PSEG

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

Nuclear Business Unit

JUL 7 2000

LRN-00-0257
LCR S99-11

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

Gentlemen:

REQUEST FOR ADDITIONAL INFORMATION
LICENSEE CHANGE REQUEST S99-11
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

On December 29, 1999, Public Service Electric and Gas Company (PSE&G) submitted a request for amendment to Facility Operating License DPR 70 and 75, for the Salem Nuclear Generating Station, Units 1 and 2. The proposed TS changes contained therein 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.

During a June 2, 2000 telephone conversation with R. Fretz, USNRC Project Manager for Salem, Mr. Fretz requested that PSEG provide a copy of Westinghouse letter PSE-96-808 (Knowles, Westinghouse to Ross, PSEG, dated 12/13/1996). The requested letter was referenced in the above cited License Change Request.

The requested letter was originally classified as "Proprietary" by Westinghouse. As indicated in the attached letter, PSE-00-030 (Osbourne, Westinghouse, to Nagle, PSEG, dated June 21, 2000) the letter has been released from this status.

A001

The enclosed information has been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and PSE&G has made the determination that this information does not alter the no significant hazards considerations determination of the original License Change Request.

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

Sincerely,

David F. Garchow
Vice President-Technical Support

JCN
Attachments (2)

C Mr. H. J. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Fretz, Licensing Project Manager - Salem
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 04D3
Rockville, MD 20852

Mr. S. Morris (X24)
USNRC Senior Resident Inspector

Mr. K. Tosch, Manager IV
Bureau of Nuclear Engineering
P. O. Box 415
Trenton, NJ 08625

REF: LR-N-00-0257
LCR S99-11

STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

D. F. Garchow, being duly sworn according to law deposes and says:
I am Vice President - Technical Support for the 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 7th day of July, 2000

Jennifer M. Turner
Notary Public of New Jersey

My Commission expires on July 25, 2005

Westinghouse
Electric Company LLC

PSE-00-030

P.O Box 355
Pittsburgh Pennsylvania 15230-0355

June 21, 2000

Mr. John Nagle
PSEG
P. O. Box 236
Hancocks Bridge, NJ 08038

PSEG
Salem Unit 1 & 2
Release of Proprietary Letter PSE-96-808

Reference: (1) PSE&G Purchase Order B3-0844436 Release 33, W GO NA 43876
(2) PSE-96-808, OTDT and OPDT Lead/Lag

Dear Mr. Nagle,

Per our telecon of a couple weeks ago, Westinghouse has reviewed your request for release of the referenced letter as part of licensing activities currently ongoing between PSEG and the NRC. Although this information was proprietary in 1996 when it was originally provided to PSEG, subsequent licensing activities between Westinghouse and other customers have resulted in release of this information. Therefore, we no longer consider PSE-96-808 to be proprietary, and you may release it to the NRC without an affidavit. You may use this letter as reference.

Please contact Carl Schwartz on (412) 374-3678 or me on (412) 374-4587 if you have any questions relative to this information.

Very truly yours,

WESTINGHOUSE ELECTRIC COMPANY

M. P. Osborne
Customer Projects Manager

cc: Tom Ross, PSEG

Cc:
Carl Schwartz, W-ECE 5-6
Melita Osborne, W-ECE 5-6
Chris McHugh
Terry Williams
PSE letter file

~~MANAGER~~ NUCLEAR FUEL

NFSI 97-058

FEB 14 '97

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ATTACHMENTS FILED

REPLY BY RETURN

SUSPENSE FILE

Westinghouse Electric Corporation

Suite 4
567 Salem Quinton Road
Salem New Jersey 08079
(609) 935 2945
Fax (609) 935 4238

PSE-96-808
December 13, 1996
RFQ# 9610118
CO# NA 43876
PO# B3-0844436, REL 33

Mr. Tom Ross, Nuclear Fuels Supervisor
Public Service Electric & Gas Company
P.O. Box 236, MC N20
Hancock's Bridge, NJ 08038

Subject: Overtemperature ΔT and Overpower ΔT Lead/Lag

Dear Mr. Ross,

Westinghouse was contracted per the referenced purchase order to perform Overtemperature DT and Overpower DT Lead/Lag settings for prior and current operations. Attached please find the discussion of the acceptability of the OTDT and OPDT lead/lag settings. This letter was requested by PSE&G to provide clarification on the uncertainties associated with the instrumentation for the dynamic compensation terms.

PROPRIETARY STATEMENT

This offer and any subsequent communications relative to this offer are considered to be the proprietary information of Westinghouse Electric Corporation. Accordingly, do not publish, use, reproduce, transmit, or disclose to others outside your organization any information contained in this offer without the prior written consent of Westinghouse.

If you have any questions, please call John DeBlasio at 412-374-5741, or me at 609-935-2945.

Very truly yours,

W. Frank Knowles
WS

W. Frank Knowles
Area Manager
North America Field Sales

Attachment

cc: Glenn Schwartz, MC N20
Jim Shank, MC N47

Introduction

PSE&G has recently contacted Westinghouse with questions on the uncertainties associated with instrumentation for the dynamic compensation terms that are included in the Overtemperature DT (OTDT) and Overpower DT (OPDT) reactor trip functions. Specifically, the dynamic compensation terms in question are the lead/lag on OTDT and the rate lag on OPDT. The Technical Specifications give the same values that were input in the safety analyses. The Salem Technical Specifications do not include inequalities. The OTDT and OPDT hardware at Salem make it impossible to exactly input the Technical Specification values (per the functional requirements the hardware for the time constants is adjustable in increments such that any setpoint can be obtained within ±10%). Thus, the settings at the plant have historically been set as close to the required values as is possible and within ±10%.

The purpose of this document is to explain the bases of the dynamic compensation settings assumed in the safety analyses and to provide a discussion of the acceptability of settings for prior and current practices. Also provided are recommendations for how the dynamic compensation terms could be set in the future to avoid any reoccurrence of related questions. This document deals primarily with the lead/lag on OTDT and the rate lag on OPDT but is equally applicable to other dynamically compensated protective functions at Salem (e.g., low steam pressure).

Background Information

Currently, the lead and lag on the OTDT function and the rate lag on OPDT function at Salem as given in the Technical Specifications are:

Lead (t_1) = 30 seconds Lag (t_2) = 4 seconds Rate lag (t_3) = 10 seconds

The OTDT and OPDT setpoint equations are given later in this document.

When these time constants are assumed in the safety analyses, the values modeled are the nominal values given above. The safety analysis values assumed for actuation setpoints are different from the Technical Specification actuation setpoints by an amount sufficient to cover the calculated static uncertainties and bounding time response values, but the safety analysis and Technical Specification values for time response constants are identical.

Compounding the question is the hardware used to set these values at Salem. The hardware will not allow an exact value to be set and thus, the values at Salem have always been set as close to the Technical Specification values as possible without necessarily being in the conservative direction with respect to the safety analyses. The hardware is designed to allow the settings to be set within ±10% of a desired value.

Westinghouse Position

In non-LOCA safety analyses, most parameters are set to their nominal values. Selected key parameters which are determined to be important to the analysis results are identified and the values used in the analyses for these parameters are set in a conservative fashion to demonstrate that the applicable safety criteria are met. It is Westinghouse's position that this method yields a sufficiently conservative licensing basis and it is not necessary to be conservative for every parameter in every licensing basis analysis. As such, it is concluded that the analyses that model nominal values for the dynamic compensation terms at Salem are sufficiently conservative and that no additional analyses need to be performed.

If a more conservative position is desired, Westinghouse has provided guidance in the following areas in support of customer requests. One utility asked Westinghouse to identify the direction of conservatism for each of the constants associated with the OTDT and OPDT setpoint equations. They used this information to revise their procedures to ensure that the settings at the plant are conservative with respect to the nominal values assumed in the analyses. Associated with this, a change to the Technical Specifications was proposed to replace the equalities with inequalities to specifically allow these settings to be set in a conservative fashion. The conservative direction for each of the terms in the OTDT and OPDT setpoint equations are as follows:

$$OTDT \text{ £ } DT_o\,[K_1 - K_2 * (1+t_1s)/(1+t_2s) * (T - T') + K_3 * (P - P') - f_1(DI)]$$

$$OPDT \text{ £ } DT_o\,[K_4 - K_5 * (t_3s)/(1+t_3s) * T - K_6 * (T - T'') - f_2(DI)]$$

K_1	≤	Identified Value*	K_2	≥	Identified Value*	K_3	≥	Identified Value*
K_4	≤	Identified Value*	K_5	≥	Identified Value*	K_6	≥	Identified Value*
τ_1	≥	Identified Value*	τ_2	≤	Identified Value*	τ_3	≥	Identified Value*
DT_o	≤	Indicated Value**	T'	≤	Identified Value*,**	P'	≥	Identified Value*
T''	≤	Indicated Value**						

* Value explicitly noted in Table 2.2-1 of Technical Specifications

** Normalization to the loop specific as found or indicated value as per ESBU -TB-9607-R1 is strongly recommended.

The scaling of the OPDT and OTDT terms requires gain and bias distributions that involves combining the gains (K_1, K_2,K_3,K_4 ,K_5,K_6) and the constant terms T', P' and T".

Note that, although a "direction of conservatism" is identified for OTDT reactor trip function K_2 and K_3 gains, the gains should be set as close as possible to the value contained in the Technical Specifications to ensure that the OTDT setpoint is consistent with the safety analyses.

A second utility requested reanalysis with a 5% uncertainty band assumed around each dynamic compensation term. Obviously, this resulted in a slight loss in DNBR margin.

Recommendation for Future Consideration

Given the increasing interest in confirming a clear design and operating basis for all safety and licensing analyses, Westinghouse recommends consideration of the NUREG-1431 Technical Specification format with inequalities and a procedural implementation which assures a conservative setting to prevent any further reoccurrence for the need to address this question.

Conclusion

The safety analyses assume nominal values for all time constants included in the licensing basis analyses. Uncertainties are applied to actuation setpoints and other key parameters in the safety analyses with the uncertainties applied in the most conservative direction. This methodology results in a conservative analysis. The safety analyses should continue to assume nominal dynamic compensation values, the Technical Specifications should reflect nominal values with the equalities replaced with the appropriate inequalities and the dynamic compensation terms should be set at the plant on the conservative side of the nominal values to ensure that the Technical Specifications are met considering drift and other allowances as deemed necessary.

The safety analyses performed in support of Salem are consistent with the methods discussed above and, thus, conservatively demonstrate that all applicable acceptance criteria are met. The results and conclusions presented in the Salem UFSAR remain applicable.