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**Nuclear Business Unit**

**MAY 3 2000**

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United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Gentlemen:

**EXIGENT REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS  
POSITION INDICATION REQUIREMENTS  
SALEM GENERATING STATION  
FACILITY OPERATING LICENSE DPR-70  
DOCKET NO. 50-272**

In accordance with 10CFR50.90 and 10CFR50.91(a)(6), Public Service Electric & Gas (PSE&G) Company hereby requests exigent approval of changes to the Salem Generating Station Unit 1 Technical Specifications (TS). In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

The indication system for Control Rod 1SB2 (Shutdown Bank B) became inoperable on April 28, 2000. The position indication system was indicating that the rod was fully inserted; however, the rod was confirmed to be in the fully withdrawn position based on flux mapping information from the movable incore detectors. Troubleshooting has resulted in a determination that the position indication system cannot be repaired with the reactor at power and that the possibility exists that repairs cannot be made until Mode 5. Personnel safety and ALARA concerns prevent the safe completion of repairs at power. In the area where the repairs are needed, the dose rate is high (approximately 600 to 2400 mr/hour neutron, 200 mr/hour gamma), the temperature is high (approximately 135°F), the lighting is poor, the clearance is tight (approximately 20 inch clearance), and the work location is 30 feet in the air with no railing. The repair activities are estimated to take one hour (this exceeds the 15 minute stay time permitted for this environment). In Mode 3, the dose rates are lower (100 mr/hour gamma, 0 mr/hour neutron).

With one analog rod position indicator inoperable, the TS currently require that either (1) the position of the non-indicating rod be determined indirectly by the movable incore detectors once per 8 hours and within one hour of any motion that exceeds 24 steps or (2) thermal power be reduced to less than 50% within 8 hours. PSE&G is currently

The power is in your hands.

*ADD*

implementing Option (1). Implementation of the request contained in this submittal will allow an extension of the time to determine the position of Rod 1SB2 from once per 8 hours to within 8 hours following any movement of the rod until repair of the indication system is completed. Surveillance Requirements 4.1.3.1.1 and 4.1.3.4 are also modified to require that the position of Rod 1SB2 be determined only following movement of the rod (within 8 hours of movement) until repair of the indication system is completed. During startup, the changes allow the fully withdrawn position to be determined by stationary gripper coil traces or other equivalent means; and subsequently verified by the movable incore detectors prior to entry into Mode 1.

The failure was unexpected and has resulted in a significant burden on PSE&G personnel and the movable incore detectors. Operation of the Unit 1 flux mapping system 120 times per month to comply with compensatory actions required by TS may have detrimental effects on the incore system. The incore system was not designed to operate in this manner. If the incore system is operated in this manner for the remainder of the Unit 1 Cycle 14, an incore system malfunction is expected to result and a significant incore system malfunction may result due to increased wear and tear on the system. A significant incore system malfunction may challenge the ability to perform other TS surveillances for which the incore system is used.

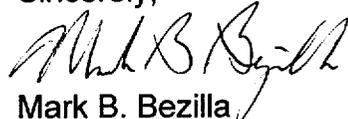
Based on the recent and unexpected nature of the failure and the significant burden caused by the current requirement, PSE&G is requesting approval of this request on an exigent basis in accordance with 10CFR50.91(a)(6).

The proposed changes have been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and a determination has been made that this request involves no significant hazards considerations. The basis for the requested change is provided in Attachment 1 to this letter. A 10CFR50.92 evaluation, with a determination of no significant hazards consideration, is provided in Attachment 2. The marked up TS pages affected by the proposed changes are provided in Attachment 3.

Upon NRC approval of the proposed changes, PSE&G requests that the amendment be made effective on the date of issuance.

Should you have any questions regarding this request, please contact Mr. C. E. Manges, Jr. at 856-339-3234.

Sincerely,



Mark B. Bezilla  
Vice President - Operations

Affidavit

Attachments (3)

C Mr. H. Miller, Administrator - Region I

**MAY 3 2000**

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**ATTACHMENT 1  
SALEM GENERATING STATION  
FACILITY OPERATING LICENSES DPR-70 AND DPR-75  
DOCKET NOS. 50-272 AND 50-311  
REVISIONS TO SALEM TS**

**BASIS FOR REQUESTED CHANGE:**

Public Service Electric and Gas Company (PSE&G) requests that Salem Unit 1 Technical Specification (TS) 3.1.3.2.1, Action a.1 be modified to allow an extension of the time to determine the position of Rod 1SB2 from once per 8 hours to within 8 hours following any movement of the rod until repair of the indication system is completed. Surveillance Requirements 4.1.3.1.1 and 4.1.3.4 are also modified to require that the position of Rod 1SB2 be determined only following movement of the rod (within 8 hours of movement) until repair of the indication system is completed. During startup, the changes allow the fully withdrawn position to be determined by stationary gripper coil traces or other equivalent means; and subsequently verified by the movable incore detectors prior to entry into Mode 1. The proposed change provides adequate controls to ensure that the rod position is known and to ensure that a rod drop or misalignment is detectable. Since the increase in the likelihood of an undetected rod drop or misalignment is determined to be negligible, the integrity of the accident analysis is maintained. The proposed changes to the TS are indicated on the marked-up TS pages contained in Attachment 3 of this submittal.

**REQUESTED CHANGE, PURPOSE AND BACKGROUND:**

**Background**

The indication system for Rod 1SB2 (Shutdown Bank B) became inoperable on April 28, 2000. The position indication system was indicating that the rod was fully inserted; however, the rod was confirmed to be in the fully withdrawn position based on flux mapping information from the movable incore detectors. Troubleshooting has resulted in a determination that the position indication system cannot be repaired with the reactor at power and that the possibility exists that repairs cannot be made until Mode 5. With one analog rod position indicator inoperable, the TS currently require that either (1) the position of the non-indicating rod be determined indirectly by the movable incore detectors once per 8 hours and within one hour of any motion that exceeds 24 steps or (2) thermal power be reduced to less than 50% within 8 hours. PSE&G is currently implementing Option (1).

**Requested Change**

An \* is being added to the Salem Generating Station (SGS) Unit 1 TS Surveillance Requirement 4.1.3.1.1 and TS 3.1.3.2.1, Action a.1, and a \*\*\* is being added to Surveillance Requirement 4.1.3.4. The \* and \*\*\* state the following:

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 or other equivalent means, and subsequently verified by the movable incore detectors prior to entry into Mode 1.

Purpose

The proposed change will reduce the burdens on PSE&G personnel and the movable incore detectors that were created by the failure.

**JUSTIFICATION OF REQUESTED CHANGES:**

In evaluating the requested change, the following conditions were considered:

- Rod Drop or Rod Misalignment During Power Operation
- Rod Drop or Rod Misalignment During Reactor Startup
- Reactor Trip

Rod Drop or Rod Misalignment During Power Operation

A full rod drop of Rod 1SB2 would be immediately detectable by means other than the position indication system (i.e., an urgent failure alarm would be annunciated and analysis has shown that a drop of the 1SB2 would cause a noticeable change in core parameters and most likely a reactor trip) and the required operator actions would therefore not be dependent on the status of the individual rod position indication system.

A rod misalignment is also detectable by other means (i.e., an urgent failure alarm) and the required operator actions would therefore not be dependent on the status of the individual rod position indication system.

The increase in the likelihood of an undetected rod drop or misalignment is therefore considered to be negligible.

Rod Drop or Rod Misalignment During Reactor Startup

A full rod drop of Rod 1SB2 would be detectable by means other than the position indication system (i.e., an urgent failure alarm) and the required operator actions would therefore not be dependent on the status of the individual rod position indication.

Since the movable incore detectors cannot be used to determine rod position until sometime after entry into Mode 2 when neutron flux becomes adequate, an alternate method will be utilized to provide initial verification that the rod is fully withdrawn and thereby allow plant startup, if required. This method utilizes stationary gripper coil traces from the coils or other equivalent means and can be used to verify that the rod is fully withdrawn. Verification using this method will permit startup and entry into Mode 2.

As a second, diverse check, the movable incore detectors will be used to verify rod position when neutron flux becomes adequate. Following verification that the rod is

fully withdrawn, a rod misalignment would be detectable by means other than the position indication system (i.e., an urgent failure alarm) and the required operator actions would therefore not be dependent on the status of the individual rod position indication.

The increase in the likelihood of an undetected rod drop or misalignment is therefore considered to be negligible.

#### Reactor Trip

Following a reactor trip, the position indication system is used to verify that all rods have fully inserted. Emergency boration is required if more than one rod fails to fully insert. The inoperability of the position indication system prevents verification of insertion for the subject rod. PSE&G has modified the position indication system to show Rod 1SB2 in the fully withdrawn position. Therefore, PSE&G is conservatively assuming that Rod 1SB2 is not fully inserted and emergency boration would be initiated if one rod other than 1SB2 does not fully insert.

#### **ENVIRONMENTAL IMPACT:**

The proposed TS changes were reviewed against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, a significant increase in the amounts of effluents that may be released offsite, or a significant increase in the individual or cumulative occupational radiation exposures. Based on the foregoing, PSE&G concludes that the proposed TS changes meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

**ATTACHMENT 2  
SALEM GENERATING STATION  
FACILITY OPERATING LICENSES DPR-70 AND DPR-75  
DOCKET NOS. 50-272 AND 50-311  
SIGNIFICANT HAZARDS EVALUATION**

10CFR50.92 EVALUATION

Public Service Electric & Gas has concluded that the proposed changes to the Salem Generating Station Unit 1 Technical Specifications do not involve a significant hazards consideration. In support of this determination, an evaluation of each of the three standards set forth in 10CFR50.92 is provided below.

**REQUESTED CHANGE**

Public Service Electric and Gas Company (PSE&G) requests that Salem Unit 1 Technical Specification (TS) 3.1.3.2.1, Action a.1 be modified to allow an extension of the time to determine the position of Rod 1SB2 from once per 8 hours to within 8 hours following any movement of the rod until repair of the indication system is completed. Surveillance Requirements 4.1.3.1.1 and 4.1.3.4 are also modified to require that the position of Rod 1SB2 be determined only following movement of the rod (within 8 hours of movement) until repair of the indication system is completed. During startup, the changes allow the fully withdrawn position to be determined by stationary gripper coil traces or other equivalent means; and subsequently verified by the movable incore detectors prior to entry into Mode 1.

**BASIS**

1. *The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The proposed change reduces the frequency of verifying the position of one non-indicating rod using the movable incore detectors and allows a different means of verifying rod position during reactor startup. The inoperability of the normal position indicating system does not affect the probability of a rod drop, a rod misalignment, or any other analyzed accident.

The inoperability of the rod position indicator eliminates one means of detecting a rod drop or rod misalignment. Failure to detect a misaligned rod could affect the initial conditions of the accident analysis and thereby affect the consequences. Based upon the other means available for detecting rod drops and misalignment (e.g., the urgent failure alarm), the increase in the likelihood of an undetected rod drop or misalignment is considered to be negligible. As a result, the initial conditions of the accident analysis are preserved and the consequences of previously analyzed accidents are unaffected.

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

*2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The change will not introduce any new accident initiators. The change only allows an extension to the previously approved frequency for verifying rod position for one non-indicating rod and allows a different means of verifying rod position during reactor startup.

Therefore, the change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

*3. The proposed change does not involve a significant reduction in a margin of safety.*

The proposed change reduces the frequency of verifying the position of one non-indicating rod using the movable incore detectors and allows a different means of verifying rod position during reactor startup. The inoperability of the rod position indicator eliminates one means of detecting a rod drop or rod misalignment. Failure to detect a misaligned rod could affect the initial conditions of the accident analysis and thereby affect the associated margins of safety. Based upon the other means available for detecting rod drops and misalignment (e.g., the urgent failure alarm), the increase in the likelihood of an undetected rod drop or misalignment is considered to be negligible. As a result, the initial conditions of the accident analysis are preserved and the margins of safety are unaffected.

Therefore, the change does not involve a significant reduction in a margin of safety

## **CONCLUSION**

Based on the above, PSE&G has determined that the proposed changes do not involve a significant hazards consideration.

**SALEM GENERATING STATION  
FACILITY OPERATING LICENSE DPR-70  
DOCKET NO. 50-272  
REVISIONS TO THE TECHNICAL SPECIFICATIONS (TS)**

TECHNICAL SPECIFICATIONS PAGES WITH PROPOSED CHANGES

The following Technical Specifications pages are affected by this change request:

<u>TS SECTION</u>	<u>PAGE</u>
Surveillance Requirement 4.1.3.1.1	3/4 1-18a
3.1.3.2.1 Action a	3/4 1-19
Surveillance Requirement 4.1.3.4	3/4 1-22

## REACTIVITY CONTROL SYSTEMS

### 3/4.1.3 MOVABLE CONTROL ASSEMBLIES

#### GROUP HEIGHT

#### LIMITING CONDITION FOR OPERATION

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3.1.3.1 All full length (shutdown and control) rods, shall be OPERABLE and positioned within  $\pm 18$  steps (indicated position) when reactor power is  $\leq 85\%$ , RATED THERMAL POWER, or  $\pm 12$  steps (indicated position) when reactor power is  $> 85\%$  RATED THERMAL POWER, of their group step counter demand position within one hour after rod motion.

APPLICABILITY: MODES 1\* and 2\*

#### ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or mis-aligned from the group step counter demand position by more than  $\pm 18$  steps (indicated position) at  $\leq 85\%$  RATED THERMAL POWER or  $\pm 12$  steps (indicated position) at  $> 85\%$  RATED THERMAL POWER, be in HOT STANDBY within 6 hours.
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or mis-aligned from its group step counter demand position by more than  $\pm 18$  steps (indicated position) at  $\leq 85\%$  RATED THERMAL POWER or  $\pm 12$  steps (indicated position) at  $> 85\%$  RATED THERMAL POWER, POWER OPERATION may continue provided that within one hour either:
  1. The rod is restored to OPERABLE status within the above alignment requirements, or
  2. The remainder of the rods in the bank with the inoperable rod are aligned to within  $\pm 18$  steps (indicated position) at  $\leq 85\%$  RATED THERMAL POWER or  $\pm 12$  steps (indicated position) at  $> 85\%$  RATED THERMAL POWER of the inoperable rod while maintaining the rod sequence and insertion limits in the COLR per specification 3.1.3.5. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation, or
  3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

\* See Special Test Exceptions 3.10.2 and 3.10.3.

- a) A reevaluation of each accident analysis of table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions.
- b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.
- c) A power distribution map is obtained from the movable incore detectors and  $F_0(Z)$   $F_{DH}^N$  are verified to be within their limits within 72 hours.
- d) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER. THERMAL POWER shall be maintained less than or equal to 75% of RATED THERMAL POWER until compliance with ACTIONS 3.1.3.1.c.3.a and 3.1.3.1.c.3.c above are demonstrated.

#### SURVEILLANCE REQUIREMENTS

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4.1.3.1.1 The position of each full length rod shall be determined to be within the limits established in the limiting condition for operation at least once per 12 hours (allowing for one hour thermal soak after rod motion) except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.\*

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

\* 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 or other equivalent means, and subsequently verified by the movable incore detectors prior to entry into Mode 1.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

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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:  $\pm 18$  steps at  $\leq 85\%$  reactor power or if reactor power is  $> 85\%$  RATED THERMAL POWER  $\pm 12$  steps of the group demand counters for withdrawal ranges of 0-30 steps and 200-228 steps.

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

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

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

- b. Group demand counters;  $\pm 2$  steps of the pulsed output of the Slave Cyclor Circuit over the withdrawal range of 0-228 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 by the movable incore detectors 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 will be determined by current traces or other equivalent means, 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.

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C. With a maximum of one group demand position indicator per bank inoperable either:

1. Verify that all analog rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of 18 steps when reactor power is  $\leq$  85% RATED THERMAL POWER or if reactor power is  $>$  85% RATED THERMAL POWER, 12 steps of each other at least once per 8 hours, or
2. Reduce THERMAL POWER to less than 50% of RATED POWER within 8 hours.

#### SURVEILLANCE REQUIREMENTS

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4.1.3.2.1.1 Each analog rod position indicator shall be determined to be OPERABLE by verifying that the demand position indication system and the rod position indication system agree within 18 steps when reactor power is  $\leq$  85% RATED THERMAL POWER or if reactor power is  $>$  85% RATED THERMAL POWER, 12 steps (allowing for one hour thermal soak after rod motion) at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indication system at least once per 4 hours.

4.1.3.2.1.2 Each of the above required rod position indicator(s) shall be determined to be OPERABLE by performance of a CHANNEL calibration at least once per 18 months.

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

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3.1.3.4 All shutdown rods shall be FULLY WITHDRAWN.

APPLICABILITY: MODES 1\*, and 2\*#@

ACTION:

With a maximum of one shutdown rod not FULLY WITHDRAWN, except for surveillance testing pursuant to Specification 4.1.3.1.2, within one hour either:

- a. FULLY WITHDRAW the rod, or,
- b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

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4.1.3.4 Each shutdown rod shall be determined to be FULLY WITHDRAWN by use of the group demand counters, and verified by the analog rod position indicators\*\*,\*\*\*:

- a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C, or D during an approach to reactor criticality, and
- b. At least once per 12 hours thereafter.

\* See Special Test Exceptions 3.10.2 and 3.10.3

\*\*For power levels below 50% one hour thermal "soak time" is permitted.

During this soak time, the absolute value of rod motion is limited to six steps.

\*\*\* 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 or other equivalent means and subsequently verified by the movable incore detectors prior to entry into Mode 1.

# With Keff greater than or equal to 1.0

@ Surveillance 4.1.3.4.a is applicable prior to withdrawing control banks in preparation for startup (Mode 2).