PSEG Nuclear LLC
P.O. Box 236,, Hancocks Bridge, NJ 08038-0236

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Nuclear L.L.C.

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10 CFR 50.90

LR-N09-0042
LAR S09-01

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Generating Station, Unit 1 and 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: **License Amendment Request to Revise the Definition of Fully Withdrawn for the Rod Cluster Control Assemblies**

References: (1) Letter from NRC to PSEG: "Redefinition of Fully Withdrawn (TAC Nos. 71834/71835), Salem Nuclear Generating Station, Unit Nos. 1 and 2," dated March 22, 1989

In accordance with the provisions of 10CFR50.90, PSEG Nuclear LLC (PSEG) requests an amendment to the facility operating licenses listed above.

These proposed changes revise the definition of the fully withdrawn position of the Rod Cluster Control Assemblies (RCCA) to minimize localized RCCA wear. Currently, the fully withdrawn position for the RCCAs is defined as between 222 and 228 steps above rod bottom. The proposed change will allow the fully withdrawn position to be between 222 and 230. This change is consistent with the RCCA vendor's recommendation, with the information previously provided in NRC Information Notice 87-19, and is an expansion of the RCCA axial repositioning program initiated by Salem Amendments 91 and 66 (Reference 1).

Attachment 1 of this submittal provides an evaluation supporting the proposed changes. Attachment 2 provides the marked-up TS pages, with the proposed changes indicated. Attachment 3 provides, for information only, the marked-up TS Bases pages. No regulatory commitments are contained in this submittal.

PSEG requests approval of the proposed changes by March 31, 2010, to support implementation following Salem Unit 1 Spring outage 1R20[1].

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[1] The change will be subsequently implemented for Unit 2 following outage 2R18, scheduled for Spring 2011.

A001
NRR

In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

If you have any questions or require additional information, please do not hesitate to contact Mr. Jeff Keenan at (856) 339-5429.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 3/22/09
(Date)

Sincerely,

Robert C. Braun
Site Vice President
Salem Generating Station

Attachments (3)

S. Collins, Regional Administrator - NRC Region I
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Salem
P. Mulligan, Manager IV, NJBNE
Commitment Coordinator - Salem
PSEG Corporate Commitment Manager

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
Revise the Definition of Fully Withdrawn for the Rod Cluster Control Assemblies

Table of Contents

1 .0 DESCRIPTION

In accordance with the provisions of 10CFR50.90, PSEG Nuclear LLC (PSEG) requests an amendment to the facility operating licenses listed above.

These proposed changes revise the definition of the fully withdrawn position of the Rod Cluster Control Assemblies (RCCA) to minimize localized RCCA wear. Currently, the fully withdrawn position for the RCCAs is defined as between 222 and 228 steps above rod bottom. The proposed change will allow the fully withdrawn position to be between 222 and 230. This change is consistent with the RCCA vendor's recommendation, with the information previously provided in NRC Information Notice 87-19, and is an expansion of the RCCA axial repositioning program initiated by Salem Amendments 91 and 66 (Reference 1).

2.0 PROPOSED CHANGES

TS Definition 1.13a, FULLY WITHDRAWN, is revised as follows:

> FULLY WITHDRAWN shall be the condition where control and/or shutdown banks are at a position which is within the interval of 222 to ~~228~~-230 steps withdrawn, inclusive. FULLY WITHDRAWN will be specified in the current reload analysis.

Note the wording in the Unit 2 TS Definition 1.13a is being slightly revised to be consistent with the Unit 1 wording; "specified in" replaces the words "established by". Refer to the mark-up in Attachment 2.

TS 3.1.3.3 is revised as follows:

> The individual full length (shutdown and control) rod drop time from ~~228~~-230 steps withdrawn shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:
>
> a. T_{avg} greater than or equal to 541 degrees F, and
>
> b. All reactor coolant pumps operating.

Note the wording in Unit 1 TS 3.1.3.3 is being slightly revised to be consistent with the Unit 2 wording; the "≤" symbol is being replaced with the words "less than or equal to", and the "≥" symbol is being replaced with the words "greater than or equal to". Refer to the mark-up in Attachment 2.

TS 3.1.3.2.1 is also impacted by this change; the shutdown and control rod position indication systems will also reflect the revised fully withdrawn position of 230. Refer to the mark-up in Attachment 2.

3.0 BACKGROUND

During Salem Unit 1 Fall outage 2005 (1R17), RCCA examinations were conducted on 53 RCCAs by the Salem RCCA vendor AREVA NP. The examinations were conducted to investigate possible clad wear indications at certain guide card locations, at the continuous guide block area and at the tip of each pin. These examinations were consistent with issues previously identified in NRC Information Notice 87-19, and with previous RCCA repositioning

actions taken to address the issues (Reference 1). Information Notice 87-19 identified the potential for RCCA clad wear when the RCCAs are left "parked" in the same FULLY WITHDRAWN position over several cycles. The wear is a result of core flow induced vibration which causes contact between the RCCAs cladding and the RCCA guide cards located in the upper reactor internals.

Both eddy current (ET) and ultrasound (UT) techniques were employed to measure the clad wear. The ET examinations provided an estimation of clad wear in terms of loss of cross-sectional area; the follow-up UT examinations provided more detail including depth, azimuth, circumferential extent and shape. The examination results indicated 49 of the 53 RCCAs had wear indications; none exceeded the acceptance criteria for continued use[2]. In order to minimize the accrual of wear during future operation, AREVA NP has recommended that the axial repositioning program, initiated by Reference 1, be expanded to include axial positions above 228. AREVA NP also recommended that the axial repositioning of RCCAs be continuously cycled each refuel outage to further minimize wear. This will maximize the wear area against the guide card and may also change the flow induced vibration characteristics of the rods tips in the guide tubes. The specific FULLY WITHDRAWN position will be specified in the reload analysis for each cycle (as per TS Definition 1.13a).

4.0 TECHNICAL ANALYSIS

The RCCA repositioning program is proposed to be expanded to include two steps, 229 and 230, in the definition of FULLY WITHDRAWN. This change has been evaluated to determine the effect on reactor physics, transient analysis (Non-LOCA), LOCA analysis, and mechanical analysis. The evaluations are discussed below.

Reactor Physics Considerations

The current analyzed FULLY WITHDRAWN positions are between 222 and 228 (position 225 is the top of the active fuel region). The proposed change will redefine FULLY WITHDRAWN to be between 222 and 230. No change is being made to the lowest allowable position; therefore prior assessments regarding minimal rod insertion into the active fuel region remain applicable and unchanged. Consequently, there is no impact on previously analyzed conditions for both axial and radial power distributions, critical boron concentrations and temperature dependent shutdown margins.

Non-LOCA Transient Analysis Considerations

No change is being made to the lowest allowable position; prior assessments regarding minimal rod insertion into the active fuel region remain applicable and unchanged. Therefore there will be no power distribution related effect on the accident analyses for the proposed change.

The change to allow for the RCCAs to be withdrawn to the 230 position is two steps higher than the current TS limit. Withdrawing the RCCAs further out of the core results in longer insertion times into the core. TS 3.1.3.3 currently states that for Modes 1 and 2:

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[2] Subsequent outage inspection results for Salem Unit 2 (during outage 2R16) have provided comparable data, supporting the recommendation to expand the axial positioning program.

The individual full length (shutdown and control) rod drop time from 228 steps withdrawn shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

a. T_{avg} *greater than or equal to 541 degrees F, and*

b. *All reactor coolant pumps operating.*

Rod drop times are measured prior to power operation following a refueling outage (TS Surveillance 4.1.3.3).

Utilizing data from the most recent three Salem cycles (both Unit 1 and 2), a calculation was performed to determine the maximum rod drop time from a fully withdrawn position of 230.

For each set of rod drop tests, the time to reach the dashpot was measured for each of the 53 RCCA locations. From the six sets of measurements the largest standard deviation was used along with a conservative tolerance factor to estimate the longest potential drop time from 228 steps to the dashpot at 1.4568 seconds.

The number of rod steps from the current upper location of 228 steps to the dashpot is 196 rod steps. Taking the longest time over the distance from 228 to the dashpot results in 0.0074 sec/step (1.4568 / 196 steps). For the two additional steps to 230, the net additional time is 0.0148 seconds (0.0074 x 2). Therefore the longest expected total rod drop time from position 230 is: 1.4658 + 0.0148 = 1.4716 seconds (this bounds both Salem Units 1 and 2).

The total maximum time of 1.4716 seconds is a small increase from the current measurements from 228 steps. The RCCA negative reactivity insertion characteristics from 230 steps withdrawn will remain bounded by the accident analysis assumption of 2.7 seconds, thus the proposed change does not result in a significant reduction in the margin of safety assumed in the UFSAR. Prior to each operating cycle the actual rod drop times are required to be confirmed as less than or equal to 2.7 seconds per TS Surveillance 4.1.3.3.

<u>LOCA Considerations</u>

The implementation of the revised RCCA repositioning program will have no adverse implications on the UFSAR LOCA related analyses. The impact of the RCCA repositioning program on the following areas has been evaluated:

- Large and Small Break LOCA Analyses
- Hot Leg Switchover Calculation
- Post-LOCA Long-Term Core Cooling

As previously discussed, there is no impact on either the radial or axial power distributions from the implementation of the revised repositioning program. Since there is no change related to these parameters, there is no impact on Small Break LOCA events. The revised RCCA repositioning program also does not impact Large Break LOCA analysis. The LOCA analysis used to determine the core response in terms of peak clad temperature and cladding oxidation, does not take credit for the control rod insertion to shut down the reactor. Post-LOCA long term cooling and core subcriticality calculations do take credit for insertion of control rods. However, the net control rod reactivity worth is not impacted by the proposed change. As discussed

above, there is no impact on critical boron concentrations from the implementation of the RCCA repositioning program. Therefore, there will be no impact on the Hot Leg Switchover Calculation and Post-LOCA Long-Term Core Cooling potential.

Mechanical Considerations

There is no reduction in the capability of the RCCAs to function mechanically during design basis events. The mechanical impact of implementation of the revised RCCA repositioning program has been evaluated for the following areas:

- RCCA Tip Characteristics
- LOCA Hydraulic Forces
- Mechanical Integrity

The evaluation of the RCCA Tip Characteristics determined that withdrawal to the 230 position still ensures that the tips of the RCCAs remain engaged in the guide thimbles, ensuring that alignment between the RCCA fingers and the guide thimbles is always maintained.

The hydraulic forces resulting from a LOCA are applied to the RCCAs through openings in the guide thimbles within the fuel assemblies and through openings in the guide tubes in the upper internals. In the upper internals, a series of horizontal card type structures provide lateral support for the RCCA fingers at regular intervals along the length or the guide tube. Fuel assembly guide thimbles provide lateral support within the core region. Since the span lengths between lateral support locations will not be changed due to revised repositioning, forces and stresses will not be impacted.

The RCCAs will maintain their mechanical integrity and remain structurally intact during a design basis event. The RCCAs remain inserted in the guide thimbles by a sufficient margin even at the fully withdrawn position of 230 steps (the insertion is only reduced by approximately 1.25 inches, with approximately 5.70 inches of insertion remaining). The RCCAs and protective guide tubes (and thimbles) are subjected to the same mechanical stresses in any position from Step 222 to Step 230 due to the fixed lateral support locations in both the upper internals and the fuel assemblies.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

PSEG requests an amendment to the Salem Unit 1 and 2 Operating Licenses. These proposed changes revise the definition of the fully withdrawn position of the Rod Cluster Control Assemblies (RCCA) to minimize localized RCCA wear. Currently, the fully withdrawn position for the RCCAs is defined as between 222 and 228 steps above rod bottom. The proposed change will allow the fully withdrawn position to be between 222 and 230. This change is consistent with the RCCA vendor's recommendation, with the information previously provided in NRC Information Notice 87-19, and is an expansion of the RCCA axial repositioning program initiated by Salem Amendments 91 and 66. According to 10CFR50.92, "Issuance of amendment," paragraph (c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequence of an accident previously evaluated; or
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety.

PSEG has evaluated the proposed changes to the TS for the stations listed above, using the criteria in 10CFR50.92, and have determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards consideration.

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The revised RCCA definition of FULLY WITHDRAWN will not result in any design or regulatory limit being exceeded with respect to the safety analyses documented in the UFSAR. The change has been evaluated to determine the effect on reactor physics, transient analysis (Non-LOCA), LOCA analysis, and mechanical operation of the RCCAs. The evaluations have determined that the reload analysis and assumed control rod drop time parameters remain bounding. The specific FULLY WITHDRAWN position will be specified in the reload analysis for each operating cycle. Prior to each operating cycle the actual rod drop times are required to be confirmed as less than or equal to 2.7 seconds per TS Surveillance 4.1.3.3. In addition, since the change does not impact any conditions that would initiate a transient, the probability of previously analyzed events is not increased. Also, RCCA repositioning will reduce the possibility of rod cladding failure, thereby minimizing the chance of absorber material being introduced into the reactor coolant system. Therefore, the proposed changes will not significantly increase the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The RCCAs will continue to meet their functional requirements and will perform as designed during design basis events. The RCCAs will remain inserted in the guide thimbles of the fuel assemblies during operation with the proposed withdrawal limits; therefore their performance is unaffected by this change. The RCCAs will maintain their mechanical integrity and remain structurally intact during a design basis event. The effect of periodically repositioning the RCCAs is bounded by the analyses in the UFSAR. Also, RCCA repositioning will reduce the possibility of rod cladding failure, thereby minimizing the chance of absorber material being introduced into the reactor coolant system. Therefore the proposed change will not create a new or different kind of accident.

3. Do the proposed changes involve a significant reduction in a margin of safety?

   Response: No

The revised RCCA FULLY WITHDRAWN definition has an insignificant effect on control rod drop time. The rod drop time will continue to be bounded by that assumed in the UFSAR and required by TS. Prior to each operating cycle the actual rod drop times are required to be confirmed as less than or equal to 2.7 seconds per TS 4.1.3.3. No change is being made to the lowest allowable position; therefore prior assessments regarding minimal rod insertion into the active fuel region remain applicable and unchanged. Consequently, there is no impact on previously analyzed conditions for both axial and radial power distributions, critical boron concentrations and temperature dependent shutdown margins. Therefore, the proposed change does not involve a significant reduction in any safety margin.

Based upon the above, PSEG concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10CFR50.92 (c), and, accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements and Criteria

10CFR50 Appendix A General Design Criteria (GDC):

Criterion 26--Reactivity control system redundancy and capability. Two independent reactivity control systems of different design principles shall be provided. One of the systems shall use control rods, preferably including a positive means for inserting the rods, and shall be capable of reliably controlling reactivity changes to assure that under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified acceptable fuel design limits are not exceeded. The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded. One of the systems shall be capable of holding the reactor core subcritical under cold conditions.

The proposed change to the definition of FULLY WITHDRAWN does not alter conformance with the above criteria.

In conclusion, based on the considerations discussed above, (1) there is a reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the NRC's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact

statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

(1) Letter from NRC to PSEG: "Redefinition of Fully Withdrawn (TAC Nos. 71834/71835), Salem Nuclear Generating Station, Unit Nos. 1 and 2," dated March 22, 1989

ATTACHMENT 2

TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License DPR-70 are affected by this change request:

Technical Specification	Page
Definition 1.13a	1-3
3.1.3.3	3/4 1-21
3.1.3.2.1	3/4 1-19

The following Technical Specifications for Facility Operating License DPR-75 are affected by this change request:

Technical Specification	Page
Definition 1.13a	1-3
3.1.3.3	3/4 1-18
3.1.3.2.1	3/4 1-16

$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY

1.11 $\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half-lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

ENGINEERED SAFETY FEATURE RESPONSE TIME

1.12 The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

FREQUENCY NOTATION

1.13 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

FULLY WITHDRAWN

1.13a FULLY WITHDRAWN shall be the condition where control and/or shutdown banks are at a position which is within the interval of 222 to ~~228~~ 230 steps withdrawn, inclusive. FULLY WITHDRAWN will be specified in the current reload analysis.

GASEOUS RADWASTE TREATMENT SYSTEM

1.14 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

IDENTIFIED LEAKAGE

1.15 IDENTIFIED LEAKAGE shall be:

a. Leakage (except Reactor Coolant Pump Seal Water Injection) into closed systems, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.3 The individual full length (shutdown and control) rod drop time from ~~228~~ 230 steps withdrawn shall be ~~≤~~ less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

a. T_{avg} ≥ greater than or equal to 541°F, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODE 1 & 2.

ACTION:

a. With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.

b. With the rod drop times within limits but determined with 3 reactor coolant pumps operating, operation may proceed provided THERMAL POWER is restricted to ≤71% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.1.3.3 The rod drop time of full length rods shall be demonstrated through measurement prior to reactor criticality:

a. For all rods following each removal of the reactor vessel head,

b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and

c. At least once per 18 months.

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2.1 The shutdown and control rod position indication systems shall be OPERABLE and capable of determining the actual and demanded rod positions as follows:

a. Analog rod position indicators, within one hour after rod motion (allowance for thermal soak);

All Shutdown Banks: ±18 steps at ≤ 85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-~~228~~ 230 steps.

Control Rank A: ±18 steps at ≤ 85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-~~228~~ 230 steps.

Control Bank B: ±18 steps at ≤ 85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 160-~~228~~ 230 steps.

Control Bank C and D: ±18 steps at ≤ 85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-~~228~~ 230 steps.

b. Group demand counters; ± 2 steps of the pulsed output of the Slave Cycler Circuit over the withdrawal range of 0-~~228~~ 230 steps.

APPLICABILITY: MODES 1 and 2.
ACTION:

a. With a maximum of one analog rod position indicator per bank inoperable either:

1. Determine the position of the non-indicating rod(s) indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% RTP or the power distribution monitoring system is inoperable) at least once per 8 hours* and within one hour after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

* During Cycle 14, the position of Rod 1SB2 will be determined indirectly by the movable incore detectors within 8 hours following its movement until the repair of the indication system for this rod. During reactor startup, the fully withdrawn position of Rod 1SB2 will be determined by current traces and subsequently verified by the movable incore detectors prior to entry into Mode 1.

b. With two or more analog rod position indicators per bank inoperable, within one hour restore the inoperable rod position indicator(s) to OPERABLE status or be in HOT STANDBY within the next 6 hours. A maximum of one rod position indicator per bank may remain inoperable following the hour, with Action (a) above being applicable from the original entry time into the LCO.

E - AVERAGE DISINTEGRATION ENERGY

1.11 $\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half-lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

ENGINEERED SAFETY FEATURE RESPONSE TIME

1.12 The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

FREQUENCY NOTATION

1.13 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

FULLY WITHDRAWN

1.13a FULLY WITHDRAWN shall be the condition where control and/or shutdown banks are at a position which is within the interval of 222 to ~~228~~ 230 steps withdrawn, inclusive. FULLY WITHDRAWN will be ~~established by~~ specified in the current reload analysis.

GASEOUS RADWASTE TREATMENT SYSTEM

1.14 A GASEOUS RADWASTE TREATMENT SYSTEM is any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

IDENTIFIED LEAKAGE

1.15 IDENTIFIED LEAKAGE shall be:

a. Leakage (except Reactor Coolant Pump Seal Water Injection) into closed systems, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.3 The individual full length (shutdown and control) rod drop time from ~~228~~ 230 steps withdrawn shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

a. T_{avg} greater than or equal to 541°F, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 & 2.

ACTION:

a. With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.

b. With the rod drop times within limits but determined with 3 reactor coolant pumps operating, operation may proceed provided THERMAL POWER is restricted to less than or equal to 76% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.1.3.3 The rod drop time of full length rods shall be demonstrated through measurement prior to reactor criticality:

a. For all rods following each removal of the reactor vessel head,

b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and

c. At least once per 18 months.

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2.1 The shutdown and control rod position indication systems shall be OPERABLE and capable of determining the actual and demanded rod positions as follows:

a. Analog rod position indicators, within one hour after rod motion (allowance for thermal soak);

All Shutdown Banks: ± 18 steps at ≤85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-~~228~~ 230 steps.

Control Bank A: ± 18 steps at ≤85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-~~228~~ 230 steps.

Control Bank B: ± 18 steps at ≤85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal ranges of 0-30 steps and 160-~~228~~ 230 steps.

Control Banks C and D: ± 18 steps at ≤85% reactor power or if reactor power is > 85% RATED THERMAL POWER ± 12 steps of the group demand counters for withdrawal range of 0-~~228~~ 230 steps.

b. Group demand counters; ± 2 steps of the pulsed output of the Slave Cycler Circuit over the withdrawal range of 0-~~228~~ 230 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With a maximum of one analog rod position indicator per bank inoperable either:

1. Determine the position of the non-indicating rod(s) indirectly using the power distribution monitoring system (if power is above 25% RTP) or using the movable incore detectors (if power is less than 25% RTP or the power distribution monitoring system is inoperable) at least once per 8 hours and within one hour after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

b. With two or more analog rod position indicators per bank inoperable, within one hour restore the inoperable rod position indicator(s) to OPERABLE status or be in HOT STANDBY within the next 6 hours. A maximum of one rod position indicator per bank may remain inoperable following the hour, with Action (a) above being applicable from the original entry time into the LCO.

ATTACHMENT 3 (Information Only)

TECHNICAL SPECIFICATION BASES PAGES WITH PROPOSED CHANGES

The following Technical Specification Bases for Facility Operating License DPR-70 are affected by this change request:

Technical Specification	Page
B 3/4 1.3	B 3/4 1-4

The following Technical Specification Bases for Facility Operating License DPR-75 are affected by this change request:

Technical Specification	Page
B 3/4 1.3	B 3/4 1-4

The boron capability required below 200 °F in sufficient to provide a SHUTDOWN MARGIN of 1% delta k/k after xenon decay and cooldown from 200 °F to 140 °F. This condition requires either 2,600 gallons of 6,560 ppm borated water from the boric acid storage tanks or 7,100 gallons of 2,300 ppm borated water from the refueling water storage tank.

The 37,000 gallons limit in the refueling water storage tank for Modes 5 and 6 is based upon 21,210 gallons that is undetectable due to lower tap location, 8,550 gallons for instrument error, 7,100 gallons required for shutdown margin, and an additional 140 gallons due to rounding up.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 10.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of rod mis-alignment on associated accident analyses. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. OPERABLE condition for the analog rod position indicators is defined as being capable of indicating rod position to within the allowed rod misalignment relative to the bank demand position for a range of positions. For the Shutdown Banks and Control Bank A this range is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 200 and ~~228~~ 230 steps withdrawn inclusive. This permits the operator to verify that the control rods in these banks are either fully withdrawn or fully inserted, the normal operating modes for these banks. Knowledge of these banks' positions in these ranges satisfies all accident analysis assumptions concerning their position. The range for Control Bank B is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 160 and ~~228~~ 230 steps withdrawn inclusive. For Control Banks C and D the range is defined as the group demand counter indicated position between 0 and ~~228~~ 230 steps, withdrawn. Comparison of the group demand counters to the bank insertion limits with verification of rod position with the analog rod position indicators (after thermal soak after rod motion) is sufficient verification that the control rods are above the insertion limits. The full out position will be ~~specifically established for each cycle by~~ specified in the ~~R~~reload ~~Safety~~ ~~A~~analysis for the cycle. This position will be within the band established by FULLY WITHDRAWN and will be administratively controlled. This band is allowable to minimize RCCA wear, ~~pursuant to~~ consistent with Information Notice 87-19 and RCCA examinations that were conducted during Salem Unit 1 Fall outage 2005 (1R17) by the Salem RCCA vendor AREVA NP. (Refer to LAR S09-01).

The boron capability required below 200 °F is sufficient to provide a SHUTDOWN MARGIN of 1% delta k/k after xenon decay and cooldown from 200 °F to 140 °F. This condition requires either 2,600 gallons of 6,560 ppm borated water from the boric acid storage tanks or 7,100 gallons of 2,300 ppm borated water from the refueling water storage tank.

The 37,000 gallons limit in the refueling water storage tank for Modes 5 and 6 is based upon 21,210 gallons that is undetectable due to lower tap location, 8,550 gallons for instrument error, 7,100 gallons required for shutdown margin, and an additional 140 gallons due to rounding up.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 10.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of rod mis-alignment on associated accident analyses. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. OPERABLE condition for the analog rod position indicators is defined as being capable of indicating rod position to within the allowed rod misalignment relative to the bank demand position for a range of positions. For the Shutdown Banks and Control Bank A this range is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 200 and ~~228~~ 230 steps withdrawn inclusive. This permits the operator to verify that the control rods in these banks are either fully withdrawn or fully inserted, the normal operating modes for these banks. Knowledge of these banks' positions in these ranges satisfies all accident analysis assumptions concerning their position. The range for Control Bank B is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 160 and ~~228~~ 230 steps withdrawn inclusive. For Control Banks C and D the range is defined as the group demand counter indicated position between 0 and ~~228~~ 230 steps withdrawn. Comparison of the group demand counters to the bank insertion limits with verification of rod position with the analog rod position indicators (after thermal soak after rod motion) is sufficient verification that the control rods are above the insertion limits. The full out position will be ~~specifically established for each cycle by~~ specified in the ~~R~~reload ~~Safety~~ ~~A~~analysis for the cycle. This position will be within the band established by FULLY WITHDRAWN and will be administratively controlled. This band is allowable to minimize RCCA wear, ~~pursuant to~~ consistent with Information Notice 87-19 and RCCA examinations that were conducted during Salem Unit 2 Spring outage 2008 (2R16) by the Salem RCCA vendor AREVA NP (Refer to LAR S09-01).