ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES

REQUEST FOR LICENSE AMENDMENT
SALEM GENERATING STATION UNITS 1 AND 2
FACILITY OPERATING LICENSE NOS. DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

I. Description of Change

This amendment request proposes that existing Technical Specification 3.1.2.1, "BORATION SYSTEMS FLOW PATH - SHUTDOWN", be revised to add applicability for MODE 4. The operability requirement for the Boric Acid Storage Tank (BAT) has been clarified to reference Technical Specification 3.1.2.6a while in MODE 4 and 3.1.2.5a while in MODE 5 or 6. The operability requirement for the Refueling Water Storage Tank (RWST) has been clarified to reference Technical Specification 3.1.2.6b while in MODE 4 and 3.1.2.5b while in MODE 5 or 6.

This amendment request proposes that existing Technical Specification 3.1.2.2, "BORATION SYSTEMS FLOW PATH - OPERATION", be revised to delete applicability for MODE 4.

This amendment request proposes that existing Technical Specification 3.1.2.3, "CHARGING PUMP - SHUTDOWN", be revised such that:

- Applicability in MODE 4 has been added to the Technical Specification.
- A note is added to specify that a maximum of one centrifugal charging pump shall be operable in Mode 4 when the temperature of one or more of the RCS cold legs is less than or equal to 312°F, Mode 5 or Mode 6 when the head is on the reactor vessel.

This amendment request proposes that existing Technical Specification 3.1.2.4, "CHARGING PUMPS - OPERATING", be revised to delete applicability during MODE 4.

Bases Section 3/4.1.2 has also been revised for boration flow paths and charging pumps consistent with the above technical specification changes by reducing the number of operable charging pumps required for boron addition in Mode 4 from two to one.

The above changes are applicable to Salem Units 1 and 2.

This amendment change request also proposes to revise Salem Unit 1 Technical Specification 3.1.2.2, "BORATION SYSTEMS FLOW PATH - OPERATION", such that the Limiting Condition for Operation (LCO) is consistent with Salem Unit 2.

This amendment request proposes to delete in their entirety Technical Specifications 3.1.2.5 and 3.1.2.6, Boric Acid Transfer Pumps - Shutdown and Operating for Unit 1 only, and renumber existing Technical Specifications 3.1.2.7 and 3.1.2.8, Borated Water Sources, 3.1.2.5 and 3.1.2.6, respectively for consistency.

Also, renumbered Technical Specification LCO 3.1.2.6 for Unit 1 and existing Technical Specification 3.1.2.6 for Unit 2 were

revised to reference Technical Specification 3.1.2.1. LCO 3.1.2.6 is applicable in MODE 4.

Bases 3/4.1.2, Boration Systems, for Unit 1 and 2 has also been revised to reflect the proposed changes above and to be consistent with the Bases of Technical Specification 3.5.3 which allows one centrifugal charging pump to be operable without single failure consideration on the basis of the stable reactivity condition of the reactor.

II. Reason For Proposed Change

The current technical specification requirements for charging pumps and the boration flow paths for operation in Mode 4 are not consistent with the current ECCS requirements and the limitations imposed by the Cold Overpressure Protection analysis.

The Emergency Core Cooling System (ECCS) requirements assume that only one centrifugal charging pump, capable of taking suction from the Refueling Water Storage Tank (RWST), will be available below 350°F without single failure considerations on the bases of the stable reactivity condition of the reactor and limited core cooling requirements. The Cold Overpressure Protection analysis assumes a maximum of one centrifugal charging pump (or safety injection pump) will be operable whenever the temperature of one or more RCS cold legs is ≤312°F. These requirements are reflected in LCO 3.5.3.

During Mode 4 with the RCS temperature between 200°F and 350°F, Technical Specification 3.1.2.4 currently requires at least two charging pumps to be operable, and does not differentiate between centrifugal or positive displacement type charging pumps. Technical Specification Limiting Condition for Operation 3.5.3, Emergency Core Cooling System (ECCS) Subsystems - T avg <350°F, requires a maximum of one safety injection pump or one centrifugal charging pump operable whenever the temperature of one or more of the RCS cold legs is less than or equal to 312°F. Therefore, in order to meet the requirements of Technical Specification 3.1.2.4 when RCS temperatures are above 200°F and one or more RCS cold legs are less than or equal to 312°F, the positive displacement charging pump and one centrifugal charging pump are required to be operable. The Emergency Core Cooling System (ECCS) requirements (LCO 3.5.3) assume that, as a minimum, one centrifugal charging pump will be available below 350°F without single failure considerations.

Based on the above, consistent with the Bases for ECCS Technical Specification 3.5.3, Technical Specifications 3.1.2.1 thru 3.1.2.4 have been revised to require only one charging pump to be operable in Mode 4 and below. The Mode 4 Applicability has been deleted from LCOs 3.1.2.2 and 3.1.2.4, and the Mode 4

Applicability was added to LCOs 3.1.2.1 and 3.1.2.3. The addition of the Mode 4 Applicability to LCOs 3.1.2.1 and 3.1.2.3 requires that the references for BAT and RWST Operability include Technical Specification 3.1.2.6 (renumbered Unit 1 Technical Specification 3/4.1.2.8), Borated Water Sources - Operating which are applicable in Modes 1 thru 4. For consistency, Technical Specification LCO 3.1.2.6 was also revised to reference 3.1.2.1 which is still applicable in Mode 4.

Unit 1 Technical Specifications 3.1.2.5 and 3.1.2.6 for Boric Acid Transfer Pumps during Shutdown and Operation are proposed to be deleted. The requirements for transfer pump operability are adequately addressed in Technical Specifications 3.1.2.1 and 3.1.2.2 which specify the boron injection flow paths to be operable and the components required to perform this function. This is consistent with the present Unit 2 Technical Specifications which do not have a specific requirement for Boric Acid Transfer Pump operability.

In changing the Unit 1 boration flow path LCO 3.2.1.2 to be consistent with Unit 2, greater flexibility will be provided by crediting the two charging pump flow paths from the Refueling Water Storage Tank (RWST), and extending the Allowed Outage Time (AOT) for the LCO if two of three flow paths are inoperable from 1 hour to 72 hours.

III. Justification for the Proposed Change

Charging pumps and the associated flow paths are used to control the boron concentration in the Reactor Coolant System during normal operation, and to provide high-pressure safety injection for emergency core cooling and boron addition during accident conditions.

The boron injection system ensures that negative reactivity control is available during each mode of facility operation to ensure shutdown margin (SDM) requirements are maintained. SDM requirements provide sufficient reactivity margin to ensure that acceptable fuel design limits will not be exceeded for normal shutdown and anticipated operational occurrences. In Mode 4, the reactivity control systems, (i.e., control rods and dissolved boric acid) maintain the reactor core subcritical.

Per the Bases of the current ECCS LCO 3.5.3, one operable ECCS subsystem is acceptable with RCS temperature below 350°F without single failure consideration on the bases of the stable reactivity condition of the reactor and the limited core cooling requirements. The bases of the current ECCS LCO 3.5.3 is consistent with the new Standard Technical Specifications contained in NUREG-1431.

Thus, the current CVCS requirement to have two charging pumps and their flow paths operable when the RCS temperature is between 350°F and 200°F (lower bound of Mode 4) is inconsistent with the assumptions of the ECCS and the Cold Overpressure Protection analysis (POPS). Therefore, the Mode 4 Applicability has been deleted from LCOs 3.1.2.2 and 3.1.2.4, and the Mode 4 Applicability was added to LCOs 3.1.2.1 and 3.1.2.3 consistent with the requirements of LCO 3.5.3.

The operability requirement for the Boric Acid Storage Tank (BAT) has been clarified to reference Technical Specification 3.1.2.6a while in MODE 4 and 3.1.2.5a while in MODE 5 or 6. The operability requirement for the Refueling Water Storage Tank (RWST) has been clarified to reference Technical Specification 3.1.2.6b while in MODE 4 and 3.1.2.5b while in MODE 5 or 6. For Salem Unit 1, as currently stated in Bases 3/4.1.2, Boration Systems, adequate boration capability from a BAT in accordance with Technical Specification Table 3.1-2 and additional makeup from either the second boric acid tank and/or batching, or the RWST is available to achieve cold shutdown (below 200°F). If the RWST is the only source of boration, a sufficient volume of borated water is available to achieve a cooldown to 200°F. In Mode 1 thru 4, both the BAT and the RWST are required to be operable. Therefore, without single failure consideration when the RCS is at a temperature below 350°F, one boron injection system flow path via the BAT and/or the RWST thru at least one charging pump is acceptable in Modes 4, 5 and 6.

Deletion of Unit 1 Technical Specifications 3.1.2.5 and 3.1.2.6 for Boric Acid Transfer Pumps during Shutdown and Operation is consistent with the present Unit 2 Technical Specifications which do not have a specific requirement for Boric Acid Transfer Pump operability. The requirements for Boric Acid Transfer Pump operability are adequately addressed in Technical Specifications 3.1.2.1 and 3.1.2.2 which specify the boron injection flow paths to be operable and the components required to perform this function. This includes the availability of the transfer pumps to meet this Technical Specification requirement.

Revision to the Unit 1 Technical Specifications has been implemented by Amendment 145 to reduce the boron concentration in the BATs. Revision to the Unit 2 Technical Specifications to reduce the boron concentration in the BATs is scheduled to be implemented prior to restart following the eighth refueling outage (Fall, 1994)(Amendment 133). The present Unit 2 Bases 3/4.1.2 as well as the proposed changes to reduce the boron concentration in the BATs supports the proposed changes contained herein that one boron injection system flow path via the BAT and/or the RWST thru at least one charging pump is acceptable in Modes 4, 5 and 6.

The limitation for a maximum of one centrifugal charging pump to be operable below 312°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single POPS relief valve. This guidance is currently contained in specification 3.5.3, "ECCS - T avg <350°F". (It is noted that a revision to this guidance was implemented by Amendments 150/130 to clarify applicability in Modes 4, 5 and 6.) However, since specification 3.5.3 is only applicable in Mode 4, it was felt prudent to restate the guidance in Specification 3.1.2.3, applicable in Modes 4, 5 and 6, for clarity.

The design and functional requirements of the charging pump flow paths for Unit 2 are similar to Salem Unit 1. The Salem Unit 1 and 2 flow paths each utilize a common line from the RWST and parallel paths for active components, thus providing protection from a single active failure. Therefore, the current bases for the Unit 2 Technical Specification for boration system flow paths via the charging pumps supports the use of a similar Unit 2 LCO 3.1.2.2 for Salem Unit 1. In addition, minor editorial changes to clarify the boration flow paths were also incorporated into Technical Specification LCOs 3.1.2.1, 3.1.2.2 and 3.1.2.6 for Units 1 and 2.

IV. Significant Hazards Consideration

PSE&G has, pursuant to 10CFR50.92, reviewed the proposed amendment to determine whether our request involves a Significant Hazards Consideration. We have determined that operation of Salem Units 1 and 2 in accordance with the proposed change:

1. Will not involve a significant increase in the probability or consequences of an accident or malfunction of equipment important to safety previously evaluated.

The Emergency Core Cooling System (ECCS) requirements assume that only one charging pump will be available below 350°F without single failure considerations on the bases of the stable reactivity condition of the reactor and limited core cooling requirements. Therefore, the Mode 4 Applicability has been deleted from LCOs 3.2.1.2 and 3.2.1.4, and was added to LCOs 3.2.1.1 and 3.2.1.3 consistent with the requirements of LCO 3.5.3.

The current Bases for the Unit 2 Technical Specification for boration system flow paths via the charging pumps supports the use of a similar LCO for Salem Unit 1.

The limitation for a maximum of one centrifugal charging pump to be operable when the RCS temperature is less than or equal to 312°F has been added to LCO 3.1.2.3 for clarity and is consistent with the Cold Overpressure Protection (POPS) analysis and the requirements of Technical Specification 3.5.3.

The requirements for Boric Acid Transfer Pump operability are adequately addressed in Technical Specifications 3.1.2.1 and 3.1.2.2 which specify the boron injection flow paths to be operable and the components required to perform this function. This includes the availability of the transfer pumps to meet this Technical Specification requirement.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated in the UFSAR.

2. Will not create the possibility of a new or different kind of accident from any previously evaluated.

As discussed in response to Question 1 above, the proposed amendment to the number of charging pumps required to be operable in Mode 4 is consistent with the current Technical Specification requirements for the ECCS LCO and the POPS. The current bases for the Unit 2 Technical Specification for boration system flow paths via the charging pumps supports the use of a similar LCO for Salem Unit 1. The requirements for Boric Acid Transfer Pump operability for Unit 1 are adequately addressed in Technical Specifications 3.1.2.1 and 3.1.2.2 which specify the boron injection flow paths to be operable and the components required to be available to perform this function including the transfer pumps. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Will not involve a significant reduction in a margin of safety.

The proposed amendment to the number of charging pumps required to be operable in Mode 4 will not result in any changes to the assumptions or conditions for the current ECCS analysis and POPS analysis. The current bases for the Unit 2 Technical Specification for boration system flow paths via the charging pumps supports the use of a similar LCO for Salem Unit 1 (i.e., the Bases are essentially the same). The requirements for Boric Acid Transfer Pump operability for Unit 1 are adequately addressed in Technical Specifications 3.1.2.1 and 3.1.2.2 which specify the boron injection flow paths to be operable and the components required to be available to perform this function including the transfer pumps. Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Conclusions

Based on the above, PSE&G has determined that the proposed amendment does not involve a Significant Hazards Consideration.

ATTACHMENT 2

TECHNICAL SPECIFICATION MARKED-UP PAGES

REQUEST FOR LICENSE AMENDMENT
SALEM GENERATING STATION UNITS 1 AND 2
FACILITY OPERATING LICENSE NOS. DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

TECHNICAL SPECIFICATION PAGES WITH PEN AND INK CHANGES

The following Technical Specifications are affected by this requested amendment:

Facility Operating License No. DPR-70 (Unit 1)

Technical Specification	Page
3/4.1.2.1	3/4 1-7
3/4.1.2.2	3/4 1-8
3/4.1.2.3	3/4 1-10
3/4.1.2.4	3/4 1-11
3/4.1.2.5	3/4 1-12
3/4.1.2.6	3/4 1-13
3/4.1.2.7	3/4 1-14
3/4.1.2.8	3/4 1-16
B3/4.1.2	B 3/4 1-3

Technical Specification	Page

Facility Operating License No. DPR-75 (Unit 2)

3/4.1.2.1	3/4 1-7
3/4.1.2.2	3/4 1-8
3/4.1.2.3	3/4 1-9
3/4.1.2.4	3/4 1-10
3/4.1.2.6	3/4 1-12
B3/4.1.2	B 3/4 1-3

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

Per specification 3.1.2.6a while in MODE 4, or per specification 3.1.2.5a while in MODES 5 or 6,

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

a. A flow path from the boric acid tanks via a boric acid transfer pump and charging pump to the Reactor Coolant System if ~~only~~ the boric acid storage ~~tank in Specification 3.1.2.7a~~ is OPERABLE; or

b. ~~The~~ flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if ~~only~~ the refueling water storage tank ~~in Specification 3.1.2.7b~~ is OPERABLE.

per specification 3.1.2.6b while in MODE 4, or per specification 3.1.2.5b while in MODE 5 or 6,

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one injection path is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. When the boric acid tank is a required water source, by verifying at least once per 7 days that:

   (1) The flow path from the boric acid tank to the boric acid transfer pump, the boric acid transfer pump, and the recirculation path from the boric acid transfer pump to the boric acid tank is ≥ 63°F, and

   (2) The flow path between the boric acid transfer pump recirculation line to the charging pump suction line is ≥50°F,

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

REACTIVITY CONTROL SYSTEMS

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 ~~Each~~ At least two of the following three boron injection flow paths shall be OPERABLE:

a. ~~The~~ A flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System, ~~and~~

b. ~~The~~ Two flow paths from the refueling water storage tank via charging pumps to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, 3 and ~~4~~

ACTION:

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a. With the flow path from the boric acid tanks inoperable, restore the inoperable flow path to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore the flow path to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the flow path from the refueling water storage tank inoperable, restore the flow path to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.2 Each of the above required flow paths shall be demonstrated OPERABLE:

a. By verifying at least once per 7 days that:

(1) The flow path from the boric acid tank to the boric acid transfer pump and from the recirculation line back to the boric acid tank is ≥ 63°F, and

(2) the flow path between the boric acid tank recirculation line to the charging pump suction line is ≥ 50°F,

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

Insert A for page 3/4 1-8

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE.#

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until one charging pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.3 No additional Surveillance Requirements other than those required by Specification 4.0.5.

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A maximum of one centrifugal charging pump shall be OPERABLE while in MODE 4 when the temperature of one or more of the RCS cold legs is less than or equal to 312°F, MODE 5, or MODE 6 when the head is on the reactor vessel.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4 No additional Surveillance Requirements other than those required by Specification 4.0.5.

REACTIVITY CONTROL SYSTEMS

BORIC ACID TRANSFER PUMPS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.5 At least one boric acid transfer pump shall be OPERABLE if only the flow path through the boric acid transfer pump of Specification 3.1.2.1a is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no boric acid transfer pump OPERABLE as required to complete the flow path of Specification 3.1.2.1a, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one boric acid transfer pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.5 No additional Surveillance Requirements other than those required by Specification 4.0.5.

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REACTIVITY CONTROL SYSTEMS

BORIC ACID TRANSFER PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least one boric acid transfer pump in the boron injection flow path required by Specification 3.1.2.2a shall be OPERABLE if the flow path through the boric acid pump in Specification 3.1.2.2a is OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With no boric acid transfer pump OPERABLE, restore at least one boric acid transfer pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F, restore at least one boric acid transfer pump to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 No additional Surveillance Requirements other than those required by Specification 4.0.5.

DELETE THIS TECHNICAL SPECIFICATION IN ITS ENTIRETY

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.(5/1) As a minimum, one of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum contained volume of 2,600 gallons,

2. Between 6,560 and 6,990 ppm of boron, and,

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained volume of 37,000 gallons,

2. A minimum boron concentration of 2300 ppm, and

3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one borated water source is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.(5/1) The above required borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water at least once per 7 days by:

1. Verifying the boron concentration of the water,

2. Verifying the water level of the tank, and

3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by specification 3.1.2.1 and 3.1.2.2:

a. A boric acid storage system with:

1. A contained volume of borated water in accordance with figure 3.1-2,

2. A boron concentration in accordance with figure 3.1-2, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A contained volume of between 364,500 and 400,000 gallons of water,

2. A boron concentration of between 2,300 and 2,500 ppm, and

3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required boration water systems, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta K/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include: 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above ~~200~~ ≥ 350 °F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.6% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability (minimum boration volume) requirement is established to conservatively bound expected operating conditions throughout core operating life. The analysis assumes that the most reactive control rod is not inserted into the core. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires borated water from a boric acid tank in accordance with TS Figure 3.1-2, and additional makeup from either: (1) the second boric acid tank and/or batching, or (2) a maximum of 41,800 gallons of 2,300 ppm borated water from the refueling water storage tank. With the refueling water storage tank as the only borated water source, a maximum of 73,800 gallons of 2,300 ppm borated water is required. However, to be consistent with the ECCS requirements, the RWST is required to have a minimum contained volume of 350,000 gallons during operations in MODES 1, 2, 3 and 4.

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.75% and 4.0% by weight. To ensure that the boric acid remains in solution, the tank fluid temperature and the process pipe wall temperatures are monitored to ensure a temperature of 63°F, or above is maintained. The tank fluid and pipe wall temperatures are monitored in the main control room. A 5°F margin is provided to ensure the boron will not precipitate out.

Should ambient temperature decrease below 63°F, the boric acid tank heaters, in conjunction with boric acid pump recirculation, are capable of maintaining the boric acid in the tank and in the pump at or above 63°F. A small amount of boric acid in the flowpath between the boric acid recirculation line and the suction line to the charging pump will precipitate out, but it will not cause flow blockage even with temperatures below 50°F.

With the RCS temperature below ~~200~~ 350 °F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

per specification 3.1.2.6a while in MODE 4, or per specification 3.1.2.5a while in MODE 5 or 6,

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

a. A flow path from the boric acid tanks via a boric acid transfer pump and charging pump to the Reactor Coolant System if the boric acid storage ~~tank in Specification 3.1.2.5a~~ system is OPERABLE; or

b. ~~The~~ A flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if the refueling water storage tank ~~in Specification 3.1.2.5b~~ is OPERABLE.

per specification 3.1.2.6b while in MODE 4, or per specification 3.1.2.5b while in MODE 5 or 6

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one injection path is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. When the boric acid tank is a required water source, by verifying at least once per 7 days that:

(1) The flow path from the boric acid tank to the boric acid transfer pump, the boric acid transfer pump, and the recirculation path from the boric acid transfer pump to the boric acid tank is ≥ 63°F, and

(2) The flow path between the boric acid transfer pump recirculation line to the charging pump suction line is ≥ 50°F,

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

REACTIVITY CONTROL SYSTEMS

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 At least two of the following three boron injection flow paths shall be OPERABLE:

a. ~~The~~ flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System.

b. Two flow paths from the refueling water storage tank via charging pumps to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.2 Each of the above required flow paths shall be demonstrated OPERABLE:

a. By verifying at least once per 7 days that:

(1) The flow path from the boric acid tank to the boric acid transfer pump and from the recirculation line back to the boric acid tank is ≥ 63°F, and

(2) The flow path between the boric acid tank recirculation line to the charging pump suction line is ≥ 50°F,

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal.

d. At least once per 18 months by verifying that the flow path required by Specification 3.1.2.2.a delivers at least 33 gpm to the Reactor Coolant System.

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE. #

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until one charging pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.3 No additional Surveillance Requirements other than those required by Specification 4.0.5.

INSERT "A" ATTACHED

Insert A for page 3/4 1-9

A maximum of one centrifugal charging pump shall be OPERABLE while in MODE 4 when the temperature of one or more of the RCS cold legs is less than or equal to 312°F, MODE 5, or MODE 6 when the head is on the reactor vessel.

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4 No additional Surveillance Requirements other than those required by Specification 4.0.5.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.1 and

3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by Specification 3.1.2.2:

a. A boric acid storage system with:
   1. A contained volume of borated water in accordance with figure 3.1-2,
   2. A Boron concentration in accordance with Figure 3.1-2, and
   3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:
   1. A contained volume of between 364,500 and 400,000 gallons of water,
   2. A boron concentration of between 2,300 and 2,500 ppm, and
   3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water at least once per 7 days by:
   1. Verifying the boron concentration in each water source.
   2. Verifying the water level of each water source, and
   3. Verifying the boric acid storage system solution temperature.

b. For the refueling water storage tank by:
   1. Verifying the boron concentration at least once per 7 days,
   2. Verifying the borated water volume at least once per 7 days, and
   3. Verifying the solution temperature at least once per 24 hour when the outside air temperature is less than 35°F.

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include: 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature ~~above 200°F~~ ≥ 350°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.6% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability (minimum boration volume) requirement is established to conservatively bound expected operating conditions throughout core operating life. The analysis assumes that the most reactive control rod is not inserted into the core. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires borated water from a boric acid tank in accordance with TS Figure 3.1-2, and additional makeup from either: (1) the second boric acid tank and/or batching, or (2) a maximum of 41,800 gallons of 2,300 ppm borated water from the refueling water storage tank. With the refueling water storage tank as the only borated water source, a maximum of 73,800 gallons of 2,300 ppm borated water is required. However, to be consistent with the ECCS requirements, the RWST is required to have a minimum contained volume of 350,000 gallons during operations in MODES 1, 2, 3 and 4.

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.75% and 4% by weight. To ensure that the boric acid remains in solution, the tank fluid temperature and the process pipe wall temperatures are monitored to ensure a temperature of 63°F, or above is maintained. The tank fluid and pipe wall temperatures are monitored in the main control room. A 5°F margin is provided to ensure the boron will not precipitate out.

Should ambient temperature decrease below 63°F, the boric acid tank heaters, in conjunction with boric acid pump recirculation, are capable of maintaining the boric acid in the tank and in the pump at or about 63°F. A small amount of boric acid in the flowpath between the boric acid recirculation line and the suction line to the charging pump will precipitate out, but it will not cause flow blockage, even with temperatures below 50°F.

With the RCS temperature below ~~200~~ 350°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE OPERATIONS and positive reactivity change in the event the single injection system becomes inoperable.