PSEG

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038-0236

Nuclear Business Unit

DEC 2 9 1999

LR-N99556
LCR S99-11

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

Gentlemen:

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
REACTOR TRIP SYSTEM INSTRUMENTATION
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

In accordance with the requirements of 10CFR50.90, Public Service Electric & Gas Company (PSE&G) hereby transmits a request for revision to the Technical Specifications (TS) for Salem Generating Station Unit Nos. 1 and 2 respectively. Pursuant to the requirements of 10CFR50.91(b)(1), a copy of this request for amendment has been sent to the State of New Jersey.

The proposed TS changes contained herein modify the requirements stated in the Notes 1 and 2 to Table 2.2-1, Reactor Trip System Instrumentation Setpoints, in order to add a tolerance associated with the setpoint values for the derivative module time constants (the Tau values) of the Over-Power and Over-Temperature delta temperature units.

Approval of this revision request provides necessary clarity to the requirements and is editorial in nature.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and it has been determined that this request involves no significant hazards considerations

PSE&G has reviewed the proposed License Change Request (LCR) against the criteria of 10 CFR 51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, PSE&G concludes that the proposed change meets the criteria

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delineated in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

A description of the requested changes, the reason for the changes, and the justification for the changes are provided in Attachment 1. The basis for no significant hazards consideration determination is provided in Attachment 2. The Technical Specification pages affected by the proposed changes are provided in Attachment 3.

Should you have any questions regarding this request, please contact John Nagle, Licensing, at (856) 339-3171.

Sincerely,

/jcn
Affidavit
Attachments (3)

C Mr. H. J. Miller, Administrator - Region I
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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

M. J. Trum, being duly sworn according to law deposes and says:
I am Vice President - Maintenance of Public Service Electric & Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning the Salem Generating Station, Units Nos. 1 and 2, are true to the best of my knowledge, information and belief.

Subscribed and Sworn to before me
this 29th day of December 1999

Notary Public of New Jersey

My Commission expires on 10/16/2003

SALEM GENERATING STATION
UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSES DPR – 70 AND DRP - 75
DOCKET NOS. 50-272 AND 50-311
CHANGE TO TECHNICAL SPECIFICATIONS

DESCRIPTION OF THE PROPOSED CHANGE

As indicated in Attachment 3 of this submittal, Notes 1 and 2 for Technical Specification Table 2.2-1 are being modified by the addition of a ±10% tolerance for the Tau values given for the time constants, τ_1, τ_2 & τ_3 as shown below :

$\tau_1 + \tau_2$ = Time constants utilized in the lead-lag controller for T_{avg}
τ_1 = 30 sec ± 10%.
τ_2 = 4 sec ± 10%.

τ_3 = Time constant utilized in the rate lag controller for T_{avg}
τ_3 = 10 secs ± 10%.

REASON FOR THE PROPOSED CHANGE

The proposed changes will eliminate a situation in which verbatim compliance of the specification is not possible. Instrumentation, by its very nature, can not be calibrated to exact values without the use of a tolerance. The Salem Units 1 and 2 Technical Specifications were based upon NUREG 0452, Standard Technical Specifications - Westinghouse Pressurized Water Reactors, July 1979. This NUREG utilized "nominal values" for these parameters, consistent with the manner in which Westinghouse performed analyses in support of the licensing of Salem. In WCAP-8745-P-A, "Design Bases for the Thermal Overpower Delta T and Thermal Overtemperature Delta T Trip Functions," the values for the time constants were considered nominal. The uncertainties associated with the gains in the equations were discussed, as they are the critical parameters, and these parameters were accordingly set in a conservative manner. Since the time constants are not critical parameters (i.e., do not significantly impact the derived setpoint), nominal values were used in the analysis, with identical values for time response constants listed in the Technical Specifications.

Because the current Technical Specifications would not allow any deviation from the existing time values, PSEG is proposing to establish a tolerance band for these parameters. Specifically, a 10% tolerance for the various Tau values will be applied consistent with the Salem Analyses.

Although the Standard Technical Specifications - Westinghouse Plants NUREG 1431, Revision 1, dated April 1995, utilizes ranges for these values the change which is proposed herein uses the tolerance band methodology to remain consistent with the plant specific analysis methodology.

JUSTIFICATION FOR THE PROPOSED CHANGES

The Technical Specification Bases contain the following discussion of the Over temperature and Over power delta Temperature Trips:

The Overtemperature Δ T trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transit delays from the core to the temperature detectors (*about 4 seconds*), and pressure is within the range between the High and Low Pressure reactor trips. This setpoint includes corrections for changes in density and heat capacity of water with temperature and dynamic compensation for piping delays from the core to the loop temperature detectors. With normal axial power distribution, this reactor trip limit is always below the core safety limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the reactor trip is automatically reduced according to the notations in Table 2.2-1. (Emphasis added)

The Overpower ΔT reactor trip provides assurance of fuel integrity under all possible overpower conditions, limits the required range for Overtemperature ΔT protection, and provides a backup to the High Neutron Flux trip. The setpoint includes corrections for changes in density and heat capacity of water with temperature, and dynamic compensation for piping delays from the core to the loop temperature detectors. No credit was taken for operation of this trip in the accident analyses; however, its functional capability at the specified trip setting is required by this specification to enhance the overall reliability of the Reactor Protection System.

The proposed changes do not alter the safety related design basis associated with the trip functions.

The proposed changes provide clarification, thus eliminating any potential issues concerning verbatim Technical Specification compliance. Specifically, the changes eliminate ambiguity associated with the use of "nominal values" and assure that the desired setpoint is maintained within the band corresponding to the values which have been assumed in supporting analysis.

The use of nominal values for the time constants in the derivative setpoint of the OTDT and OPDT trip units does not affect the accident analyses. The use of a 10% tolerance band has been reviewed and it has been concluded that "the analyses that model nominal bands are sufficiently conservative and that no further analysis are necessary" (Letter PSE-96-808, W. Frank Knowles, Westinghouse to Tom Ross, PSE&G, Subject: Overtemperature ΔT and Overpower ΔT Lead/Lag). This band is consistent with current calibration allowances and representative of the assumptions in the analyses.

SALEM GENERATING STATION
UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSES DPR – 70 AND DRP - 75
DOCKET NOS. 50-272 AND 50-311
CHANGE TO TECHNICAL SPECIFICATIONS

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Pursuant to 10CFR50.92, PSE&G reviewed the proposed revision to determine whether our request involves a significant hazards consideration. PSE&G has determined that operation of Salem Generating Station, Unit Nos. 1 and 2, in accordance with the proposed changes:

1. *Will not involve a significant increase in the probability or consequences of an accident previously evaluated.*

   The accidents of concern affected by the over temperature or over power delta temperature which have been evaluated are unaffected by the proposed editorial changes thus the changes do not significantly increase the probability or consequences of an accident previously evaluated.

2. *Does not create the possibility of a new or different kind of accident from any accident previously analyzed.*

   The changes proposed are editorial in nature and do not alter physical configuration, replace or modify existing equipment, affect operating practices or create any new or different accident precursors which could impact on the accident analysis. Thus there is no possibility of a new or different kind of accident as a result of the proposed changes.

3. *Does not involve a significant reduction in a margin of safety.*

   No margin of safety will be reduced by the proposed changes The proposed changes do not adversely affect the ability of the trip systems to operate when called upon. Rather, these changes should result in clarity regarding the proper calibration of the trip instrumentation and therefore the margin of safety is preserved for those events in which there is a dependence upon an over temperature or over power delta temperature trip signal.

CONCLUSION

Based on the preceding discussion, PSE&G has concluded that the proposed changes to the Technical Specifications do not involve a significant hazards consideration insofar as the changes: (i) do not involve a significant increase in the probability or consequences of an accident previously evaluated, (ii) do not create the possibility of a new or different kind of accident from any accident previously evaluated, and (iii) do not involve a significant reduction in a margin of safety.

SALEM GENERATING STATION
UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSES DPR – 70 AND DRP - 75
DOCKET NOS. 50-272 AND 50-311
CHANGE TO TECHNICAL SPECIFICATIONS
OVER TEMPERATURE AND OVER POWER DELTA TEMPERATURE

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
Table 2.2-1	2-7, 2-9

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

Technical Specification	Page
Table 2.2-1	2-7, 2-9

The following changes, shown in underlined bold, should be incorporated on the attached marked up pages.

Page 2-7

Note 1

τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg}
τ_1 = 30 secs **±10%**, τ_2 = 4 secs . **±10%**

Page 2-9

Note 2

τ_3 = Time constant utilized in the rate lag controller for T_{avg}
τ_3 = 10 secs **±10%**.

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

NOTE 1: Overtemperature $\Delta T \leq \Delta T_o \left[K_1 - K_2 \frac{1+\tau_1 S}{1+\tau_2 S}(T-T') + K_3(P-P') - f_1(\Delta I)\right]$

where:

ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

T' = Indicated T_{avg} at RATED THERMAL POWER $\leq$ 577.9°F

P = Pressurizer pressure, psig

P' = 2235 psig (indicated RCS nominal operating pressure)

$\frac{1+\tau_1 S}{1+\tau_2 S}$ = The function generated by the lead-lag controller for T_{avg} dynamic compensation

τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg} τ_1 = 30 secs, τ_2 = 4 secs. ±10%

S = Laplace transform operator, Sec^{-1} ±10%

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Note 2: Overpower $\Delta T \leq \Delta T_o [K_4 - K_5 [\frac{\tau_3 S}{1+\tau_3 S}] T - K_6 (T-T") - f_2(\Delta I)]$

where: ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

$T"$ = Indicated T_{avg} at RATED THERMAL POWER ≤ 577.9°F

K_4 = 1.09

K_5 = 0.02/°F for increasing average temperature and 0 for decreasing average temperature

K_6 = 0.00149/°F for $T > T"$; $K_6 = 0$ for $T \leq T"$

$\frac{\tau_3 S}{1+\tau_3 S}$ = The function generated by the rate lag controller for T_{avg} dynamic compensation

τ_3 = Time constant utilized in the rate lag controller for T_{avg} τ_3 = 10 secs. ±10%

S = Laplace transform operator, Sec^{-1}

$f_2(\Delta I)$ = 0 for all ΔI

Note 3: The channel's maximum trip point shall not exceed its computed trip point by more than 1.1 percent.

Note 4: The channel's maximum trip point shall not exceed its computed trip point by more than 2.1 percent.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

NOTE 2: Overpower: $\Delta T \leq \Delta T_o \left[K_4 - K_5 \left[\frac{\tau_3 S}{1+\tau_3 S}\right] T - K_6 (T-T") - f_2(\Delta I)\right]$

where:

ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

$T"$ = Indicated T_{avg} at RATED THERMAL POWER ≤ 577.9°F

K_4 = 1.09

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

NOTE 1: Overtemperature $\Delta T \leq \Delta T_o \left[K_1 - K_2\left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)(T-T') + K_3(P-P') - f_1(\Delta I)\right]$

where:
- ΔT_o = Indicated ΔT at RATED THERMAL POWER
- T = Average temperature, °F
- T' = Indicated T_{avg} at RATED THERMAL POWER $\leq$ 577.9°F
- P = Pressurizer pressure, psig
- P' = 2235 psig (indicated RCS nominal operating pressure)
- $\frac{1+\tau_1 S}{1+\tau_2 S}$ = The function generated by the lead-lag controller for T_{avg} dynamic compensation
- τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg} τ_1 = 30 secs, τ_2 = 4 secs. ± 10%
- S = Laplace transform operator

± 10%

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

NOTE 2: Overpower: $\Delta T \leq \Delta T_o \left[K_4 - K_5 \left[\frac{\tau_3 S}{1+\tau_3 S}\right] T - K_6 (T-T") - f_2(\Delta I)\right]$

where:

ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

$T"$ = Indicated T_{avg} at RATED THERMAL POWER ≤ 577.9°F

K_4 = 1.09

K_5 = 0.02/°F for increasing average temperature and 0 for decreasing average temperature

K_6 = 0.00149/°F for $T > T"$; K_6 = 0 for $T \leq T"$

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