

Davis-Besse Unit 1 Fire Hazard Analysis Report

DAVIS-BESSE NUCLEAR POWER STATION UNIT NO. 1

SECTION 8.0

OPERATING SPECIFICATIONS

8.0 Operating Specifications

The Fire Protection related Technical Specifications were relocated to this Operating Specification section via License Amendment 174.

8.1 Appendix R Fire Protection FUNCTIONALITY/SURVEILLANCE REQUIREMENTS

This section defines the FUNCTIONALITY/SURVEILLANCE REQUIREMENTS for the area fire detection systems, automatic suppression systems, and fire barriers provided for protection of the FHAR fire areas that contain redundant (both trains) safe shutdown equipment needed in the event of a fire (e.g., necessary to meet the applicable portions of 10CFR50, Appendix R). This section was developed based on a detailed review of the FHAR, Appendix R exemption requests, safety evaluation reports, and engineering evaluations (i.e., Generic Letter (GL) 86-10 evaluations and NFPA code evaluations). The manual fire suppression systems such as hose stations/connections, hydrants and hydrant hose houses are addressed in Section 8.2 which discusses those necessary to meet BTP APCS 9.5-1, Appendix A commitments.

To ensure the reliability and effectiveness of plant fire protection systems and equipment, fire protection systems are maintained and tested by qualified personnel with proper training. Each Surveillance Requirement shall be performed within the specified time interval with a maximum allowable extension of 25 percent of the surveillance interval. When a fire protection system component identified in this section is determined to be not functional, the compensatory measures shall be as described in the ACTION statements.

8.1.1 Fire Detection

OPERATING REQUIREMENT

As a minimum, the fire detection instrumentation for each fire detection zone in Table 8-1 shall be FUNCTIONAL.

APPLICABILITY

Whenever equipment or circuitry in that fire detection zone is required to be FUNCTIONAL.

ACTION

- A. With the number of FUNCTIONAL fire detection instruments less than the minimum number FUNCTIONAL requirements of Table 8-1:

Within one hour, establish a fire watch to inspect the zone(s) with the not functional instrument(s) at least once per hour; except:

- 1) If the instrument(s) is located inside the Containment, then within one hour, establish a fire watch to inspect the zone(s) at least once per eight hours or monitor the Containment air temperature at least once per hour utilizing the inlet temperature of one of the operating Containment air coolers. The fire detection instruments located within the Containment are not required to be FUNCTIONAL during the performance of Type A Containment leakage rate tests.

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- 2) If the instrument(s) is located inside the Containment annulus, then within eight hours, establish a fire watch to inspect the zone(s) at least once per eight hours during MODES 3, 4, 5, 6 or defueled. During MODES 1 or 2, due to ALARA concerns, alternative measures shall be implemented.
- B. If the fire detection zone(s) alarm circuit(s) between the local panel and the Control Room is not functional, then inspect the local panel(s) of the affected functional fire detection zone(s) at least once per hour.

SURVEILLANCE REQUIREMENTS

- A. Each of the above required fire detection instruments shall be demonstrated FUNCTIONAL by performance of a CHANNEL FUNCTIONAL TEST;
- 1) At least once per twelve months for smoke detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible),
 - 2) At least once per twelve months for flame detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible),
 - 3) At least once per twelve months for thermal detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible).
- B. The ground fault detection associated with the detector alarms of each of the above required fire detection instruments shall be demonstrated FUNCTIONAL at least once per twelve months by performance of a CHANNEL FUNCTIONAL TEST.

BASES

FUNCTIONALITY of the Appendix R related 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 redundant safe shutdown equipment required in the event of a fire and is an integral element in the overall DNBPS fire protection program.

The number of FUNCTIONAL instruments in certain fire detection zones may be less than the number of installed instruments by approximately 10 percent without significantly reducing the effectiveness of the system as long as no two adjacent instruments are not functional. Table 8.1 specifies the minimum number of FUNCTIONAL instruments necessary for the zone to be considered FUNCTIONAL. The increased time delay for detection of a fire in the fire detection zones allowed to operate with a reduced number of instruments would be minimal since the typical power plant fire (cable insulation or oil) produces large amounts of smoke which would quickly spread and be detected by the remaining instruments.

In the event that a portion of the required fire detection instrumentation is not functional, monitoring the affected areas, as specified in the ACTION statements above, is required to provide detection capability until the not functional instrumentation is restored to FUNCTIONALITY. If the affected area is inaccessible, then alternate compensatory measures are taken. The measures could include 8-hr watches, video cameras, temperature monitoring

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or other means determined to be adequate by the Fire Protection Engineer. The Containment annulus area has locked access doors at the opening such that access within one hour of determination of not functional fire detection is physically impractical. Therefore, a longer access time consistent with the inspection interval of eight hours was established.

In the event the fire detection zone(s) alarm circuit(s) between the local panel and the Control Room is not functional, an hourly inspection at the affected local panel is specified. The fire detection zone(s) on the affected local panel that is FUNCTIONAL at the time of the circuit failure to the Control Room is considered functional for the purpose of the local panel inspection.

All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). All eight hour fire watches or monitoring shall be performed at intervals of eight hours with a margin of two hours (+ two hours). The use of any part of the fifteen minute or two hour margin does not alter the schedule for any subsequent hourly or eight hour fire watch, respectively. Rooms that are continuously staffed or are visible to the continuously staffed area do not require a separate fire watch since the personnel normally in the area serve that function. For fire detection the only area this would apply is the Control Room area (FDZ 505 including Rooms 502, 504, 505, 506, 507, 511 and 512 which are visible from the continuously staffed area, but excluding Rooms 503, 510 and 513 which are not visible from the continuously staffed area).

8.1.2 Fire Suppression Water System

OPERATING REQUIREMENTS

The fire suppression water system shall be FUNCTIONAL with:

- A. Two FUNCTIONAL fire suppression pumps with their discharge aligned to the fire suppression header.
- B. An OPERABLE Ultimate Heat Sink.
- C. An FUNCTIONAL Fire Water Storage Tank.
- D. An FUNCTIONAL flow path capable of taking suction from the Ultimate Heat Sink or the Fire Water Storage Tank and transferring water through distribution piping with FUNCTIONAL sectionalizing valves to the yard fire hydrant curb valves and the first valve ahead of the water flow alarm device on each sprinkler, deluge system and fire hose station/connection standpipe required to be FUNCTIONAL per Sections 8.1.3, 8.2.2 and 8.2.3.

APPLICABILITY

At all times.

ACTION

- A. With the Fire Water Storage Tank or the Ultimate Heat Sink not functional or not OPERABLE (respectively), confirm the FUNCTIONALITY or OPERABILITY (respectively) of the alternate water supply within one hour and every 24 hours thereafter.

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- B. With either one of the fire pumps not functional, verify the FUNCTIONALITY of the remaining pump within 24 hours and every seven days thereafter.
- C. With the fire suppression water system otherwise not functional, establish a backup fire suppression system within 24 hours. Otherwise, action shall be taken within one hour to be in hot standby within six hours, hot shutdown within the following six hours, and cold shutdown within the subsequent 24 hours.

SURVEILLANCE REQUIREMENTS

- A. The Fire Water Storage Tank shall be demonstrated FUNCTIONAL:
 - 1) By verifying the available water supply is at least 250,000 gallons (water level of at least 30 feet) at least once per seven days.
 - 2) By verifying the temperature of the contained water supply is greater than 35°F every 24 hours during October through March.
- B. The Ultimate Heat Sink shall be demonstrated OPERABLE in MODES 5, 6 and defueled at least once per seven days by verifying its water level is at or above 562.0 feet International Great Lakes Datum and an average water temperature of $\leq 90^{\circ}$ F.
- C. The fire suppression water system shall be demonstrated FUNCTIONAL:
 - 1) At least once per 92 days by verifying that each manual valve and sectionalizing valve in the flow path is in its correct position.
 - 2) At least once per 12 months by performance of a system flush.
 - 3) At least once per 12 months by cycling each valve in the flow path, excluding check valves, through at least one complete cycle of full travel.
 - 4) At least once per five years by performing a flow test of the system to determine that the condition of the system distribution piping is adequate to provide needed system demand.
- D. The electric motor driven fire pump shall be demonstrated FUNCTIONAL:
 - 1) At least once per 31 days on a STAGGERED TEST BASIS with Surveillance Requirement E.1 below by starting the electric motor driven fire pump and operating for at least 15 minutes.
 - 2) At least once per operating cycle by verifying the electric motor driven fire pump starts automatically on a decreasing fire suppression water system pressure of at least 115 psig and maintains the fire suppression water system pressure ≥ 95 psig.
 - 3) At least once per operating cycle by verifying the electric motor driven fire pump develops at least 2500 gpm at a system head of 277 feet discharge pressure.

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- E. The diesel driven fire pump shall be demonstrated FUNCTIONAL:
- 1) At least once per 31 days on a STAGGERED TEST BASIS with Surveillance Requirement D.1 above by starting the diesel driven fire pump from ambient conditions and operating it for at least 30 minutes on recirculation flow.
 - 2) At least once per 31 days by verifying Fire Pump Diesel Day Tank contains at least 171 gallons of fuel (fuel level of at least 18.6 inches).
 - 4) At least once per operating cycle by verifying the diesel driven fire pump starts automatically (after the sequence starting relay has timed out) and maintains fire suppression water system pressure ≥ 95 psig, from:
 - 1) ambient conditions on decreasing fire suppression water system pressure of at least 95 psig, 2) simulated decreasing Fire Water Storage Tank level of at least three feet and 3) loss of power to the diesel driven fire pump controller.
 - 5) At least once per operating cycle by verifying the diesel fire pump develops at least 2500 gpm at a system head of 277 feet discharge pressure.
 - 6) At least once per operating cycle by subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendation for the class of service.
 - 7) At least once per 61 days by verifying the electrolyte level of each cell is above the plates, and overall voltage of the diesel driven fire pump battery bank when not discharging is greater than or equal to 24 volts.
 - 8) At least once per 92 days by verifying that the specific gravity of each diesel driven fire pump starting battery is appropriate for continued service of the battery.
 - 9) At least once per 18 months by verifying that the diesel driven fire pump starting batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.
 - 10) At least once per 18 months by verifying that the battery-to-battery and terminal connections of each diesel driven fire pump starting battery are clean, tight, free of corrosion and coated with anti-corrosion material.

BASES

See Section 8.1.3 below

8.1.3 Sprinkler/Water Curtain Deluge Systems

OPERATING REQUIREMENT

The sprinkler and water curtain deluge systems listed in Table 8-2 shall be FUNCTIONAL.

APPLICABILITY

Whenever equipment or circuitry in the sprinkler/water curtain deluge protected areas is required to be FUNCTIONAL.

ACTION

- A. With one or more of the above required sprinkler systems not functional, within one hour establish continuous fire watch with backup fire suppression equipment as required by the plant procedures for those areas in which redundant safe shutdown systems or components could be damaged as noted In Table 8-2; for the other areas establish an hourly fire watch to inspect the affected area(s).
- B. With one or more of the above required water curtain deluge systems not functional, within one hour either:
 - 1) Establish a continuous fire watch on at least one side of the affected fire barrier, or
 - 2) Verify the FUNCTIONALITY of the fire detection zone on at least one side of the affected fire barrier and establish an hourly fire watch.

SURVEILLANCE REQUIREMENTS

- A. Each of the above required sprinkler/water curtain deluge systems shall be demonstrated FUNCTIONAL:
 - 1) At least once per 92 days by verifying that each manual and automatic valve, excluding check valves, in the flow path is in its correct position.
 - 2) At least once per 12 months by cycling each valve, excluding check valves, in the flow path through at least one complete cycle of full travel.
 - 3) At least once per operating cycle by performing a system functional test which includes simulated automatic actuation of the system and verifying that the automatic valves in the flow path, excluding check valves, actuate to their correct positions.
 - 4) At least once per operating cycle by a visual inspection of the water curtain deluge system headers to verify their integrity.
 - 5) At least once per operating cycle by a visual inspection of each nozzle's spray area to verify the spray pattern is not obstructed.
 - 6) At least once per five years by performing an air-flow test through each water curtain deluge header and verifying each deluge spray nozzle is unobstructed.

BASES

The FUNCTIONALITY of the Appendix R related fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in those portions of the facility containing redundant safe shutdown equipment required in the event of a fire. The fire suppression systems consist of the water supply system, sprinkler systems and water curtain deluge systems. The collective capability of the fire suppression systems is adequate to minimize potential damage to redundant safe shutdown equipment required in the event of a fire and is a major element in the DBNPS fire protection program.

The Ultimate Heat Sink is confirmed OPERABLE in MODES 1, 2, 3 and 4 per Technical Specification 3/4.7.5 and requires plant shutdown if it is inoperable. Therefore, the only additional action or surveillance specified in the Operating Specifications addresses MODES 5, 6, and defueled. The Ultimate Heat Sink level of 562.0 feet or above is maintained consistent in MODES 5, 6 and defueled with the Technical Specification 3/4.7.5 requirement, even though this is above the level needed for diesel driven fire pump FUNCTIONALITY. The intake forebay level necessary for proper priming and/or operation of the diesel driven fire pump at 150 percent design capacity, is 548'-10" at a water temperature of $\leq 90^{\circ}$ F. In order to minimize the introduction of additional surveillance requirements the conservative single value for diesel driven fire pump FUNCTIONALITY of 562.0 feet was chosen, since this value is already assured in MODES 1, 2, 3 and 4. No lower forebay temperature limit needs to be specified for diesel fire pump operability because the pump impeller is located well below the level the water will freeze to. The diesel fire pump is operable at low temperatures as long as it is pumping water.

With one or more sectionalizing valves of the plant yard loop closed, Section 8.1.2 Operating Requirements are met provided a flow path from the plant yard loop is maintained to the yard hydrant curb valves and the first valve ahead of the water flow alarm device on each sprinkler, water curtain, hose standpipe or system riser required to be FUNCTIONAL. A FUNCTIONAL flow path does not necessarily require a completed plant yard loop as long as the loss of fire suppression water is to systems not addressed by Sections 8.1.3, 8.2.2, 8.2.3, and 8.2.4.

The fire suppression water system flow path is defined as the path from the pump suction to the first valve ahead of the water flow alarm device on each sprinkler, water curtain, hose standpipe or system riser and does not include vents and drains or other system branches. The sprinkler/water curtain deluge system flow path is defined as the path from the fire suppression water system to the last sprinkler/deluge nozzle in the line and does not include vents, drains, inspector test connections or other system branches not leading to sprinklers or deluge nozzles.

Surveillance Requirement E.2 of the Fire Suppression Water System ensures that there is an adequate fuel supply in the day tank to operate the diesel driven fire pump for eight hours.

Surveillance Requirement E.4 of the Fire Suppression Water System ensures sequential starting of the diesel driven fire pump after the electric motor driven fire pump.

In the event that portions of the fire suppression systems are not functional, compensatory measures are required until the not functional equipment is restored to service. A backup fire suppression water system may consist of a local fire department pumper, backup pump or any other system(s) allowed by plant procedures or determined by the Fire Protection Engineer to be adequate. If a backup fire suppression water system is not available within 24 hours, a plant shutdown is initiated. This is required due to the severe consequences that would result

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from inability to limit fire spread without a suppression water supply system. A backup sprinkler/water curtain deluge system may consist of portable extinguishers, additional fire hoses or any other system(s) allowed by plant procedures or determined by the Fire Protection Engineer to be adequate.

All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). A continuous fire watch requires that a fire watch be in the specified area at least once every fifteen minutes with a margin of five minutes (+ five minutes). The use of any part of the fifteen minute or five minute margin does not alter the schedule for any subsequent hourly or continuous (fifteen minute) fire watch, respectively.

The water curtain deluge systems identified in Table 8-2 provide a fire barrier and are not intended for fire suppression. The water curtain deluge systems are included in the above sections due to Surveillance Requirements common with the sprinkler systems. Separate ACTION statements are specified for the water curtain deluge systems.

8.1.4 Fire Barriers

OPERATING REQUIREMENT

All fire barriers separating portions of redundant safe shutdown systems required in the event of a fire shall be FUNCTIONAL.

APPLICABILITY

At all times.

ACTION

- A. With one or more of the above fire barriers not functional, except in the Containment or Containment annulus, within one hour, either:
 - 1) Establish a continuous fire watch on at least one side of the affected fire barrier, or
 - 2) Verify the FUNCTIONALITY of the fire detectors on at least one side of the affected fire barrier and establish an hourly fire watch.

- B. With one or more of the above fire barriers not functional in the Containment or Containment annulus, then
 - 1) If the fire barrier(s) is located inside the Containment then within one hour, establish a fire watch to inspect one side of the affected fire barrier at least once per eight hours or monitor the Containment air temperature at least once per hour utilizing the inlet temperature of one of the operating Containment air coolers, or
 - 2) If the fire barrier(s) is located inside the Containment annulus, then within eight hours, establish a fire watch to inspect one side of the affected fire barrier at least once per eight hours during MODES 3, 4, 5, 6 or defueled. During MODES 1 or 2, due to ALARA concerns, alternative measures shall be implemented.

SURVEILLANCE REQUIREMENTS

Each of the above required fire barriers, including sealing devices, shall be verified FUNCTIONAL by:

- A) Performing a visual inspection of the exposed surfaces of each fire-rated wall¹, floor and ceiling, electrical raceway fire enclosure and structural steel fire-proofing at least once per 18 months. (24 months if located in the Containment, Containment Annulus or are otherwise inaccessible).
- B) Performing a visual inspection of each fire door, fire damper and associated hardware at least once per 18 months.
- C) Performing a visual inspection of at least ten percent⁶ of each type of sealed penetration at least once per 18 months. (24 months if located in the Containment, Containment Annulus or are otherwise inaccessible). If the penetration(s) is determined to be not functional, declare the affected penetration(s) not functional and perform a visual inspection of an additional ten percent of the degraded type of sealed penetration unless an engineering review determines the failure to be unique to this penetration. If the engineering evaluation does not determine it to be unique the inspection process shall continue until a ten percent sample with no visually apparent adverse changes in appearance or changes from the as-built condition are found or until all required sealed penetrations of the degraded type have been inspected. Samples shall be selected such that each penetration seal will be inspected at least once per 15 years.
- D) Verifying at least once per 24 hours each fire door² (i) that is unlocked is closed or (ii) that is equipped with an automatic hold-open and release mechanism is free from obstruction.
- E) Verifying at least once per seven days each locked fire door² is closed and locked.
- F) Performing a functional test that verifies the operation of door automatic hold-open and release mechanisms upon full openings, and latch and closing mechanisms upon full and partial openings, at least once per 18 months.

BASES

The FUNCTIONALITY of the Appendix R related fire barrier ensures that fires will be confined or adequately retarded from spreading to adjacent fire areas or to portions of redundant safe shutdown systems required in the event of a fire within the fire area. This design feature minimizes the possibility of a single fire rapidly involving several fire areas of the DBNPS prior to detection and extinguishment. The fire barriers are passive elements in the DBNPS fire protection program.

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- 1. Barriers that are inaccessible (one side or both' sides) due to ALARA considerations are not subject to the requirements for visual inspection.
 - 2. These requirements do not apply to elevator doors.
 - 6. A one-time exception was made for the GFS-1 seal type to not continue doing the 10% samples as required by surveillance requirement C. Reference Safety Evaluation 94-043.

Fire barriers, including sealing devices, fire doors, electric raceway enclosures, structural steel fireproofing and dampers, are considered FUNCTIONAL when the visually observed condition is the same as the as-designed condition. The as-designed condition of each fire barrier is based on a tested configuration or a configuration analyzed to withstand the fire hazards associated with the fire area. For those fire barriers that are not in the as-designed condition, an evaluation shall be performed to show that the fire rating of the fire barriers is not degraded and that the barrier is FUNCTIONAL or the ACTION statement shall be entered. A one-sided inspection of barriers is permitted when physical constraints or ALARA considerations (defined as the barrier being inside a high radiation area (> 100 mrem/hour exposure to personnel) regardless of plant operational status) render the opposite side inaccessible. For these barriers, the inaccessible side is considered to be unexposed for inspection. Any barrier that requires equipment to be unbolted or dismantled, destruction of a covering surface, or use of cranes or hoists to remove plugs to gain access is also considered to be unexposed.

Where grout has been used to seal an opening in a fire barrier (i.e. GFS-1 and GFS-2), these are considered to be part of the barrier and are not considered a "type of sealed penetration." These will continue to be looked as part of the overall fire barrier in Surveillance Requirement A.

When a penetration is found to be inoperable, another ten percent sample of that seal type is appropriate unless an engineering evaluation determines that the failure is unique to that seal. Thus other seals in that seal type would not be expected to see the same failure mechanism.

In the event that a fire barrier, seal, door, raceway enclosure, structural steel fireproofing or damper is not functional, monitoring the affected areas, as specified in the ACTION statements above, is required. If the affected area is inaccessible, then alternate compensatory measures are taken. The measures could include 8 hr watches, video cameras, temperature monitoring or other means determined to be adequate by the Fire Protection Engineer. The Containment annulus area has locked access doors at the opening such that access within one hour of determination of not functional fire detection is physically impractical. Therefore, a longer access time consistent with the inspection interval of eight hours was established.

All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). A continuous fire watch requires that a fire watch be in the specified area at least once every fifteen minutes with a margin of five minutes (+ five minutes). The use of any part of the fifteen minute or five minute margin does not alter the schedule for any subsequent hourly or continuous (fifteen minute) fire watch, respectively. Rooms that are continuously staffed or are visible to the continuously staffed area do not require a separate fire watch since the personnel normally in the area serve that function. For fire barriers the only area this would apply is the Control Room area (Rooms 502, 504, 505, 506, 507, 511 and 512).

8.2 Appendix A Fire Protection FUNCTIONALITY/SURVEILLANCE REQUIREMENTS

This section defines the FUNCTIONALITY/SURVEILLANCE REQUIREMENTS for the area fire detection systems, sprinkler/deluge systems, hose stations/connections, hydrants, hydrant house houses and fire barriers provided for protection of the FHAR fire areas that are defined as BTP APCSB 9.5-1, Appendix A areas. This section was developed based on a detailed review of the FHAR, safety evaluation reports, and engineering evaluations (i.e., GL 86-10 evaluations and NFPA code evaluations). For each area where automatic suppression systems are required by the evaluation for this section as well as Section 8.1, the backup manual fire hose station(s) or hydrant(s) was included.

To ensure the reliability and effectiveness of plant fire protection systems and equipment, fire protection systems are maintained and tested by qualified personnel with proper training. Each Surveillance Requirement shall be performed within the specified time interval with a maximum allowable extension of 25 percent of the surveillance interval. When a fire protection system component identified in this section is determined to be not functional the compensatory measures shall be as described in the ACTION statement.

8.2.1 Fire Detection

OPERATING REQUIREMENT

As a minimum, the fire detection instrumentation for each fire detection zone in Table 8-3 shall be FUNCTIONAL.

APPLICABILITY

Whenever equipment or circuitry in that fire detection zone is required to be FUNCTIONAL.

ACTION

- A. With the number of FUNCTIONAL fire detection instruments less than the minimum number FUNCTIONAL requirements of Table 8-3:

Within one hour, either confirm as FUNCTIONAL the sprinkler/deluge system per Section 8.2.2 in the affected area(s), or establish a fire watch to inspect the zone(s) with the not functional instrument(s) at least once per hour; except:

- 1) If the instrument(s) is located inside the Containment, then within one hour, establish a fire watch to inspect the zone(s) at least once per eight hours or monitor the Containment air temperature at least once per hour utilizing the inlet temperature of one of the operating Containment air coolers. The fire detection instruments located within the Containment are not required to be FUNCTIONAL during the performance of Type A Containment leakage rate tests.
- 2) If the instrument(s) is located inside the Containment annulus, then within eight hours, establish a fire watch to inspect the zone(s) at least once per eight hours during MODES 3, 4, 5, 6 or defueled. During MODES 1 or 2, due to ALARA concerns, alternative measures shall be implemented.
- 3) If the instrument(s) is located inside the main steam line rooms (Rooms 600, 601, and 602), then within one hour, establish a fire watch to inspect the zone(s) at least once per eight hours.
- 4) If the instrument(s) is located in fire detection zone(s) 318 or 319, the associated pre-action sprinkler system is not functional and the ACTION statement of Section 8.2.2 applies.

- B. If the fire detection zone(s) alarm circuit(s) between the local panel and the Control Room is not functional, then inspect the local panel(s) of the affected functional fire detection zone(s) at least once per hour.

SURVEILLANCE REQUIREMENTS

- A. Each of the above required fire detection instruments shall be demonstrated FUNCTIONAL by performance of a CHANNEL FUNCTIONAL TEST:
 - 1. At least once per twelve months for smoke detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible),
 - 2. At least once per twelve months for flame detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible),
 - 3. At least once per twelve months for thermal detectors (24 months if located in the Containment, Containment annulus or are otherwise inaccessible).
- B. The ground fault detection associated with the detector alarms of each of the above required fire detection instruments shall be demonstrated FUNCTIONAL at least once per twelve months by performance of a CHANNEL FUNCTIONAL TEST.

BASES

FUNCTIONALITY of the Appendix A related 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 redundant safe shutdown equipment required in the event of a fire and is an integral element in the overall DBNPS fire protection program.

The number of FUNCTIONAL instrument(s) in certain fire detection zones may be less than the number of installed instruments by approximately 10 percent without significantly reducing the effectiveness of the system as long as no two adjacent instruments are not functional. Certain fire detection zones were installed with redundant instruments which allow for up to a 50 percent reduction in FUNCTIONAL instruments while maintaining the zone FUNCTIONAL. Table 8-3 specifies the minimum number of FUNCTIONAL instruments necessary for the zone to be considered FUNCTIONAL. The increased time delay for detection of a fire in the fire detection zones allowed to operate with a reduced number of instruments would be minimal since the typical power plant fire (cable insulation or oil) produces large amounts of smoke which would quickly spread and be detected by the remaining instruments.

In the event that a portion of the required fire detection instrumentation is not functional, monitoring the affected areas, as specified in the ACTION statements above, is required to provide detection capability until the not functional instrumentation is restored to FUNCTIONALITY. The use of FUNCTIONAL sprinkler/deluge systems for compensatory measures provides flow alarm indication to the Control Room directly. If the affected area is inaccessible, then alternate compensatory measures are taken. The measures could include 8 hr watches, video cameras, temperature monitoring or other means determined to be adequate by the Fire Protection Engineer. The Containment annulus area has locked access doors at the opening such that access within one hour is physically impractical. Therefore, a longer access time consistent with the inspection interval of eight hours was established. The main steam line

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rooms were given similar compensatory measures to the Containment due to personnel hazards in the area if a plant trip were to occur.

In the event the fire detection zone(s) alarm circuit(s) between the local panel and the Control Room is not functional, an hourly inspection at the affected local panel is specified. The fire detection zone(s) on the affected local panel that is FUNCTIONAL at the time of the circuit failure to the Control Room is considered functional for the purpose of the local panel inspection.

All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). All eight hour fire watches or monitoring shall be performed at intervals of eight hours with a margin of two hours (+ two hours). The use of any part of the fifteen minute or two hour margin does not alter the schedule for any subsequent hourly or eight hour fire watch, respectively.

Certain fire detection instrumentation automatically actuates fire suppression systems. These fire detection instruments are included in Table 8-3 due to Surveillance Requirements common with other fire detection instrumentation.

8.2.2 Sprinkler/Deluge System

OPERATING REQUIREMENTS

The sprinkler and deluge systems listed in Table 8-4 shall be FUNCTIONAL.

APPLICABILITY

Whenever equipment or circuitry in the sprinkler/deluge protected areas is required to be FUNCTIONAL.

ACTION

- A. With one or more of the above required sprinkler/deluge systems not functional, within one hour establish an hourly fire watch to inspect the affected area(s) that contain significant combustible loading within the plant structures; or if the area does not contain significant combustible loading within the plant structures either confirm FUNCTIONAL fire detection instrumentation in the affected area(s), or establish an hourly fire watch to inspect the affected area(s).

SURVEILLANCE REQUIREMENTS

- A. Each of the above required sprinkler/deluge systems shall be demonstrated FUNCTIONAL:
 - 1) At least once per 92 days by verifying that each manual and automatic valve, excluding check valves, in the flow path is in its correct position.
 - 2) At least once per operating cycle by cycling each valve, excluding check valves, in the flow path through at least one complete cycle of full travel.
 - 3) At least once per operating cycle by performing a system functional test which includes simulated automatic actuation of the system and verifying

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that the automatic valves in the flow path, excluding check valves, actuate to their correct positions.

- 4) At least once per operating cycle by a visual inspection of the pre-action sprinkler and deluge headers to verify their integrity.
- 5) At least once per operating cycle by a visual inspection of each nozzle's spray area to verify the spray pattern is not obstructed.

BASES

See Section 8.2.4 below.

8.2.3 Fire Hose Station/Connections

OPERATING REQUIREMENT

Fire Hose Stations/Connections listed in Table 8-5 shall be FUNCTIONAL.

APPLICABILITY

At all times.

ACTION

With one or more of the above required fire hose stations/connections not functional, within one hour provide an additional fire hose capable of extending to the unprotected area(s) from an FUNCTIONAL hose station/connection.

SURVEILLANCE REQUIREMENTS

- A. Each of the above required fire hose stations/connections shall be demonstrated FUNCTIONAL.
 - 1) At least once per 92 days by a visual inspection of each fire hose station/connection to assure all required equipment is at the location.
 - 2) At least once per 92 days by verifying that each valve, excluding check valves, in the flow path is in its correct position.
 - 3) At least once per 18 months by removing each hose and visually verifying its integrity and re-racking.
 - 4) At least once per 18 months by inspecting all gaskets and replacing any degraded gaskets in the couplings.
 - 5) At least once per three years by partially opening each hose station valve to verify valve FUNCTIONALITY and no flow blockage.
 - 6) At least once per three years by conducting a hose hydrostatic test at a pressure at least 50 psig greater than the maximum pressure available at that hose station.

BASES

See Section 8.2.4 below.

8.2.4 Yard Fire Hydrants and Hose Houses

OPERATING REQUIREMENT

The yard fire hydrants and associated fire hose houses listed in Table 8-6 shall be FUNCTIONAL.

APPLICABILITY

At all times.

ACTION

With one or more of the above required yard fire hydrants and/or associated hydrant hose houses not functional, within one hour provide an additional fire hose capable of extending to the unprotected area(s) from an FUNCTIONAL hose station or fire hydrant.

SURVEILLANCE REQUIREMENTS

Each of the above required yard fire hydrants and associated hydrant hose houses shall be demonstrated FUNCTIONAL.

- A. At least once per 92 days by visual inspection of the hydrant hose house door seal to assure the hose house has not been tampered with.
- B. At least once per six months by visually inspecting each yard fire hydrant and verifying that the hydrant barrel is dry and that the hydrant is not damaged.
- C. At least once per twelve months by:
 - 1) Conducting a hose hydrostatic test at a pressure at least 50 psig greater than the maximum pressure available at that yard fire hydrant.
 - 2) Inspecting all the gaskets and replacing any degraded gaskets in the couplings.
 - 3) Performing a flow check of each hydrant.
 - 4) Visual inspection of the hydrant hose house to assure all required equipment is at the hose house.

BASES

The FUNCTIONALITY of the Appendix A related fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in those portions of the facility containing safety related systems. The fire suppression systems consist of the water system, sprinkler and deluge systems, fire hose stations/connections and

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yard fire hydrants. 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 DBNPS fire protection program.

In the event that portions of the fire suppression systems are not functional, compensatory measures are required until the not functional equipment is restored to service. An hourly fire watch will adequately compensate for loss of a sprinkler/deluge system when the area contains significant quantities of combustible loading (defined as greater than 60,000 BTU/sq. ft.) or potential fuel oil/lube oil hazard areas within the plant structures as identified in Table 8-4. The outside areas and areas within the plant structures that do not contain significant quantities of combustible loading must either have FUNCTIONAL fire detection instrumentation in the affected area or an hourly fire watch to adequately compensate for loss of a sprinkler/deluge system. These systems are not used to protect redundant safe shutdown equipment or components so the potential hazard to public health and safety is reduced.

The sprinkler/deluge system flow path is defined as the path from the fire suppression water system (see Section 8.1.3 Basis) to the last sprinkler/deluge nozzle in the line and does not include vents, drains, inspector test connections or other system branches not leading to sprinklers or deluge nozzles.

All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). A continuous fire watch requires that a fire watch be in the specified area at least once every fifteen minutes with a margin of five minutes (+ five minutes). The use of any part of the fifteen minute or five minute margin does not alter the schedule for any subsequent hourly or continuous (fifteen minute) fire watch, respectively.

8.2.5 Fire Barriers

OPERATING REQUIREMENT

All the fire barriers designated as Appendix A related shall be FUNCTIONAL.

APPLICABILITY

At all times.

ACTION

- A. With one or more of the above fire barriers not functional, within one hour, establish an hourly fire watch on at least one side of the affected fire barrier.

SURVEILLANCE REQUIREMENTS

Each of the above required fire barriers, including sealing devices, shall be verified FUNCTIONAL by:

- A. Performing a visual inspection of the exposed surfaces of each fire-rated wall³, floor and ceiling, electrical raceway fire enclosure and structural steel fire-proofing at least once per 18 months.

3. Barriers that are inaccessible (one side or both sides) due to ALARA considerations are not subject to the requirements for visual inspection.

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- B. Performing a visual inspection of each fire door, fire damper and associated hardware at least once per 18 months.
- C. Performing a visual inspection of at least ten percent⁵ of each type of sealed penetration at least once per 18 months. If the penetration(s) is determined to be not functional, declare the affected penetration(s) not functional and perform a visual inspection of an additional ten percent of the degraded type of seal penetration unless an engineering review determines the failure to be unique to this penetration. If the engineering evaluation does not determine it to be unique the inspection process shall continue until a ten percent sample with no visually apparent adverse changes in appearance or changes from the as-built condition are found or until all required sealed penetrations of the degraded type have been inspected. Samples shall be selected such that each penetration seal will be inspected at least once per 15 years.
- D. Verifying at least once per seven days each fire door⁴ (i) that is unlocked is closed or (ii) that is equipped with an automatic hold-open and release mechanism is free from obstructions.
- E. Verifying at least once per seven days each locked fire doors is closed and locked.
- F. Performing a functional test that verifies the operation of automatic hold-open and release mechanisms upon full openings, and latch and closing mechanisms upon full and partial openings, at least once per 18 months.

BASES

The FUNCTIONALITY of the Appendix A related fire barrier ensures that fires will be confined or adequately retarded from spreading to adjacent fire areas. This design feature minimizes the possibility of a single fire rapidly involving several fire areas of the DBNPS prior to detection and extinguishment. The fire barriers are passive elements in the DBNPS fire protection program.

Fire barriers, including sealing devices, fire doors, electric raceway enclosures, structural steel fireproofing and dampers, are considered FUNCTIONAL when the visually observed condition is the same as the as-designed condition. The as-designed condition of each fire barrier is based on a tested configuration or a configuration analyzed to withstand the fire hazards associated with the fire area. For those fire barriers that are not in the as-designed condition, an evaluation shall be performed to show that the fire rating of the fire barriers is not degraded and that the barrier is FUNCTIONAL or the ACTION statement shall be entered. A one-sided inspection of barriers is permitted when physical constraints or ALARA considerations (defined as the barrier being inside a high radiation area (> 100 mrem/hour exposure to personnel) regardless of plant operational status) render the opposite side inaccessible. For these barriers, the inaccessible side is considered to be unexposed for inspection. Any barrier that requires equipment to be unbolted or dismantled, destruction of a covering surface, or use of cranes or hoists to remove plugs to gain access is also considered to be unexposed.

4. These requirements do not apply to elevator doors.

5. A one-time exception was made for the GFS-1 seal type to not continue doing the 10% samples as required by surveillance requirement C. Reference Safety Evaluation 94-043.

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All hourly fire watches shall be performed at intervals of sixty minutes with a margin of fifteen minutes (+ fifteen minutes). A continuous fire watch requires that a fire watch be in the specified area at least once every fifteen minutes with a margin of five minutes (+ five minutes). The use of any part of the fifteen minute or five minute margin does not alter the schedule for any subsequent hourly or continuous (fifteen minute) fire watch patrol, respectively. Rooms that are continuously staffed or are visible to the continuously staffed area do not require a separate fire watch since the personnel normally in the area serve that function. For fire barriers the only areas this would apply is the Control Room area (Rooms 502, 504, 505, 506, 507, 511 and 512) and the Central Alarm Station area (Room 434).

8.3 Fire Brigade

The onsite fire brigade is composed of a minimum of 5 members. This staffing is maintained onsite at all times. The fire brigade composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence, provided immediate action is taken to fill the required positions. The members of the fire brigade are dedicated personnel that are not relied upon for safe shutdown essential functions in the event of a fire emergency.

The fire brigade members are qualified through a training program that is maintained by the Nuclear Training Department. Qualification requirements include knowledge of plant layout and general operation as well as fire fighting skills and attack strategy.

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TABLE 8-1

Appendix R
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|--|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 051 | Diesel Fire Pump Room 51 | 0 | 0 | 2 | 2 |
| 052 | Service Water Pump Room 52 | 0 | 0 | 7 | 6 |
| 105 | ECCS Pump Room 105 | 0 | 0 | 6 | 5 |
| 110 | Passageway Rooms 110, 110A, Decontamination Area Rm. 112 Condensate Collection Tank and Pump Room 117A | 0 | 0 | 6 | 5 |
| 113 | Decay Heat Cooler Room/Hatch Area-Rooms 113 and 113A | 0 | 0 | 4 | 4 |
| 115 | ECCS Pump Room 115 | 0 | 0 | 3 | 3 |
| 124 | Clean Waste Receiver Tank Room 124 | 0 | 0 | 4 | 4 |
| A208 | Containment Annulus (West) | 0 | 0 | 11 | 10 |
| A236L | Containment Annulus (East) | 0 | 0 | 10 | 9 |
| 211 | Valve Rooms 211 and 212 | 0 | 0 | 4 | 4 |
| 220 | Incore Instrument Trench Area Room 220 | 0 | 0 | 6 | 5 |
| 225 | Makeup Pump Room 225 | 0 | 0 | 3 | 3 |
| 227 | Passage 227 | 0 | 0 | 8 | 7 |
| 235 | Boric Acid Evaporator Room 235 | 0 | 0 | 1 | 1 |
| 241 | Passage 241 | 0 | 0 | 3 | 3 |
| 310 | Passage/Hatch Area Rooms 310 and 313 | 0 | 0 | 12 | 11 |

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-1 (Continued)

Appendix R
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|--|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 314 | No. 4 Mechanical Penetration Room 314 | 0 | 0 | 22 | 20 |
| 314 | Cable Chase Room 314 | 0 | 0 | 1 | 1 |
| 317 | Hatch Area Room 317 | 0 | 0 | 26 | 23 |
| 322 | Passage 322 | 0 | 0 | 4 | 4 |
| 323 | High Volt SWGR Room B | 0 | 0 | 16 | 14 |
| 324 | Auxiliary Shutdown Panel and Transfer Switch Room 324 | 0 | 0 | 5 | 5 |
| 328 | Component Cooling Water Heat Exchanger and Pump Room 328 | 0 | 0 | 12 | 11 |
| 422A | Cable Spreading Room 422A | 0 | 0 | 7 | 6 |
| 427 | No. 2 Electrical Penetration Room 427 | 0 | 0 | 9 | 8 |
| 428 | Low Voltage SWGR Room F-Bus | 0 | 0 | 20 | 18* |
| 429 | Low Voltage SWGR Room E-Bus | 0 | 0 | 9 | 8 |
| 500 | Radwaste and Fuel Handling Areas and Air Supply Equip. Room 501 | 0 | 0 | 26 | 23 |
| 501 | Radwaste Exhaust Equipment and Main Station Exhaust Fan Room 501 | 0 | 0 | 26 | 23 |
| 505 | Control Cabinet Room 502 | 0 | 0 | 5 | 5 |

* - The detector nearest to door 427A is always required to be FUNCTIONAL for barrier FUNCTIONALITY

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-1 (Continued)

Appendix R
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|---|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 505 | Operator Study Room 503 | 0 | 0 | 1 | 1 |
| 505 | Kitchen Room 504 | 1 | 0 | 0 | 1 |
| 505 | Control Room 505 | 0 | 0 | 2 | 2 |
| 505 | Control Room Cabinets | 0 | 0 | 9 | 8 |
| 505 | Control Room Toilet Room 506 | 0 | 0 | 1 | 1 |
| 505 | Shift Supervisor's Office Room 507 | 0 | 0 | 1 | 1 |
| 505 | Computer Room 510 | 0 | 0 | 2 | 2 |
| 505 | Shift Manager's Office Room 511 | 0 | 0 | 1 | 1 |
| 505 | Administrative Assistant's Office Room 512 | 0 | 0 | 1 | 1 |
| 505 | Toilet Room 513 | 0 | 0 | 1 | 1 |
| 515 | Purge Exhaust Equipment Room 515 | 0 | 0 | 26 | 23 |
| 603 | A/C Equipment Room 603 | 0 | 0 | 15 | 14 |

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TABLE 8-2

Appendix R
Automatic Suppression Systems

| SUPPRESSION ZONE | LOCATION |
|---------------------|---|
| FSA-052* | Service Water Pump Room 52 |
| FSA-124* | Clean Waste Receiver Tank Room 124 |
| FSA-208 | No. 1 Mechanical Penetration Pipeway Area – Room 202, 208 |
| FSA-227 | Passageway 227 |
| FWA-235A, 235B | Room 235/Room 124/Room 236 Water Curtain Deluge System |
| FSA-236 | No. 2 Mechanical Penetration Room 236 |
| FSA-303 | No. 3 Mechanical Penetration Room 303 |
| FSA-310 | Passageway 310/Hatch Area 313 |
| FWA-314A, 314B | Room 314/Room 326 Water Curtain Deluge System |
| FSA-314B, * 314C* | No. 4 Mechanical Penetration Room 314 |
| FSA-328* | Component Cooling Water Heat Exch. and Pump Room 328 |
| FSA-402 | No. 1 Electrical Penetration Room 402 |
| FSA-422A1, * 422A2* | Cable Spreading Room 422A |
| FSA-427* | No. 2 Electrical Penetration Room 427 |

* - Requires continuous fire watch when zone is not functional

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-2 (Continued)

Appendix R
Automatic Suppression Systems

| SUPPRESSION ZONE | LOCATION |
|---------------------|--|
| FSA-501A,* 501B* | Room 501 Radwaste Exhaust Equipment and Main Station Exhaust Fan |
| FSA-HB585 | Turbine Bldg. Heater Bay Elev. 585' |
| FSA-TB567 | Turbine Bldg. Elev. 567' |
| FSA-TB585 | Turbine Bldg. Elev. 585' |
| FSA-TB603 | Turbine Bldg. Elev. 603' |
| FSA-HB603 | Turbine Bldg. Heater Bay Elev. 603' |
| FSA-HB623 | Turbine Bldg. Heater Bay Elev. 623' |
| FSA-HB643 | Turbine Bldg. Heater Bay Elev. 643' |
| FSA-HB657 | Turbine Bldg. Heater Bay Elev. 657' |

* - Requires continuous fire watch when zone is not functional..

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TABLE 8-3

Appendix A
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|--|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 053 | Service Water Valve Room 53 | 0 | 0 | 8 | 7 |
| 101 | Equipment and Pipe Chase Room 100, Pipe Tunnel Room 101 | 0 | 0 | 3 | 3 |
| 114 | Miscellaneous Waste Monitor Tank and Pump Room 114 | 0 | 0 | 3 | 3 |
| 118 | Elevator Machine Room 118 | 0 | 0 | 1 | 1 |
| 208 | No. 1 Mechanical Penetration Room 208, Pipeway Area Room 202 | 1 | 0 | 9 | 10 |
| 209 | Corridor 209 | 0 | 0 | 6 | 5 |
| 214 | Core Flood Tank Area Room 214 | 0 | 0 | 4 | 4 |
| 215 | Letdown Cooler Area Room 215 | 0 | 0 | 3 | 3 |
| 221 | Top of Transtube Shield Area Room 221 | 0 | 0 | 4 | 4 |
| 230 | Demineralizer Filter Room 230 | 0 | 0 | 1 | 1 |
| 231 | Clean Waste Booster Pump Room 231 | 0 | 0 | 1 | 1 |
| 232 | Valve Room 232 | 0 | 0 | 2 | 2 |
| 234 | Boric Acid Evaporator Room 234 | 0 | 0 | 1 | 1 |
| 236 | No. 2 Mechanical Penetration Room 236 | 0 | 0 | 6 | 5 |

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-3 (Continued)

Appendix A
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|---|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 237 | Auxiliary Feed Pump Room 237 | 0 | 0 | 4 | 4 |
| 238 | Auxiliary Feed Pump Room 238 | 0 | 0 | 4 | 4 |
| 240 | Boric Acid Addition Tank Room 240 | 0 | 0 | 7 | 6 |
| 242 | Valve Room 242 | 0 | 0 | 2 | 2 |
| 243 | Waste Gas Compressor Room 243 | 0 | 0 | 2 | 2 |
| 244 | Waste Gas Compressor Room 244 | 0 | 0 | 3 | 3 |
| 300 | Fuel Handling Area Room 300 | 0 | 0 | 11** | 10** |
| 300S | Fuel Handling Area Room 300 | 0 | 6 | 0 | 5 |
| 301 | Solid Waste Baler Area Room 301 | 0 | 0 | 2 | 2 |
| 302 | Hot Shop Room 302 | 2 | 0 | 0 | 2 |
| 303 | No. 3 Mechanical Penetration Room303 | 0 | 0 | 15 | 14 |
| 304 | Corridor 304 | 0 | 0 | 6 | 5 |
| 312 | Spent Fuel Pool Pump Room 312 | 0 | 0 | 7 | 6 |
| 318 | Diesel Generator Room 318 | 0 | 0 | 7 | 6* |
| 319 | Diesel Generator Room 319 | 0 | 0 | 5 | 5* |

* - Activates Suppression System

** Four (4) detectors required under Room 300 removable mezzanine extension platform (Ref. DWGs G-AUX-0001, Shts. 1-8) are removed when platform is removed.

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-3 (Continued)

Appendix A
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|---|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 320A | Day Tank Room 320A | 0 | 0 | 1 | 1 |
| 320 | Maintenance Room 320 | 0 | 0 | 2 | 2 |
| 321A | Day Tank Room 321A | 0 | 0 | 1 | 1 |
| 321 | Charge Room 321 | 0 | 0 | 1 | 1 |
| 325 | High Voltage Switchgear A-Bus Room 325 | 0 | 0 | 10 | 9 |
| 400 | Passage 400 | 0 | 0 | 9 | 8 |
| 402 | No. 1 Electrical Penetration Room 402 | 0 | 0 | 15 | 14 |
| 404 | Corridor 404 | 0 | 0 | 7 | 6 |
| 405 | Storage Room 405 | 0 | 0 | 1 | 1 |
| 406 | Hot Instrument Shop Room 406 | 0 | 0 | 2 | 2 |
| 410 | Passage 410 | 0 | 0 | 12 | 11 |
| 412A | Corridor 411 | 0 | 0 | 4 | 4 |
| 412A | Corridor 412 and Corridor 412A | 0 | 0 | 2 | 2 |
| 412A | Trace Analysis Lab 413 | 1 | 0 | 0 | 1 |
| 412A | Respirator Maintenance Room 414 | 0 | 0 | 1 | 1 |
| 412A | Corridor 415 | 0 | 0 | 1 | 1 |
| 412A | Decon Shower 417 | 0 | 0 | 1 | 1 |
| 412A | Decon Shower 417A | 0 | 0 | 1 | 1 |

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-3 (Continued)

Appendix A
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|---|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| 412A | Decon Shower 418 | 0 | 0 | 1 | 1 |
| 412A | I&C Hot Shop 419 | 0 | 0 | 1 | 1 |
| 412A | I&C Hot Shop 420 | 0 | 0 | 1 | 1 |
| 412A | I&C Hot Shop 420A | 0 | 0 | 1 | 1 |
| 412A | Chemistry/RP Storage Area 421 | 0 | 0 | 5 | 5 |
| 412A | Chemistry Oil Testing Lab 423 | 0 | 0 | 1 | 1 |
| 412A | Chem Lab Room 424 | 0 | 0 | 2 | 2 |
| 412A | Chem Lab 424A | 0 | 0 | 1 | 1 |
| 412A | Chem Lab 424B | 0 | 0 | 1 | 1 |
| 412A | Counting Room 424C | 0 | 0 | 1 | 1 |
| 412A | Instrument Calibration Room 425 | 0 | 0 | 1 | 1 |
| 412A | Personnel Lock Area Room 426 | 0 | 0 | 3 | 3 |
| 428A | Battery Room 428A | 0 | 0 | 3 | 3 |
| 429B | Battery Room 429B | 0 | 0 | 2 | 2 |
| 516 | Non-rad Supply Air and Exhaust Equipment Room 516 | 0 | 0 | 9 | 8 |
| H2-SEAL OIL | Seal Oil Unit Room 333 | 1 | 0 | 0 | 1 |

* - Any combination of thermal and smoke detection instruments that equal the minimum required number is acceptable as long as no two adjacent instruments are not functional.

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-3 (Continued)

Appendix A
Fire Detection Systems

| FIRE DETECTOR ZONE (FDZ) | LOCATION | TOTAL NUMBER OF DETECTORS | | | MINIMUM REQUIRED |
|-----------------------------------|----------------------------------|---------------------------|-------|-------|---------------------|
| | | THERMAL | FLAME | SMOKE | |
| WATER TRTMNT BLD | Water Treatment Bldg. | 1 | 0 | 5 | 5 |
| D.O. PMP HSE | Diesel Oil Pumphouse | 1 | 0 | 1 | 2 |
| PSV | Steam Generator Area Room 218 | 2 | 0 | 0 | 1 |
| RCP 1 | Steam Generator Area Room 216 | 2 | 0 | 0 | 1 |
| RCP 2 | Steam Generator Area Room 216 | 2 | 0 | 0 | 1 |
| RCP 3 | Steam Generator Area Room 218 | 2 | 0 | 0 | 1 |
| RCP 4 | Steam Generator Area Room 218 | 2 | 0 | 0 | 1 |

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-4

Appendix A
Automatic Suppression Systems

| SUPPRESSION ZONE | LOCATION |
|--------------------------|------------------------------------|
| FSA-209 | Corridor 209 |
| FSA-304A & 304B | Corridor 304 |
| FSA-318* | Diesel Generator Room 318 |
| FSA-319* | Diesel Generator Room 319 |
| FSA-320* | Day Tank Room 320A |
| FSA-321* | Day Tank Room 321A |
| FSA-405 | Storage Room 405 |
| FSA-MAIN TRANS | Main Transformer |
| FSA-AUX TRANS | Auxiliary Transformer |
| FSA-START-UP TRANS 01 | Startup No. 1 Transformer |
| FSA-START-UP TRANS 02 | Startup No. 2 Transformer |
| FSA-AC TRANS | AC Transformer |
| FSA-BD TRANS | BD Transformer |
| FSA-L.O. STR RM* | Lube Oil Storage Tanks Room, 249 |
| FSA-H2-SEAL OIL* | Seal Oil Room 333 |
| FSA-AUX BOILER* | Auxiliary Steam Boiler Room 331 |
| FSA-OIL DRUM STORAGE* | Oil Drum Storage Room 337 |

* - Contain significant quantities of combustible loading within the plant structures

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-5

Appendix A
Hose Stations/Connections

| HOSE STATION | LOCATION |
|--------------|--|
| C-12 | Auxiliary Bldg. 545' AB-2 Stairwell |
| C-13 | Auxiliary Bldg. 565' AB-2 Stairwell |
| C-14 | Auxiliary Bldg. 585' AB-2 Stairwell |
| C-15 | Auxiliary Bldg. 603' AB-2 Stairwell |
| C-18 | Non-RCA 638' AB-1 Stairwell |
| C-19 | Non-RCA 585' AB-1 Stairwell |
| C-21 | Auxiliary Bldg. 565' AB-3A Stairwell |
| C-22 | Auxiliary Bldg. 585' AB-3A Stairwell |
| C-23 | Auxiliary Bldg. 603' AB-3A Stairwell |
| C-24 | Auxiliary Bldg. 623' AB-3A Stairwell |
| C-28 | Maintenance Shop 585' |
| HR-01 | Turbine Bldg. 565' MFPT 1-1 |
| HR-02 | Turbine Bldg. 585' Next to Lobby Door |
| HR-03 | Turbine Bldg. Maintenance Workshop 585' |
| HR-04 | Turbine Building 585' |
| HR-05 | Heater Bay Area 585' |
| HR-06 | Turbine Bldg. 585' So. of Aux. Blr. |
| HR-07 | Turbine Bldg. 585' West Circ. Pmp. Hse. |
| HR-08 | Turbine Bldg. 603' Next to old RCA Entr. |
| HR-09 | Turbine Bldg. 603' Next to Lube Oil Rm. |
| HR-10 | Turbine Bldg. 603' East Side |
| HR-11 | Heater Bay Area 603' |

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TABLE 8-5 (Continued)

Appendix A
Hose Stations/Connections

| HOSE STATION | LOCATION |
|--------------|--|
| HR-12 | Turbine Bldg. Outside CR Foyer |
| HR-13 | Turbine Bldg. 623' Behind EF 6 |
| HR-14 | Turbine Bldg. 623' Next to Cnd. Tk. Rm. |
| HR-15 | Turbine Bldg. 623' Next to Fire Brigade Room |
| HR-16 | Turbine Bldg. 565' MFPT 1-2 |
| HR-17 | Turbine Bldg. 565' Condenser Pit |
| HR-18 | Diesel Oil Storage Tank |
| HR-50 | Turbine Bldg. 603' N. Heater Bay |
| HR-51 | Turbine Bldg. 585' N. Heater Bay |
| HR-52 | Intake Structure Room 50 |
| HCS-19 | Water Treatment Bldg. 565' |
| HCS-20 | Water Treatment Bldg. 585' |
| HCS-21 | Boric Acid Evaporator Passageway |
| HCS-22 | Corridor 209 (West) |
| HCS-23 | Passageway to Diesel Generator Rooms |
| HCS-24 | Passageway 310 |
| HCS-25 | Fuel Handling Area |
| HCS-26 | Auxiliary Bldg. 603' Corridor 404 |
| HCR-27 | Corridor 411 |
| HCS-28 | No. 2 Electrical Penetration Room |
| HCS-29 | Auxiliary Bldg. 545' Corridor 110 |
| HCS-30 | Purge Exhaust Equipment Room |

Davis-Besse Unit 1 Fire Hazard Analysis Report

TABLE 8-5 (Continued)

Appendix A
Hose Stations/Connections

| HOSE STATION | LOCATION |
|--------------|--|
| HCS-31 | A/C Equipment Room |
| HCS-32 | Corridor, Central Area of Aux. Bldg. |
| HCS-33 | Walkway to ECCS Pump Room No. 1 |
| HCS-34 | Boric Acid Addition Tk. Rm. Passageway |
| HCS-35 | Corridor 209 (East) |
| HCS-36 | No. 4 Mechanical Penetration Room |
| HCS-37 | Auxiliary Bldg. 585' Corridor 304 |
| HCS-38 | No. 3 Mechanical Penetration Room |
| HCS-39 | No. 1 Electrical Penetration Room |
| HCR-40 | Auxiliary Bldg. 603' RCA Entrance |
| HCS-41 | Main Steamline Room No. 1 |
| HCS-42 | Radwaste & Fuel Handling Area |
| HCS-43 | A/C Equipment Room |
| HCS-44 | Main Station Exhaust Fan Room |
| HCS-45 | Diesel Generator Room 1-2 |
| HCS-46 | Diesel Generator Room 1-1 |
| HCS-47 | Auxiliary Bldg. 565' No. 1 Mechanical Penetration Room |
| HCS-48 | Auxiliary Bldg. 565' No. 2 Mechanical Penetration Room |
| HCS-49 | Auxiliary Bldg. 643' No. 1 Main Steam Line |
| HRK-16 | A.B. AB-1 Stairway |
| HRK-17 | A.B. AB-1 Stairway |
| HRK-20 | A.B. AB-1 Stairway |

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TABLE 8-6

Appendix A
Hydrants and Hydrant Hose Houses

| HYDRANT/ HOSE HOUSE NUMBER | LOCATION |
|-------------------------------|---|
| HH-1 | Northwest of Water Treatment Building |
| HH-2 | East of Office Building |
| HH-13 | West of Number 2 Startup Transformer |
| HH-15 | North of Number 2 Startup Transformer |
| HH-16 | North of Turbine Train Bay |
| H-1 | Northwest of Water Treatment Building (Provides coverage for Water Treatment Building, Intake Structure, Pump House, Turbine Building, Transformer, etc.) |
| H-2 | East of Office Building (Provides coverage for Water Treatment Building, Intake Structure, Pump House, Turbine Building, etc.) |
| H-3 | Southeast Corner of Maintenance Shop (Provides coverage for Water Treatment Building, Intake Structure, Pump House, Turbine Building, etc.) |
| H-13 | West of Number 2 Startup Transformer (Provides coverage for Auxiliary Building, Transformers, etc.) |
| H-15 | North of Number 2 Startup Transformer (Provides coverage for Auxiliary Building, Transformers, Diesel Fuel Oil Week Tanks, etc.) |
| H-16 | North of Turbine Train Bay (Provides coverage for Pump House, Turbine Building, Transformers, etc.) |