SEABROOK STATION
Engineering Office

PSNH

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Public Service of New Hampshire

SBN- 1090
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NEW HAMPSHIRE YANKEE DIVISION

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. Vincent S. Noonan, Project Director
PWR Project Directorate No. 5

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) PSNH Letter (SBN-998), dated April 10, 1986, "Response to Environmental Qualification Audit Observation", J. DeVincentis to V. S. Noonan

Subject: Steam Line Break Evaluation

Dear Sir:

The following response is provided to address additional Staff concerns with respect to potential superheated steam conditions resulting from a mainsteam line break outside of containment (mainsteam/feedwater pipe chase) and is intended to supplement the information provided in Reference (b).

The Seabrook FSAR Chapter 15 steam line break analysis is based upon a minimum assumed shutdown margin of 1.3% and is performed at conditions representative of end of life. The Westinghouse steam line break topical (WCAP-9226) Rev. 1 provides sensitivity studies as a function of the moderator coefficient for the steam line break event which demonstrates that as the temperature coefficient becomes less negative, the accident becomes much less limiting. Since at BOL the temperature coefficient is less negative, the BOL case is significantly less limiting than the point at which the analyses are performed. The amount of reactivity added by the consequential opening of the MSIVs is very small and would have a negligible impact on the BOL transient as compared to the FSAR (EOL) transient. Based upon this, it is Westinghouse's conclusion that the DNB design basis for the plant would be maintained at BOL assuming a shutdown margin of 1.3% as stated in the Technical Specifications.

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At end of life, the consequential opening of the MSIVs could potentially result in a transient more severe than the FSAR due to the slightly increased cooldown. However, the Seabrook Cycle 1 nuclear design calculated shutdown margin at EOL is greater than 3.8%. This value includes the assumption that all rods are fully inserted except for the stuck rod. WCAP-9226 presents the results of sensitivity studies which show that the transient is less limiting as the initial shutdown margin increases. Representative calculations incorporating consequential MSIV failures due to superheated steam show that the amount of r ctivity added by the consequential opening of the MSIVs is negligible when compared to the negative reactivity available by the inclusion of the Cycle 1 shutdown margin of greater than 3.8% in the analysis. Therefore, the DNB design basis would be met at EOL when credit is taken for Cycle 1 specific value of shutdown margin.

The Technical Specifications for shutdown margin will be modified to require 3.8% Δ /k in Operational Modes 1, 2, and 3. We are conducting an ana to verify that 1.3% Δ k/k is sufficient to assure the fuel desi asis is met for End-of-Cycle conditions during a steam line break. U n completion of the analysis and subsequent NRC approval we will request a Technical Specification revision to return to the 1.3% Δ k/k requirement.

The MSIVs and other electrical equipment needed to function in the post-accident environment before superheated steam is released to the pipe chase will perform their intended safety function.

We have also evaluated all electrical equipment in the faulted pipe chase and have determined that its consequential failure could not impact the ability to shutdown with equipment in the other pipe chase.

In response to the effects of offsite radiation doses with a two steam generator blowdown we have performed a comparison of the results presented by Duke. The following conclusions were determined.

The results and assumptions used to evaluate the radiological consequences of the MSLB for the Seabrook Station (FSAR Chapter, Section 15.1.5.3) have been reviewed in an effort to evaluate the potential results of a two steam generator blowdown scenario versus the single steam generator blowdown FSAR analyses. In addition, the assumptions used in the Seabrook analyses have been compared to both the McGuire and Catawba evaluations of the MSLB for both one and two steam generators blowing down as a result of the MSLB. The analyses for all three sites were performed per the governing Standard Review Plan (SRP 15.1.5 Appendix A, Radiological Consequences of Main Steam Line Failures Outside Containment of a PWR) and predictably use identical assumptions with the exception of the site specific parameters, which are:

a) Mass of steam released from faulted and intact steam generators during the 8-hour evaluation time

b) Site specific Accident Atmospheric Dispersion factors (X/Qs)

The dose results for both the Catawba and McGuire Sites for the 2 S.G. blowdown cases are calculated to be well within the exposure guideline values set forth in 10CFR Part 100, Section II. Since both site specific parameters (above) for the Seabrook Station are less than the similar parameters used for the Catawba and McGuire analyses, it is apparent that a similar Seabrook analyses would also yield results which would be well within the 10CFR, Part 100 guideline values. The above conclusions are based on the overall assumption that the effects on the primary side are similar to those predicted for the FSAR 1 S.G. blowdown case (i.e., no fuel damage as a result of the transient).

In conclusion, this response demonstrates that the postulated consequential failure of 2 MSIVs to be acceptable for the first cycle of operation. Prior to startup, following the first refueling, we will have completed the analysis supporting the position that the consequences of this accident are acceptable for the life of the plant. Plant modifications will be performed, if necessary, to assure acceptance criteria for the accident are met. Possible modifications include relocating the affected equipment to a mild environment.

Very truly yours,

John DeVincentis
Director of Engineering

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