ENCLOSURE 5

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENTS
SERVICE WATER SYSTEM

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PLANT SYSTEMS

SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 The service water system shall be OPERABLE with at least:

In OPERATIONAL CONDITIONS 1, 2, and 3:

Three ~~Two~~ OPERABLE site nuclear service water pumps, and two OPERABLE conventional service water pumps capable of supplying the nuclear and conventional headers.

In OPERATIONAL CONDITIONS 4 and 5:

Three OPERABLE ite nuclear service water pumps, and two operable Unit 1 service water pumps, nuclear and/or conventional, powered from separate emergency buses and capable of supplying the nuclear header.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5

ACTION:

a. In OPERATIONAL CONDITION 1, 2, or 3: INSERT A

1. With two OPERABLE conventional service water pumps and only one nuclear service water pump OPERABLE, restore the remaining nuclear service water pump to OPERABLE status within 7 days or be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

2. With no OPERABLE nuclear service water pumps, regardless of conventional service water pump status, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With two OPERABLE nuclear service water pumps and only one conventional service water pump OPERABLE, restore at least one additional conventional service water pump to OPERABLE status within 7 days or be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

4. With two OPERABLE nuclear service water pumps and no conventional service water pump OPERABLE, restore at least one conventional service water pump to OPERABLE status within 72 hours and restore the remaining conventional service water pump to OPERABLE status within 7 days from the time of the loss of the first pump. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

5. With only one nuclear service water pump and one conventional service water pump OPERABLE, restore at least one additional service water pump, nuclear or conventional, to OPERABLE status within 72 hours and restore the remaining service water pump to OPERABLE status within 7 days from the time of the loss of the first pump. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

6. With one OPERABLE nuclear service water pump and no OPERABLE conventional service water pumps, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. In OPERATIONAL CONDITION 4 or 5:

1. With one less than the required number of nuclear service water pumps OPERABLE per site, restore at least one additional nuclear service water pump to OPERABLE status within 14 days or declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

2. With the service water system nuclear header inoperable, or no Unit 1 nuclear service water pumps OPERABLE, operation may continue provided that the service water system conventional header is OPERABLE with at least two conventional service water pumps OPERABLE. Restore the service water system nuclear header to OPERABLE status within 14 days or declare the Core Spray System and the LPCI System inoperable and take the ACTION required by Specifications 3.5.3.1 and 3.5.3.2. Also, declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

3. With less than two OPERABLE site nuclear service water pumps, declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

4. With only one Unit 1 service water pump OPERABLE, restore at least one additional Unit 1 pump, either nuclear or conventional, powered from a separate emergency bus, to OPERABLE status within 7 days or declare the Core Spray System and the LPCI System inoperable and take the ACTION required by Specifications 3.5.3.1 and 3.5.3.2.

INSERT A

1. With one OPERABLE conventional service water pump, restore at least one additional conventional service water pump to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and COLD shutdown within the following 24 hours.

2. With no conventional service water pumps OPERABLE, restore at least one conventional service water pump to OPERABLE status within 12 hours, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With two OPERABLE site nuclear service water pumps, unless the provisions of ACTION b.4 apply for Unit 2, restore one additional site nuclear service water pump within 7 days or be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

4. With two OPERABLE site nuclear service water pumps and less than two OPERABLE conventional service water pumps, restore at least two conventional service water pumps to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

5. With less than two OPERABLE site nuclear service water pumps, be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

b. In OPERATIONAL CONDITIONS 4 or 5:

1. With one OPERABLE Unit 1 service water pump, restore at least two Unit 1 service water pumps to OPERABLE status within 7 days or declare the Core Spray and LPCI systems inoperable.

2. With no OPERABLE Unit 1 service water pumps, declare the Core Spray and LPCI systems inoperable.

3. With two OPERABLE site nuclear service water pumps, unless the provisions of ACTION b.4 apply, restore at least one additional nuclear service water pump to OPERABLE status within 7 days or declare the diesel generators inoperable.

4. With the service water system nuclear header inoperable, operation of both units may continue provided that two Unit 2 nuclear service water pumps are OPERABLE, both units' nuclear service water header valves are administratively controlled as required to ensure cooling water to the diesel generators, at least two Unit 1 conventional service water pumps are OPERABLE on the conventional header, and vital ECCS loads are aligned to the conventional service water system header. Restore the service water

system nuclear header and at least three site nuclear service water pumps to OPERABLE status within 14 days. Otherwise, declare the core spray system, the LPCI system, and the diesel generators inoperable.

5. With less than two OPERABLE site nuclear service water pumps, declare the diesel generators inoperable.

SURVEILLANCE REQUIREMENTS

4.7.1.2 The service water system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on the appropriate ECCS actuation test signals.

c. ~~In OPERATIONAL CONDITION 4 or 5 with service water system nuclear header inoperable, verify that the service water system conventional header is lined up to supply cooling water to vital ECCS loads and that the Unit 2 nuclear header is lined up to supply cooling water for the diesel generators by verifying that each valve servicing the diesel generators that is not locked open is administratively controlled in the proper position.~~

Deleted. (See ACTION b.4).

3/4 10.5 PLANT SERVICE WATER

LIMITING CONDITION FOR OPERATION

3.10.5 The service water conventional 4 header required to be operating per Specification 3.7.1.2 ACTION b.3 may be removed from operation by stopping the pumps to permit isolating and draining the service water nuclear header for maintenance provided that:

a. The service water conventional header remains lined up to supply cooling water to the required ECCS loads.

b. The draining/maintenance on the service water nuclear header will not affect the service water conventional system or lineup described in a. above.

c. Average coolant temperature is $\leq 100^{\circ}F$ and the heatup rate is $\leq 10^{\circ}F$ per hour.

d. Two dedicated qualified members of the unit operational staff are assigned to initiate the service water conventional header pumps, should any of the following occur:

1. Any event occurs which requires ECCS actuation.

2. Primary coolant temperature exceeds $180^{\circ}F$.

3. A loss of offsite power occurs.

APPLICABILITY: OPERATIONAL CONDITIONS 4 and 5 with the nuclear header inoperable.

ACTION: With the requirements of the above specification not satisfied, as soon as practicable, restore the:

a. Service water conventional header to operating 4 status per the requirements of Specification 3.7.1.2 ACTION b.3, or

b. Service water nuclear header to OPERABLE status per Specification 3.7.1.2.

SURVEILLANCE REQUIREMENTS

4.10.5 When the service water conventional header is not operating as specified above:

a. Prior to securing all service water pumps, verify that the service water conventional header is lined up to supply cooling water for ECCS by verifying that each valve servicing safety-related equipment that is not locked in the proper position is administratively controlled in the proper position.

RETYPED TECH. SPECS.
Updated Thru. Amend. 53

3/4.7.1 SERVICE WATER SYSTEMS

During the initial stage of a DBA (0-10 minutes), the service water system provides lube water and service water cooling to the diesel generators. The service water system design allows either unit's nuclear header to supply diesel generator cooling water. Two pumps are necessary to supply sufficient flow to cool all four diesel generators under worst-case scenarios while also supplying flow to other safety and non-safety related components. Therefore, any combination of three OPERABLE nuclear service water pumps per site will meet the single failure criteria and assure diesel generator cooling. The requirement for two OPERABLE nuclear service water pumps associated with a unit in OPERATIONAL CONDITIONS 1, 2, or 3 and at least three OPERABLE nuclear service water pumps per site when one or both units are in OPERATIONAL CONDITIONS 4 or 5 ensures that emergency diesel generator cooling requirements are met.

After the initial ten minutes of a DBA, additional loads require cooling water. These loads include RHR and CS pump room coolers, RHR service water heat exchangers, and RHR pump seal heat exchangers. Evaluations have determined that the RHR pump seals, as well as the equipment in rooms serviced by the RHR and CS room coolers, remain within the manufacturers' temperature limits for the first ten minutes of a DBA. To meet the additional loads during the post-ten minute stage of a DBA, two service water pumps on the affected unit must be in service. In order to assure single failure criteria is met, the Technical Specification requires two OPERABLE conventional service water pumps per unit while in OPERATIONAL CONDITION 1, 2, or 3.

As discussed above, when in OPERATIONAL CONDITIONS 4 and 5, the reduced core decay heat load and the accessibility to the reactor building for manual operator action reduce the requirement for OPERABLE service water pumps after an accident/transient to one. Therefore, when in OPERATIONAL CONDITIONS 4 or 5, two OPERABLE service water pumps (any combination of nuclear and/or conventional) capable of supplying the nuclear header are required provided that there are at least three OPERABLE nuclear service water pumps per site. Maintaining two OPERABLE service water pumps (nuclear and/or conventional) on the unit while in OPERATIONAL CONDITIONS 4 or 5 assures long-term cooling can be supplied, even after application of the single failure criteria. Stipulating at least three OPERABLE nuclear service water pumps per site assures diesel generator cooling will be available following any DBA, regardless of which unit suffers the accident/transient.

The allowed out-of-service times and compensatory measures established in the ACTION Statements are conservative. In particular, ACTION Statement a.2 for OPERATIONAL CONDITIONS 1, 2, and 3 requires the unit to be in HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours with no OPERABLE nuclear service water pumps. Analyses have been performed which

3/4.7.1 SERVICE WATER SYSTEMS

The service water system is designed to provide cooling water for the removal of heat from equipment such as the emergency diesel generators, Residual Heat Removal (RHR) pump coolers, and room coolers for Emergency Core Cooling System (ECCS) equipment, that is required for a safe reactor shutdown following a design basis accident (DBA) or transient. The service water system also provides cooling to the Reactor Building Closed Cooling Water (RBCCW) System and the Residual Heat Removal Service Water (RHRSW) System, as required, during normal and shutdown operation. The service water system provides lubricating water for the service water pumps and cooling water for the service water pump motors. During the initial stage (0 - 10 minutes) of a LOCA or LOOP, the service water system must automatically provide cooling water to the emergency diesel generators. Following the first ten minute period, additional safety-related and shutdown cooling loads must be supplied. The service water system also provides flow to the Turbine Building Closed Cooling Water System, the Chlorination System, and fill to the Circulating Water System.

The service water system design allows either (or both) unit's nuclear header to supply diesel generator cooling water when required. The phrase "site nuclear service water pump" refers to any nuclear service water pump on either unit. Other pump designations refer to the specific unit under discussion. The four nuclear service water pumps on site, two per unit, are each on a separate emergency bus so that a single failure could prevent only one nuclear service water pump from operating.

The OPERABILITY requirements are structured to ensure that the Service Water System is capable of automatically supplying sufficient cooling water for the Diesel Generators assuming no operator action for the first 10 minutes following a DBA, and that at least one service water pump per unit is available to supply the safety-related and shutdown cooling loads after the first ten minutes following a DBA. The OPERABILITY requirements for the service water system are, in general, based on a LOCA (Loss of Coolant Accident), and in some cases combined with a LOOP (Loss of Offsite Power), since this event or combination would provide the most significant challenge to the system's capabilities.

The four nuclear service water pumps are powered from separate emergency buses. The three conventional service water pumps on each unit are on separate emergency buses. For each unit, two of the conventional pumps are on the same emergency buses as the two unit nuclear service water pumps. The loss of one nuclear pump and one conventional pump on the unit due to a single failure of one emergency bus has been accounted for in the OPERABILITY requirements. However, conventional service water pump OPERABILITY will be more strictly defined in cases where only one nuclear pump and one conventional pump are available for operation. Therefore, with one unit nuclear service water pump and one conventional service water pump available, the conventional service water pump must be powered from a separate emergency bus to be considered OPERABLE.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

In OPERATIONAL CONDITIONS 1, 2, and 3, a conventional service water pump must be capable of supplying water to both the nuclear header and the conventional header to be considered OPERABLE. This will ensure that the vital header and RHR service water heat exchangers can be supplied from either header when a single failure of any header isolation valve is assumed and personnel access is not available for manual valve alignment. In OPERATIONAL CONDITIONS 4 and 5, because of reduced primary pressure, the possibility of a LOCA is not considered credible and access is considered available to manually position header isolation valves if required. Therefore, in OPERATIONAL CONDITIONS 4 and 5, a conventional pump may be considered OPERABLE when only the nuclear header discharge valve is OPERABLE except as specifically identified in the ACTION statement for a nuclear header outage. This allows maintenance on the conventional header without reducing service water system OPERABILITY. However, a conventional pump aligned to the nuclear header is not considered to meet the requirements for an OPERABLE nuclear pump since it is not automatically powered and restarted on the diesel generators following an accident signal.

For OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5, and a DBA in either unit, two nuclear service water pumps from one or both units are capable of supplying sufficient flow to cool all four emergency diesel generators under worst-case scenarios while also supplying flow to other potential flow paths (vital header loads, cross-header leakage, and lubewater). To prohibit any single failure from preventing the supply of service water to the diesel generators during the first 10 minutes following a DBA, at least three nuclear service water pumps per site are required while in OPERATIONAL CONDITIONS 1, 2, 3, 4, or 5.

After the first ten minutes following a DBA, additional loads may require cooling water on the affected unit. These loads include RHR and CS pump room coolers, RHR service water heat exchangers, and RHR pump seal heat exchangers. Evaluations have determined that the RHR pump seals, as well as the equipment in rooms serviced by the RHR and CS room coolers, remain within the manufacturers' temperature limits for at least the first ten minutes of a DBA. Operator action is credited after the first 10 minutes following a DBA to make the necessary pump and valve alignments either remotely or manually, except that manual action inside the Reactor Building following a LOCA while in OPERATIONAL CONDITIONS 1, 2, and 3 is not credited because of the potential for unsafe conditions.

In OPERATIONAL CONDITIONS 1, 2, and 3, one conventional service water pump supporting the affected unit is capable of supplying the additional required safety-related and shutdown equipment. No single failure can prevent the necessary loads from being aligned to one of the nuclear or conventional headers by manual or remote operator action. To prohibit any single failure from preventing the supply of service water after the first 10 minutes following a DBA, at least two operable conventional service water pumps are required while in OPERATIONAL CONDITIONS 1, 2, or 3.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

In OPERATIONAL CONDITIONS 4 and 5, one unit service water pump, nuclear or conventional, is capable of supplying the additional required safety-related and shutdown equipment. Manual action in the Reactor Building is credited to align equipment to the nuclear header if required. To prohibit any single failure from preventing the supply of service water after the first 10 minutes following a DBA, at least two OPERABLE unit service water pumps, nuclear or conventional, are required while in OPERATIONAL CONDITIONS 4 and 5.

The allowed out-of-service times and compensatory measures established in the ACTION statements are conservative. Although the probability and consequences of a DBA are reduced in OPERATIONAL CONDITIONS 4 and 5, the ACTION statements for the nuclear service water pumps for a unit in OPERATIONAL CONDITIONS 4 or 5 are based on the assumption that the other unit is in OPERATIONAL CONDITIONS 1, 2, or 3. Specific ACTION statements and LCO time limits have not been established for both units in OPERATIONAL CONDITIONS 4 or 5 since the ACTION statements for one unit in OPERATIONAL CONDITIONS 4 or 5 are more conservative.

In OPERATIONAL CONDITIONS 4 and 5, because of reduced core decay heat load, the reduced possibility of a LOCA, and the accessibility to the reactor building for manual operator action, the vital header loads could be manually aligned to the nuclear header if a failure prevented remote valve alignment. Therefore, the operability requirements for the unit service water pumps apply for nuclear or conventional pumps. With one OPERABLE unit service water pump, the core spray and LPCI systems remain OPERABLE. However, to minimize the possibility of loss of these systems due to loss of the single pump, the out-of-service time for one OPERABLE unit service water pump is set at 7 days. For no OPERABLE unit service water pumps, the core spray and LPCI systems must be declared inoperable. This is equivalent to the ACTION statement for core spray and LPCI systems inoperable.

ACTION statement 3.7.1.2.b.4 for OPERATIONAL CONDITIONS 4 and 5 allows one unit to operate with the nuclear service water header inoperable for up to 14 days provided that:

a) two nuclear service water pumps are OPERABLE on the other unit,
b) both unit's nuclear service water header valves are administratively controlled as required to ensure cooling water to the diesel generators,
c) the service water system conventional header is OPERABLE with two unit conventional service water pumps OPERABLE, and
d) vital ECCS loads are aligned to the conventional service water system header.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

Considering any additional single failure, this requirement ensures at least one OPERABLE nuclear service water pump to supply the Diesel Generators during the first 10 minutes after a DBA and one OPERABLE conventional service water pump to supply the unit safety-related and shutdown cooling loads following the first 10 minutes after a DBA. By requiring administrative control of both unit's nuclear header valves, the ACTION statement minimizes the risk of inadvertent valve action that could reduce cooling water flow to the diesel generators.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

demonstrate operation to OPERATIONAL CONDITIONS 1 through 3 with no OPERABLE nuclear service water pumps is acceptable provided that at least two nuclear service water pumps are OPERABLE on the opposite unit and two conventional pumps are OPERABLE on the affected unit. Specific ACTION statements and LCO time limits for this situation have not been developed since a more conservative ACTION Statement has been established in order to minimize the risk of personnel error in administrating this situation.

3/4.7.2 CONTROL ROOM EMERGENCY FILTRATION SYSTEM

The OPERABILITY of the control room ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less, whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 10 of Appendix "A", 10 CFR Part 50.

3/4.7.3 FLOOD PROTECTION

The limitation on flood protection ensures that facility protective actions will be taken and operation will be terminated in the event of flood conditions. The limit of elevation 17'6" Mean Sea Level is based on the maximum elevation at which facility flood control measures provide protection to safety-related equipment.

3/4.7.4 REACTOR CORE ISOLATION COOLING SYSTEM

The reactor core isolation cooling system (RCICS) is provided to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without requiring actuation of any of the Emergency Core Cooling equipment. RCICS is conservatively required to be OPERABLE whenever reactor pressure exceeds 113 psig even though the Residual Heat Removal (RHR) system provides adequate core cooling up to 150 psig. The condensate storage tank provides sufficient water to reduce the reactor coolant temperature and pressure to permit the RHR system to be operated.

ENCLOSURE 6

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENTS
SERVICE WATER SYSTEM

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PLANT SYSTEMS

SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 The service water system shall be OPERABLE with at least:

In OPERATIONAL CONDITIONS 1, 2, and 3:

Three ~~Two~~ site OPERABLE nuclear service water pumps, and two OPERABLE conventional service water pumps capable of supplying the nuclear and conventional headers.

In OPERATIONAL CONDITIONS 4 and 5:

Three OPERABLE site nuclear service water pumps; and two OPERABLE Unit 2 service water pumps, nuclear and/or conventional, powered from separate emergency buses and capable of supplying the nuclear header.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5

ACTION:

a. In OPERATIONAL CONDITION 1, 2, or 3: INSERT B

1. With two OPERABLE conventional service water pumps and only one nuclear service water pump OPERABLE, restore the remaining nuclear service water pump to OPERABLE status within 7 days or be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

2. With no OPERABLE nuclear service water pumps, regardless of conventional service water pump status, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With two OPERABLE nuclear service water pumps and only one conventional service water pump OPERABLE, restore at least one additional conventional service water pump to OPERABLE status within 7 days or be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

4. With two OPERABLE nuclear service water pumps and no conventional service water pump OPERABLE, restore at least one conventional service water pump to OPERABLE status within 72 hours and restore the remaining conventional service water pump to OPERABLE status within 7 days from the time of the loss of the first pump. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

5. With only one nuclear service water pump and one conventional service water pump OPERABLE, restore at least one additional service water pump, nuclear or conventional, to OPERABLE status within 72 hours and restore the remaining service water pump to OPERABLE status within 7 days from the time of the loss of the first pump. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

6. With one OPERABLE nuclear service water pump and no OPERABLE conventional service water pumps, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. In OPERATIONAL CONDITION 4 or 5:

1. With one less than the required number of nuclear service water pumps OPERABLE per site, restore at least one additional nuclear service water pump to OPERABLE status within 14 days or declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

2. With the service water system nuclear header inoperable, or no Unit 2 nuclear service water pumps OPERABLE, operation may continue provided that the service water system conventional header is OPERABLE with at least two conventional service water pumps OPERABLE. Restore the service water system nuclear header to OPERABLE status within 14 days or declare the Core Spray System and the LPCI System inoperable and take the ACTION required by Specifications 3.5.3.1 and 3.5.3.2. Also, declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

3. With less than two OPERABLE site nuclear service water pumps, declare the diesel generators inoperable and take the ACTION required by Specification 3.8.1.2.

4. With only one Unit 2 service water pump OPERABLE, restore at least one additional Unit 2 pump, either nuclear or conventional, powered from a separate emergency bus, to OPERABLE status within 7 days or declare the Core Spray System and the LPCI System inoperable and take the ACTION required by Specifications 3.5.3.1 and 3.5.3.2.

INSERT B

1. With one OPERABLE conventional service water pump, restore at least one additional conventional service water pump to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and COLD shutdown within the following 24 hours.

2. With no conventional service water pumps OPERABLE, restore at least one conventional service water pump to OPERABLE status within 12 hours, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With two OPERABLE site nuclear service water pumps, unless the provisions of ACTION b.4 apply for Unit 1, restore one additional site nuclear service water pump within 7 days or be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

4. With two OPERABLE site nuclear service water pumps and less than two OPERABLE conventional service water pumps, restore at least two conventional service water pumps to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

5. With less than two OPERABLE site nuclear service water pumps, be in at least HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

b. In OPERATIONAL CONDITIONS 4 or 5:

1. With one OPERABLE Unit 2 service water pump, restore at least two Unit 2 service water pumps to OPERABLE status within 7 days or declare the Core Spray and LPCI systems inoperable.

2. With no OPERABLE Unit 2 service water pumps, declare the Core Spray and LPCI systems inoperable.

3. With two OPERABLE site nuclear service water pumps, unless the provisions of ACTION b.4 apply, restore at least one additional nuclear service water pump to OPERABLE status within 7 days or declare the diesel generators inoperable.

4. With the service water system nuclear header inoperable, operation of both units may continue provided that two Unit 1 nuclear service water pumps are OPERABLE, both units' nuclear service water header valves are administratively controlled as required to ensure cooling water to the diesel generators, at least two Unit 2 conventional service water pumps are OPERABLE on the conventional header, and vital ECCS loads

are aligned to the conventional service water system header. Restore the service water system nuclear header and at least three site nuclear service water pumps to OPERABLE status within 14 days. Otherwise, declare the core spray system, the LPCI system, and the diesel generators inoperable.

5. With less than two OPERABLE site nuclear service water pumps, declare the diesel generators inoperable.

SURVEILLANCE REQUIREMENTS

4.7.1.2 The service water system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on the appropriate ECCS actuation test signals.

c. In OPERATIONAL CONDITION 4 or 5 with service water system nuclear header inoperable, verify that the service water system conventional header is lined up to supply cooling water to vital ECCS loads and that the Unit 1 nuclear header is lined up to supply cooling water for the diesel generators by verifying that each valve servicing the diesel generators that is not locked open is administratively controlled in the proper position.

Deleted. (See ACTION b. 4).

3/4 10.5 PLANT SERVICE WATER

LIMITING CONDITION FOR OPERATION

3.10.5 The service water conventional header required to be operating per Specification 3.7.1.2 ACTION b.4 may be removed from operation by stopping the pumps to permit isolating and draining the service water nuclear header for maintenance provided that:

a. The service water conventional header remains lined up to supply cooling water to the required ECCS loads.

b. The draining/maintenance on the service water nuclear header will not affect the service water conventional system or lineup described in [illegible]

c. Average coolant temperature is ≤100°F and the heatup rate is ≤10°F per hour.

d. Two dedicated, qualified members of the unit operational staff are assigned to initiate the service water conventional header pumps should any of the following occur:

1. Any event occurs which requires ECCS actuation.

2. Primary coolant temperature exceeds 180°F.

3. A loss of offsite power occurs.

APPLICABILITY: OPERATIONAL CONDITIONS 4 and 5 with the nuclear header inoperable.

ACTION: With the requirements of the above specification not satisfied, as soon as practicable, restore the:

a. Service water conventional header to operating status per the requirements of Specification 3.7.1.2 ACTION b.4, or

b. Service water nuclear header to OPERABLE status per Specification 3.7.1.2.

SURVEILLANCE REQUIREMENTS

4.10.5 When the service water conventional header is not operating as specified above:

a. Prior to securing all service water pumps, verify that the service water conventional header is lined up to supply cooling water for ECCS by verifying that each valve servicing safety-related equipment that is not locked in the proper position is administratively controlled in the proper position.

RETYPED TECH. SPECS.
Updated Thru. Amend. 78

3/4.7.1 SERVICE WATER SYSTEMS

During the initial stage of a DBA (0-10 minutes), the service water system provides lube water and service water cooling to the diesel generators. The service water system design allows either unit's nuclear header to supply diesel generator cooling water. Two pumps are necessary to supply sufficient flow to cool all four diesel generators under worst-case scenarios while also supplying flow to other safety and non-safety related components. Therefore, any combination of three OPERABLE nuclear service water pumps per site will meet the single failure criteria and assure diesel generator cooling. The requirement for two OPERABLE nuclear service water pumps associated with a unit in OPERATIONAL CONDITIONS 1, 2, or 3 and at least three OPERABLE nuclear service water pumps per site when one or both units are in OPERATIONAL CONDITIONS 4 or 5 ensures that emergency diesel generator cooling requirements are met.

After the initial ten minutes of a DBA, additional loads require cooling water. These loads include RHR and CS pump room coolers, RHR service water heat exchangers, and RHR pump seal heat exchangers. Evaluations have determined that the RHR pump seals, as well as the equipment in rooms serviced by the RHR and CS room coolers, remain within the manufacturers' temperature limits for the first ten minutes of a DBA. To meet the additional loads during the post-ten minute stage of a DBA, two service water pumps on the affected unit must be in service. In order to assure single failure criteria is met, the Technical Specification requires two OPERABLE conventional service water pumps per unit while in OPERATIONAL CONDITION 1, 2, or 3.

As discussed above, when in OPERATIONAL CONDITIONS 4 and 5, the reduced core decay heat load and the accessibility to the reactor building for manual operator action reduce the requirement for OPERABLE service water pumps after an accident/transient to one. Therefore, when in OPERATIONAL CONDITIONS 4 or 5, two OPERABLE service water pumps (any combination of nuclear and/or conventional) capable of supplying the nuclear header are required provided that there are at least three OPERABLE nuclear service water pumps per site. Maintaining two OPERABLE service water pumps (nuclear and/or conventional) on the unit while in OPERATIONAL CONDITIONS 4 or 5 assures long-term cooling can be supplied, even after application of the single failure criteria. Stipulating at least three OPERABLE nuclear service water pumps per site assures diesel generator cooling will be available following any DBA, regardless of which unit suffers the accident/transient.

The allowed out-of-service times and compensatory measures established in the ACTION Statements are conservative. In particular, ACTION Statement a.2 for OPERATIONAL CONDITIONS 1, 2, and 3 requires the unit to be in HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the following 24 hours with no OPERABLE nuclear service water pumps. Analyses have been performed which

3/4.7.1 SERVICE WATER SYSTEMS

The service water system is designed to provide cooling water for the removal of heat from equipment such as the emergency diesel generators, Residual Heat Removal (RHR) pump coolers, and room coolers for Emergency Core Cooling System (ECCS) equipment, that is required for a safe reactor shutdown following a design basis accident (DBA) or transient. The service water system also provides cooling to the Reactor Building Closed Cooling Water (RBCCW) System and the Residual Heat Removal Service Water (RHRSW) System, as required, during normal and shutdown operation. The service water system provides lubricating water for the service water pumps and cooling water for the service water pump motors. During the initial stage (0 - 10 minutes) of a LOCA or LOOP, the service water system must automatically provide cooling water to the emergency diesel generators. Following the first ten minute period, additional safety-related and shutdown cooling loads must be supplied. The service water system also provides flow to the Turbine Building Closed Cooling Water System, the Chlorination System, and fill to the Circulating Water System.

The service water system design allows either (or both) unit's nuclear header to supply diesel generator cooling water when required. The phrase "site nuclear service water pump" refers to any nuclear service water pump on either unit. Other pump designations refer to the specific unit under discussion. The four nuclear service water pumps on site, two per unit, are each on a separate emergency bus so that a single failure could prevent only one nuclear service water pump from operating.

The OPERABILITY requirements are structured to ensure that the Service Water System is capable of automatically supplying sufficient cooling water for the Diesel Generators assuming no operator action for the first 10 minutes following a DBA, and that at least one service water pump per unit is available to supply the safety-related and shutdown cooling loads after the first ten minutes following a DBA. The OPERABILITY requirements for the service water system are, in general, based on a LOCA (Loss of Coolant Accident), and in some cases combined with a LOOP (Loss of Offsite Power), since this event or combination would provide the most significant challenge to the system's capabilities.

The four nuclear service water pumps are powered from separate emergency buses. The three conventional service water pumps on each unit are on separate emergency buses. For each unit, two of the conventional pumps are on the same emergency buses as the two unit nuclear service water pumps. The loss of one nuclear pump and one conventional pump on the unit due to a single failure of one emergency bus has been accounted for in the OPERABILITY requirements. However, conventional service water pump OPERABILITY will be more strictly defined in cases where only one nuclear pump and one conventional pump are available for operation. Therefore, with one unit nuclear service water pump and one conventional service water pump available, the conventional service water pump must be powered from a separate emergency bus to be considered OPERABLE.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

In OPERATIONAL CONDITIONS 1, 2, and 3, a conventional service water pump must be capable of supplying water to both the nuclear header and the conventional header to be considered OPERABLE. This will ensure that the vital header and RHR service water heat exchangers can be supplied from either header when a single failure of any header isolation valve is assumed and personnel access is not available for manual valve alignment. In OPERATIONAL CONDITIONS 4 and 5, because of reduced primary pressure, the possibility of a LOCA is not considered credible and access is considered available to manually position header isolation valves if required. Therefore, in OPERATIONAL CONDITIONS 4 and 5, a conventional pump may be considered OPERABLE when only the nuclear header discharge valve is OPERABLE except as specifically identified in the ACTION statement for a nuclear header outage. This allows maintenance on the conventional header without reducing service water system OPERABILITY. However, a conventional pump aligned to the nuclear header is not considered to meet the requirements for an OPERABLE nuclear pump since it is not automatically powered and restarted on the diesel generators following an accident signal.

For OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5, and a DBA in either unit, two nuclear service water pumps from one or both units are capable of supplying sufficient flow to cool all four emergency diesel generators under worst-case scenarios while also supplying flow to other potential flow paths (vital header loads, cross-header leakage, and lubewater). To prohibit any single failure from preventing the supply of service water to the diesel generators during the first 10 minutes following a DBA, at least three nuclear service water pumps per site are required while in OPERATIONAL CONDITIONS 1, 2, 3, 4, or 5.

After the first ten minutes following a DBA, additional loads may require cooling water on the affected unit. These loads include RHR and CS pump room coolers, RHR service water heat exchangers, and RHR pump seal heat exchangers. Evaluations have determined that the RHR pump seals, as well as the equipment in rooms serviced by the RHR and CS room coolers, remain within the manufacturers' temperature limits for at least the first ten minutes of a DBA. Operator action is credited after the first 10 minutes following a DBA to make the necessary pump and valve alignments either remotely or manually, except that manual action inside the Reactor Building following a LOCA while in OPERATIONAL CONDITIONS 1, 2, and 3 is not credited because of the potential for unsafe conditions.

In OPERATIONAL CONDITIONS 1, 2, and 3, one conventional service water pump supporting the affected unit is capable of supplying the additional required safety-related and shutdown equipment. No single failure can prevent the necessary loads from being aligned to one of the nuclear or conventional headers by manual or remote operator action. To prohibit any single failure from preventing the supply of service water after the first 10 minutes following a DBA, at least two operable conventional service water pumps are required while in OPERATIONAL CONDITIONS 1, 2, or 3.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

In OPERATIONAL CONDITIONS 4 and 5, one unit service water pump, nuclear or conventional, is capable of supplying the additional required safety-related and shutdown equipment. Manual action in the Reactor Building is credited to align equipment to the nuclear header if required. To prohibit any single failure from preventing the supply of service water after the first 10 minutes following a DBA, at least two OPERABLE unit service water pumps, nuclear or conventional, are required while in OPERATIONAL CONDITIONS 4 and 5.

The allowed out-of-service times and compensatory measures established in the ACTION statements are conservative. Although the probability and consequences of a DBA are reduced in OPERATIONAL CONDITIONS 4 and 5, the ACTION statements for the nuclear service water pumps for a unit in OPERATIONAL CONDITIONS 4 or 5 are based on the assumption that the other unit is in OPERATIONAL CONDITIONS 1, 2, or 3. Specific ACTION statements and LCO time limits have not been established for both units in OPERATIONAL CONDITIONS 4 or 5 since the ACTION statements for one unit in OPERATIONAL CONDITIONS 4 or 5 are more conservative.

In OPERATIONAL CONDITIONS 4 and 5, because of reduced core decay heat load, the reduced possibility of a LOCA, and the accessibility to the reactor building for manual operator action, the vital header loads could be manually aligned to the nuclear header if a failure prevented remote valve alignment. Therefore, the operability requirements for the unit service water pumps apply for nuclear or conventional pumps. With one OPERABLE unit service water pump, the core spray and LPCI systems remain OPERABLE. However, to minimize the possibility of loss of these systems due to loss of the single pump, the out-of-service time for one OPERABLE unit service water pump is set at 7 days. For no OPERABLE unit service water pumps, the core spray and LPCI systems must be declared inoperable. This is equivalent to the ACTION statement for core spray and LPCI systems inoperable.

ACTION statement 3.7.1.2.b.4 for OPERATIONAL CONDITIONS 4 and 5 allows one unit to operate with the nuclear service water header inoperable for up to 14 days provided that:

a) two nuclear service water pumps are OPERABLE on the other unit,
b) both unit's nuclear service water header valves are administratively controlled as required to ensure cooling water to the diesel generators,
c) the service water system conventional header is OPERABLE with two unit conventional service water pumps OPERABLE, and
d) vital ECCS loads are aligned to the conventional service water system header.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

Considering any additional single failure, this requirement ensures at least one OPERABLE nuclear service water pump to supply the Diesel Generators during the first 10 minutes after a DBA and one OPERABLE conventional service water pump to supply the unit safety-related and shutdown cooling loads following the first 10 minutes after a DBA. By requiring administrative control of both unit's nuclear header valves, the ACTION statement minimizes the risk of inadvertent valve action that could reduce cooling water flow to the diesel generators.

3/4.7.1 SERVICE WATER SYSTEMS (Continued)

demonstrate operation in OPERATIONAL CONDITIONS 1 through 3 with no OPERABLE nuclear service water pumps is acceptable provided that at least two nuclear service water pumps are OPERABLE on the opposite unit and two conventional pumps are OPERABLE on the affected unit. Specific ACTION statements and LCO time limits for this situation have not been developed since a more conservative ACTION Statement has been established in order to minimize the risk of personnel error in administrating this situation.

3/4.7.2 CONTROL ROOM EMERGENCY FILTRATION SYSTEM

The OPERABILITY of the control room ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less, whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 10 of Appendix "A", 10 CFR Part 50.

3/4.7.3 FLOOD PROTECTION

The limitation on flood protection ensures that facility protective actions will be taken and operation will be terminated in the event of flood conditions. The limit of elevation 17'6" Mean Sea Level is based on the maximum elevation at which facility flood control measures provide protection to safety-related equipment.

3/4.7.4 REACTOR CORE ISOLATION COOLING SYSTEM

The reactor core isolation cooling system (RCICS) is provided to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without requiring actuation of any of the Emergency Core Cooling equipment. RCICS is conservatively required to be OPERABLE whenever reactor pressure exceeds 113 psig even though the Residual Heat Removal (RHR) system provides adequate core cooling up to 150 psig. The condensate storage tank provides sufficient water to reduce the reactor coolant temperature and pressure to permit the RHR system to be operated.