 and at station service transformer 3.

Suppression

Automatic water spray systems, actuated by ultraviolet detectors, are installed over station service transformer 2 and over station service transformer 3. Portable fire extinguishers, fire hose stations, and fire hydrants are available within the fire zone for manual fire fighting capability.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.2.b, which requires that full area fire detection and fixed fire suppression be installed where redundant systems are not separated by rated fire barriers but are separated by greater than 20 feet without intervening combustibles.

An exemption is requested to 10CFR50 Appendix R, Section III.G.3 which requires that full area fire detection and fire suppression be installed in any fire area where alternative shutdown capability is provided.

The technical bases which justify the exemption request are detailed below.

1. The maximum credible fire in the fire zone is limited by the zone's large floor area and the localized nature of the combustible loading at the following hazards: station service transformer 1, station service transformers 2 and 3, the component cooling water pumps, and the clean and dirty lube oil storage tanks.

2. Automatic water spray systems are installed locally at station service transformers 2 and 3 to provide protection from an oil fire at these transformers. Curbing is installed around these transformers to contain an oil spill.

3. An automatic water spray system will be installed at station service transformer 1 to provide protection from an oil fire at this transformer. Curbing will be installed around the transformer to contain an oil spill.

4. Curbing is installed around the clean and dirty lube oil storage tanks to contain an oil spill from these tanks.

5. Portable fire extinguishers, fire hose stations and fire hydrants are available for manual fire fighting.

6. Combustible gases and heat generated by a fire in this fire zone would be dissipated to the atmosphere.

7. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the alarm.

8. The station service transformers are separated by approximately 150 feet, including 40 feet without intervening combustibles.

   The extremely large spatial separation between station service transformer 1 and station service transformers 2 and 3 will allow the train 1 480V electrical system to remain available if the train 2 and train 3 480V electrical systems are damaged by fire, or allow the train 2 and train 3 480V electrical systems to remain available if the train 1 480V electrical system is damaged by fire.

   Operator action may be taken to intertie the 480V switchgear to provide power to components on the redundant switchgear. The intertie cables are routed outside the fire zone, and will remain available.

9. Cables for the redundant charging pumps could be damaged by the fire. Cables for one charging pump will be rerouted outside the fire zone to achieve a separation of greater than 20 feet.

   Cables for the train 1 charging pump and its associated support equipment will be rerouted out of the yard area. The cables will be rerouted to achieve a separation of greater than 20 feet between the redundant charging pump cables. The intervening cable trays will be fire stopped at the boundary of fire area/zones 1-YD-20-4B and 1-YD-14-4D. An automatic suppression system will be installed for the protection of the cables at the boundary of fire area/zones 1-YD-20-4B and 1-YD-14-4D.

10. The three component cooling water pumps are adjacent to one another, but are separated by greater than 100 feet from the auxiliary feedwater pump, located in fire zone 1-TB-8-9A, which will be used to provide alternative shutdown capability in the event the three component cooling water pumps are damaged by fire.

    The cables for the train 1 component cooling water pump will be wrapped with a material which constitutes a 1 hour rated fire barrier, and suppression and detection will be installed for the protection of the cables for the component cooling water pumps, at the boundary of the west penetration area and the yard area.

    For a fire in this area, the charging pumps will remain available, therefore the component cooling water pumps are only required to support the operation of the residual heat removal pumps for cold shutdown.

    Should a fire damage all three component cooling water pumps, the motor driven auxiliary feedwater pump may be used for single phase cooldown. The motor driven auxiliary feedwater pump is separated from the component cooling water pumps by greater than 100 feet, including 20 feet without in situ intervening combustibles. The automatic suppression system which is to be installed on the cable trays at the boundary of the yard area and the west penetration area will also prevent the propagation of the fire between the component cooling water pumps and the motor driven auxiliary feedwater pump.

11. Cables for the redundant saltwater cooling pumps could be damaged by the fire. The auxiliary saltwater cooling pump will be used to provide alternative shutdown capability.

12. Operator action will be taken to locally control certain valves located outside the fire zone, and to locally control certain valves located within the fire zone after extinguishment of the fire. The time required to perform the manual actions has been evaluated to assure adequate time and manpower will be available to perform the necessary manual actions.

13. The addition of full area fire detection and fixed fire suppression systems or additional protection for the separation of safe shutdown systems would not significantly enhance the protection of safe shutdown functions, beyond the level of protection provided by the existing configuration.

TITLE: Circulating Water Pump Well

FIGURE: 3-3

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of the redundant saltwater cooling pumps within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Alternative shutdown capability is available through the use of the auxiliary saltwater cooling pump (G-13C). The fire zone does not meet the requirements of Section III.G.3 of Appendix R, in that fire detection and fixed fire suppression systems are not provided throughout the fire zone.

AREA DESCRIPTION

Physical Characteristics

The circulating water pump well is an exterior fire zone, located below grade, in the yard area west of the turbine building. Staircases on the north and south walls of the pump well allow access to the fire zone.

Combustibles

The in situ combustible loading in the circulating water pump well is approximately 1265 Btu/sq.ft., with an equivalent severity of one minute. The in situ loading is primarily composed of gasoline, which is used to power the engine driven screen wash pump, and plywood used for battery boxes.

Redundant Equipment

The circulating water pump well contains the following redundant equipment used to achieve hot standby and cold shutdown:

- Saltwater cooling pumps
- Associated power and control cabling

ACTIVE FIRE PROTECTION CAPABILITY

Detection

No fire detection equipment is provided within the fire zone.

Suppression

A portable fire extinguisher is located within the fire zone for manual fire fighting capability. In addition, fire hose stations and portable fire extinguishers are available from the adjacent yard area, or the turbine building.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that fire detection and fixed fire suppression be installed throughout any area for which alternative shutdown capability is provided. The technical bases which justify the exemption request are detailed below.

1. Alternative shutdown capability is provided outside the fire zone.

2. The combustible fire loading in the fire zone results in an equivalent fire severity of one minute.

3. Combustible gases and heat generated by a fire in the zone would be dissipated to the atmosphere.

4. Portable fire extinguishers and fire hose stations are available for manual fire fighting.

5. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the alarm.

6. The addition of full area fire detection or fixed automatic fire suppression system, would not enhance, to a significant degree, the protection of safe shutdown functions within the fire zone.

FIRE AREA/ZONE: 1-TB-8-9A

TITLE: Turbine Building Ground Floor

FIGURE: 3-1

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of redundant trains of safe shutdown equipment within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G. 2. Dedicated shutdown capability has been provided for use in the event of a fire in this zone. The fire area does not meet the requirements of Section III.G.3 of Appenidx R, in that partial area fire detection and fixed fire suppression systems are provided in the fire zone.

AREA DESCRIPTION

Physical Characteristics

The turbine building ground floor contains the condenser and main feedwater pump areas, the turbine lube oil reservoir area, and the auxiliary feedwater pumps. The north wall of the zone, which separates the zone from 4160V switchgear room (1-PB-14-8) is 3 hour rated. The walls of the lube oil storage shed (1-TB-14-10) are also 3 hour rated. The wall adjoining the east and west penetration areas (1-YD-20-4A, 1-YD-20-4B), and the east wall of the 480V switchgear room (1-FH-14-7) are 1 hour rated. The south wall of the 480V switchgear room is 3 hour rated. The remainder of the zone walls are constructed of concrete block or reinforced concrete. Three hour rated doors allow access to the 4160V switchgear room, the 480V switchgear room, the main transformer area, and the lube oil storage shed. A 1-1/2 hour rated door and a nonrated door open to the adjacent condensate storage tank area (1-YD-14-4F). Nonrated doors communicate with the yard area (1-YD-14-4D).

Combustibles

The in situ combustible loading in the turbine building ground floor is approximately 110,000 Btu/sq.ft., with an equivalent fire severity of 82 minutes. The in situ loading primarily results from the lube oil within the lube oil reservoir, cable insulation, and miscellaneous plastic, class A combustibles, and 35% solution of hydrazine.

Redundant Equipment

The turbine building ground floor contains the auxiliary feedwater pumps, motor control center 3, and cabling for the following systems used to achieve hot standby and cold shutdown.

- Reactor Coolant System
- Chemical and Volume Control System
- Main Steam System
- Auxiliary Feedwater System
- Component Cooling Water System
- Saltwater Cooling System
- Residual Heat Removal System
- Reactor Cavity Cooling Fans
- Essential Electric Systems

ACTIVE FIRE PROTECTION CAPABILITY

Dectection

Four types of detectors are used to provide coverage of the hazards within the fire zone:

- Cross-zoned infrared flame detectors are installed over the lube oil reservoir pump and conditioner areas.
- Infrared detectors are also installed at the hydrogen seal oil unit and over the emergency air compressor.
- Line type detectors are installed under the lowest cable trays above the lube oil reservoir area.
- Ionization smoke detectors are installed at the lube oil reservoir area and at the south end of the turbine building.

Suppression

Five automatic suppression systems are provided for the protection of the hazard areas within the fire zone:

- An automatic wet pipe sprinkler system is provided for the protection of the chemical feed area.
- An automatic wet pipe sprinkler system is provided for the protection of the chemical treatment area, the east wall and a portion of the south wall of the 480V switchgear room, the north wall of the chemical treatment area, and the structural steel at the north end of the fire zone.
- An aqueous film forming foam system is provided for the lube oil reservoir and conditioner areas. This system is actuated by the cross-zoned infrared detectors installed in this area.
- An automatic water spray system protects the cable trays routed in the north portion of the fire zone near the lube oil and chemical feed areas. This system is actuated by line type heat detectors.
- An automatic water spray system, actuated by infrared detectors, is provided for the protection of the hydrogen seal oil unit at the south end of the turbine building.

Portable fire extinguishers and fire hose stations are available within the fire zone, and in adjacent fire area/zones for manual fire fighting capability.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that full area fire detection and fixed suppression be installed in any area for which dedicated shutdown capability is provided. The technical bases which justify the exemption are detailed below.

1. Cables and equipment for the auxiliary shutdown panel, C-38, will be relocated outside the fire zone, and used as the dedicated shutdown system panel. All dedicated shutdown system components will be located outside the fire zone.

2. Certain components and cables for the dedicated shutdown system will be located in the 480V switchgear room (1-FH-14-7). The turbine building ground floor adjoins the 480V switchgear room at the east and south walls. The south wall of the 480V switchgear room is 3 hour rated. The east wall of the 480V switchgear room is 1 hour rated and is provided with an automatic wet pipe sprinkler system to upgrade the protection of the wall to a 3 hour equivalent rating.

3. The dedicated auxiliary feedwater pump, the dedicated shutdown diesel and electrical systems, and the dedicated shutdown panel will be located at the north west corner of the yard area (1-YD-14-4D), and will remain free of fire damage from a fire in this fire zone, due to the large spatial separation.

4. The plant circuit breakers will be tripped in the control room to deenergize offsite power and prevent and mitigate spurious equipment operation. The operation of the plant circuit breakers can be accomplished at one panel, located near the control room exit, as the operators evacuate the control room. Circuits for the manual trip of the plant circuit breakers are routed outside this fire zone.

5. The charging pump used for dedicated shutdown is located in the reactor auxiliary building lower level (1-AB-(-3)-2A) and will remain free of fire damage from a fire in this fire zone due to the large spatial separation.

6. The steam dump transfer control valve (SV-175) will be relocated from the mezzanine of the turbine building to the turbine deck (1-TB-35-9B), and will remain free of fire damage.

7. Operator action will be taken to manually control certain valves located outside the fire area, in order to initiate dedicated shutdown system operation.

8. Operator action will be taken to manually trip the turbine at the turbine stand on the turbine deck (1-TB-35-9B).

9. Operator action will be taken to manually close the reheater isolation valves, which are located within the fire area, after extinguishment of the fire.

10. The existing fire suppression and detection systems within the fire zone provide protection commensurate with the hazards within the fire zone.

11. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of an alarm.

12. The addition of fire detection or fixed automatic fire suppression system throughout the fire zone would not enhance, to a significant degree, the protection of safe shutdown functions.

FIRE AREA/ZONE: 1-TB-35-9B

TITLE: Turbine Deck

FIGURE: 3-2

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of the redundant trains of the primary system hot leg temperature transmitters within the fire zone does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Alternative hot leg temperature indication is available through the use of the primary system delta T instruments in the control room, or the hot leg temperature instruments at the dedicated shutdown panel. The fire zone does not meet the requirements of Section III.G.3 of Appendix R, in that fire detection and fixed fire suppression systems are not provided throughout the fire zone.

AREA DESCRIPTION

Physical Characteristics

The turbine deck is an exterior fire zone, which consists of the feedwater heater deck, located at elevation 35', and the turbine deck, located at elevation 42'. The walls separating the zone from the control room complex (1-PB-42-16) are 3 hour rated. The north end of the zone adjoins the steel containment sphere. The remainder of the walls separating the zone from other fire area/zones are reinforced concrete or concrete block, with a minimum thickness of 8 inches. The floor of the zone is reinforced concrete. A personnel access hatch and an equipment hatch allow access to containment from the zone. A nonrated sliding metal door and a nonrated rolling metal door communicate with the spent fuel storage room (1-FH-2-5). A nonrated rolling metal door also opens to the new fuel storage room (1-FH-42-6). A 3/4-hour rated door provides access to the south stairwell/locker room (1-PB-20-31B). Louvered ventilation openings communicate with the turbine building ground floor (1-TB-8-9A) and the new fuel storage room.

Combustibles

The in situ combustible loading on the turbine deck is approximately 114 Btu/sq.ft., with an equivalent fire severity of under one minute. The in situ loading consists of oil and grease from the turbine lube oil system and the overhead crane.

Redundant Equipment

The turbine deck contains the turbine stop valves and cabling for the following redundant equipment used to achieve hot standby and cold shutdown:

- Pressurizer pressure transmitter
- Primary system hot leg temperature transmitters
- Turbine stop valves
- Motor driven auxiliary feedwater pump
- Steam driven auxiliary feedwater pump
- Auxiliary feedwater flow control valves

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Ionization smoke detectors are located within the high pressure turbine housing.

Suppression

Portable fire extinguishers and six fire hose stations are available within the fire zone for manual fire fighting capability.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50, Appendix R, Section III.G.3, which requires that full area fire detection and fixed suppression be installed in any area for which alternative or dedicated shutdown capability is provided. The technical bases which jusitfy the exemption request are detailed below.

1. Alternative shutdown capability is provided outside the fire zone, should a fire occur on the turbine deck.

2. The combustible loading in the fire area results in an equivalent fire severity of under one minute.

3. Combustible gases and heat generated by a fire in the zone would be dissipated to the atmosphere.

4. Ionization smoke detectors are provided in the high pressure turbine housing to provide early warning of a turbine lube oil fire.

5. Portable fire extinguishers and fire hose stations are immediately available for manual fire fighting purposes.

6. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the alarm.

7. Operator action may be taken to locally control certain equipment located outside the fire zone.

8. Operator action may be taken to manually trip the turbine at the turbine stand.

9. The addition of full area fire detection or fixed automatic suppression system would not enhance, to a significant degree, the protection of safe shutdown functions.

TITLE: Control Room Complex

FIGURE: 3-2

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of redundant trains of safe shutdown equipment within the fire area does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Dedicated shutdown capability has been provided for use in the event of a fire in this fire area. The fire area does not meet the requirements of Section III.G.3 of Appendix R in that partial area fire detection is provided in the fire area, and a fixed fire suppression system is not provided in the fire area.

AREA DESCRIPTION

Physical Characteristics

The control room is located at elevation 42' on the third floor of the power block building. The floor and walls of the fire area are 3 hour rated. A suspended acoustical tile ceiling is provided throughout the area, except in the back panel area. The roof of the control room is concrete with an approximate thickness of 7-1/2 inches. The control room is separated from the north stairwell (1-PB-20-29), the chemical control laboratory, and the south stairwell (1-PB-42-30A) by 3 hour rated doors. Ventilation penetrations in the floor and walls are provided with 3 hour rated fire dampers.

Combustibles

The in situ combustible loading in the control room is approximately 78,850 Btu/sq.ft., with an equivalent fire severity of 60 minutes. The in situ loading is composed primarily of cable insulation, paper in books, computer paper, drawing files, wood in desks and other office furniture, and plastic in respirators and office fixtures.

Redundant Equipment

The control room complex contains the control consoles, vital bus cabinets and cabling for the following systems used to achieve hot standby and cold shutdown:

- Reactor Coolant System
- Chemical and Volume Control System
- Main Steam System
- Auxiliary Feedwater System
- Component Cooling Water System
- Saltwater Cooling System
- Residual Heat Removal System
- Diesel Generator Systems
- Essential Electric Systems

ACTIVE FIRE PROTECTION CAPABILITY

Detection

Ionization smoke detectors are provided in the technical support center, the back panel area, the kitchen, and the computer room. For additional protection, ionization smoke detectors are also located within the vital bus cabinet and the main control console.

Suppression

Portable fire extinguishers, and a fire hose station are available within the control room complex for manual fire fighting capability. Additional extinguishers and an additional fire hose station are available from adjacent areas outside the control room complex.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3., which requires that full area fire detection and fixed suppression be installed throughout any area for which dedicated shutdown capability is provided. The technical bases which justify the exemption request are detailed below.

1. Dedicated shutdown capability is provided outside the fire area, should a fire occur in the control room complex.

2. The control room complex walls and floor are 3 hour rated barriers.

3. The combustible loading in the fire area results in an equivalent fire severity of 60 minutes.

4. Portable fire extinguishers and manual fire hose stations are provided for manual fire fighting purposes.

5. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the first alarm.

6. The area is constantly manned by operations personnel; therefore any fire in the control panel or support areas would be detected by visual observation. Additional early warning alarm is provided by ionization detectors installed in the technical support center, back panel area, the kitchen, the computer room, and within the vital bus cabinet and the main control console.

7. Inadvertent actuation of an automatic suppression system in the control room complex may cause equipment damage or force control room personnel to evacuate the control room.

8. The plant circuit breakers will be tripped to deenergize offsite power and prevent/mitigate spurious equipment operation. The operation of the plant circuit breakers can be accomplished at one panel, located near the control room exit, as the operators evacuate the control room.

9. Operator action will be taken to locally control certain valves located outside the fire area, in order to initiate dedicated shutdown system operation.

10. Operator action will be taken to manually trip the turbine at the turbine stand.

11. The addition of a fixed automatic suppression and the installation of a fire detection system to provide coverage of the entire fire area would not enhance, to a significant degree, the protection of safe shutdown functions.

FIRE AREA/ZONE: 1-PB-56-33

TITLE: Power Block Roof

FIGURE: 3-2

DESCRIPTION OF DEVIATION

Statement of Problem

The separation of the redundant trains of the primary system hot leg temperature transmitters within the fire area does not meet the requirements of 10CFR50 Appendix R, Section III.G.2. Alternative hot leg temperature indication is available through the use of the primary system delta T instruments in the control room, or the use of the hot leg temperature indicators at the dedicated shutdown panel. The fire area does not meet the requirements of Section III.G.3 of Appendix R, in that full area fire detection and fixed fire suppression systems are not provided in the fire area.

AREA DESCRIPTION

Physical Characteristics

This fire area consists of the power block roof at elevation 56', and is located directly above the control room. The roof is constructed of reinforced concrete with a minimum thickness of 7-1/2 inches. The roof slab is covered by built up roofing on 1/2 inch insulation. The area is accessed via a ladder on the east side of the power block roof.

Combustibles

There are no in situ combustibles within the fire area.

Redundant Equipment

The power block roof contains cabling for the following redundant equipment used to achieve hot standby and cold shutdown:

- Primary system hot leg temperature instrumentation
- Pressurizer pressure transmitters
- Auxiliary feedwater flow control valves

ACTIVE FIRE PROTECTION CAPABILITY

Detection

There is no fire detection equipment installed in this area.

Suppression

A portable fire extinguisher is available on the power block roof for manual fire fighting capability. Additional manual fire fighting capability is available from the fire department portable equipment.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50, Appendix R, Section III.G.3, which requires that full area fire detection and fixed suppression be installed in any area where alternative or dedicated shutdown capability is provided. The technical bases which justify the exemption are detailed below.

1. Alternative shutdown capability is provided outside the fire area, should a fire occur on the power block roof.

2. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of ifve certified fire fighters are on duty per shift. The first arriving fire fighters under normal circumstances can be expected to be onscene within five minutes of the receipt of the alarm.

3. There is no combustible loading in the fire area.

4. Combustible gases and heat generated by a fire in the area would be dissipated to the atmosphere.

5. Operator action will be taken to locally control the auxiliary feedwater flow control valves which are located in the yard area (1-YD-14-4D).

6. The addition of full area fire detection or fixed fire suppression would not enhance, to a significant degree, the protection of safe shutdown functions.

DESCRIPTION OF DEVIATION

Statement of Problem

In the event normal control room control of certain valves is impaired by fire, operator action will be taken to manually control these valves, or to control manual valves in the process line. Specific fire area/zones in which manual actions may be required as a result of fire are listed in Table 1. These fire area/zones do not meet the requirements of 10CFR50 Appendix R, Section III.G.3 in that full area fire detection and fixed fire suppression is not provided in these fire zones.

BASES FOR EXEMPTION

An exemption is requested to 10CFR50 Appendix R, Section III.G.3, which requires that full area fire detection and fixed fire suppression be installed in any fire area for which alternate or dedicated shutdown capability is provided. The technical bases which justify the exemption request are detailed below.

1. The manual actions do not require that the component be repaired or replaced. The manual actions which are required in the event of fire in each fire area/zone are detailed in the 10CFR50 Appendix R Section III.G Compliance Evaluation. Table 1 provides a summary of combustible loading, and fire protection capability for each area/zone where manual actions may be required in the event of fire.

2. The time required to perform each manual action is being evaluated to assure that adequate time and manpower will be available.

3. As shown in Table 1, portable extinguishers or fire hose stations are available for manual fire fighting capability in each fire area/zone.

4. The San Onofre Fire Department consists of professionally trained, full time personnel whose primary responsibility is fighting fires at San Onofre. The Fire Department is certified by the State of California Fire Marshall's office to provide fire suppression activities. A minimum of five certified fire fighters are on duty per shift. The first arriving fire fighters can be onscene within five minutes of the receipt of the alarm.

5. The addition of fire detection and fixed fire suppression throughout these fire area/zones would not enhance, to a significant degree, the protection of safe shutdown functions.

TABLE 1

FIRE AREA/ZONE	COMBUSTIBLE LOADING Btu/sq.ft.	EQUIVALENT FIRE SEVERITY Minutes	FIRE DETECTION	SUPPRESSION	MANUAL ACTIONS SUMMARY (1)
1-AB-20-2N	8,300	6	None	Hose stations	Control certain valves located within the fire zone.
1-AB-11-34	12,000	9	Ionization detectors	Hose stations Portable extinguishers	Control certain valves located outside the fire area.
1-YD-20-4C	0	0	Ionization detectors to be installed	Hose stations Portable extinguishers	Control certain valves located within the fire zone.
1-YD-14-4F	372,000	280	None	Hose stations Portable extinguishers	Trip offsite power breakers at 4160V switchgear room.
1-TB-20-9D	746,900	560	None	Fire hydrants Portable extinguishers	Control certain valves located outside the fire zone.
1-PB-20-11A	8,900	7	Local ionization detectors	Hose stations Portable extinguishers	Control certain valves located outside the fire zone.
1-PB-20-12	59,200	45	Local ionization detectors	Hose stations Portable extinguishers	Control certain valves located outside the fire zone.
1-PB-20-13A	36,500	28	Ionization detectors	Fire hydrants Portable extinguishers	Control certain valves located outside the fire zone.

TABLE 1

FIRE AREA/ZONE	COMBUSTIBLE LOADING Btu/sq.ft.	EQUIVALENT FIRE SEVERITY Minutes	FIRE DETECTION	SUPPRESSION	MANUAL ACTIONS SUMMARY (1)
1-PB-20-13C	1,365	1	None	Portable extinguishers	Control certain valves located outside the fire zone.
1-PB-14-25	270,600	203	Ionization detector	Portable extinguishers Hose stations	Control certain valves located outside the fire zone.

(1) Specific equipment requiring manual actuation is identified in the San Onofre Nuclear Generating Station Unit 1 10CFR50 Appendix R Compliance Evaluation.