PSE&G

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Nuclear Business Unit

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

Gentlemen:

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
ASME CODE SECTION XI
ANALYTICAL EVALUATION OF WALL THINNING
ALTERNATIVE TO REQUIREMENTS OF ASME SECTION XI
HOPE CREEK AND SALEM GENERATING STATIONS
DOCKET NOs. 50-354, 50-272, AND 50-311
TAC NOS. MA8600, MA8601 AND MA8595

On March 17, 2000, Public Service Electric and Gas Company (PSE&G) requested the Nuclear Regulatory Commission (NRC) to approve the use of an alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI (IWA-4000) regarding the evaluation of a component where the section thickness has been reduced below minimum design thickness.

On June 15, 2000, a teleconference was conducted between PSE&G and NRC personnel to discuss a number of questions posed by the NRC. In the attachment to this letter, PSE&G documents its response to the NRC staff. The NRC's questions are re-stated in boldface type followed by the PSE&G response in regular (non-boldface) type.

Should you have any questions or comments on this transmittal, please do not hesitate to contact E. H. Villar at (856) 339-5456.

Sincerely,

Dave Garchow

Dave Garchow
Vice President
Technical Support

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EHV/

BC

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Microfilm Copy
Files Nos. 1.2.1 (Salem), 5.10

ATTACHMENT 1
Response To Request For Additional Information
ASME Code Section XI
Analytical Evaluation Of Wall Thinning
Alternative To Requirements Of ASME Section XI
Hope Creek and Salem Generating Stations

Background.

On March 17, 2000, Public Service Electric and Gas Company (PSE&G) requested the Nuclear Regulatory Commission (NRC) to approve the use of an alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI (IWA-4000) regarding the evaluation of a component where the section thickness has been reduced below minimum design thickness. PSE&G requested that Code Case N-597 be approved for all three facilities (Salem Unit Nos 1 and 2, and Hope Creek), but indicated that Code Case N-597 may be implemented initially at Salem Unit 2.

An example of how PSE&G would apply the Code Case is discussed below, however, PSE&G does not intend to request prior review or approval relative to future applications of Code Case N-597, once the NRC approves the Code Case.

PSE&G intends to apply this Code Case, if necessary, for the 14" feed water elbows. These elbows are on an ASME III, Class 2 line.

Presently, all the elbows meet or exceed the minimum wall thickness of the original design requirements; however two of these elbows in the feed water system are expected to reach minimum wall thickness during Cycle 12. This expectation is based on detailed calculation in accordance with the requirements contained in PSE&G's SC.DE-AP.ZZ-0055(Q), Rev.3, "Detailed Procedure For The Flow Accelerated Corrosion Monitoring Program At Salem Nuclear Generating Station Units 1 and 2."

The measured wall thickness for the 21 Steam Generator elbow at 2R10 was:

0.594" in the counterbore region
0.610" in the general elbow region

The measured wall thickness for the 23 Steam Generator elbow at 2R10 was:

0.604" in the counterbore region
0.647" in the general elbow region

The nominal wall thickness of the pipe (Tnom) is 0.750; and the code minimum acceptable wall thickness (Tmin) is 0.518.

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1) **By what means have you determined that two of the elbows will reach minimum wall thickness during Cycle 12? Provide detailed information regarding the basis for determining wall-thinning rates to support this prediction.**

Detailed evaluations were performed using standard industry techniques, which are incorporated in SC.DE-AP.ZZ-0055(Q), Rev.3, "Detailed Procedure For The Flow Accelerated Corrosion Monitoring Program At Salem Nuclear Generating Station Units 1 and 2." This procedure provides detailed requirements in calculating wear rates, remaining life, and predicting remaining wall thickness.

Specifically, Step 5.4.2 of procedure SC.DE-AP.ZZ-0055 (Q), Rev.3, partially states:

> "...Every examined component is to undergo a component acceptability evaluation to determine if the component is acceptable for continued service. This evaluation consists of an initial data screening, a Stage 1 Evaluation, additional evaluation if necessary, and calculation of the re-examination index."

Step 5.4.2.2 further defines the Stage 1 evaluation as consisting of

> "...evaluation consists of calculating the wear rate (WR), remaining life (RL), and predicted remaining wall thickness (t_p) ...
>
> Wear rates can be calculated using a point-to-point calculation or by the band methodology."

The point-to-point method uses the difference in thickness of two inspections for each grid. The wear rate, remaining life, and re-examination index is determined from this difference.

The band methodology consists of evaluating the wear rate and remaining life of the component using each row or column of data. The re-examination index for the component is taken from the minimum remaining life.

As a result of these evaluations (point to point or band method), PSE&G determined that the minimum wall thickness on the feed water elbows stated above might be reached during Cycle 12.

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2) **Are the inspection requirements for this elbow derived from NSAC-202L-R2? If yes, we request that you provide an implementation program to provide adequate controls pursuant to 10CFR 50, Appendix B for the ASME class 1, 2, or 3 components.**

Safety related procedure SC.DE-AP.ZZ-0055(Q), Rev.3 "Detailed Procedure For The Flow Accelerated Corrosion Monitoring Program At Salem Nuclear Generating Station Units 1 and 2," controls the activities associated with the Salem Units 1 and 2 Flow Accelerated Corrosion (FAC) program. Recommendations from NSAC-202L were incorporated into SC.DE-AP.ZZ-0055(Q), and as briefly discussed in response to question number 1 above; this procedure contains the detailed requirements for the component evaluations (Section 5.4).

In addition to providing the necessary requirements in performing the component evaluation, this procedure also establishes the requirements in preparing the component for examination by specifying surface cleaning preparation, and grid location, marking and size.

Note: The Hope Creek Generating Station has its own equivalent procedure, HC.DE-AP.ZZ-0056(Q), Rev.2 "Detailed Procedure For The Flow Accelerated Corrosion Monitoring Program At Hope Creek Nuclear Generating Station." These procedures (SC.DE-AP.ZZ-0055(Q) Rev 3, and HC.DE-AP.ZZ-0056(Q), Rev.2, also satisfy the requirement of Generic Letter 89-08 "Erosion/Corrosion Induced Pipe Wall Thinning" for Salem and Hope Creek Stations respectively, and are presently scheduled to be combined into one common site procedure.

PSE&G believes that these procedures provide appropriate programmatic controls for the erosion/corrosion program at Salem and Hope Creek Generating Stations and are sufficient to provide adequate controls pursuant to 10CFR 50, Appendix B for the ASME class 1, 2, or 3 components.