

April 9, 2002

Mr. Michael A. Krupa
Director
Nuclear Safety & Licensing
Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213-8298

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING PROPOSED USE OF THE NEW
DESIGN OF MECHANICAL NOZZLE SEAL ASSEMBLY (MNSA-2)
(TAC NO. MB4272)

Dear Mr. Krupa:

By letter dated March 1, 2002, as supplemented by letter dated March 6, 2002, you requested Nuclear Regulatory Commission (NRC) staff authorization to use the new design of MNSA-2 in temporary applications as documented in Request for Alternative W3-R&R-002, Revision 0.

During the course of review of this request, the NRC staff determined that additional information is necessary to complete our review. The draft requests for additional information (RAIs) were e-mailed to your licensing staff on March 13 and 21, 2002, and discussed during telephone calls on March 19 and 21, 2002. Your staff agreed to respond within 30 days of the receipt of this RAI. If circumstances result in the need to revise the target date, please call me at the earliest opportunity.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-382

Enclosure: As stated

cc: See next page

REQUEST FOR ADDITIONAL INFORMATION

PROPOSED USE OF THE NEW DESIGN OF

MECHANICAL NOZZLE SEAL ASSEMBLY

TAC NO. MB4272

1. The use of the counter-bore hole has the potential for problems to occur since there is no way to do visual inspections of the area. One problem is the pressurizer material can corrode and the bolts crack if leakage occurs in the annulus region on the external edge of the hole. Please explain how the design eliminates leakage in the annulus region between the pressurizer and the new mechanical nozzle seal assembly (MNSA-2)?
2. Regarding the installation of the MNSA-2, what steps will Waterford Steam Electric Station, Unit 3 (Waterford 3) take to assure that the area of the pressurizer adjacent to the annulus is in a condition to assure that the MNSA-2 will seal correctly?
3. What inspections will Waterford 3 perform to verify pressurizer thickness prior to drilling for the counter-bore and four holes?
4. If leakage occurs, what is the impact on the Grafoil seal.
5. Appendix 1 to Attachment 1, (Request for Alternative, W3-R&R-002, Revision 0), states that the corrosion rate data and the bounding allowable material loss calculations for repair life is 56 years for a pressurizer nozzle. The report that was referenced did not consider the impact of the counter-bore. Please explain if the counter-bore has any effect on the calculations for determining the impact of corrosion on the integrity of the pressurizer?
6. The thermal stress between the rod and the pressurizer wall due to differential expansion is converted into a concentrated normal load acting on the shell. This load is then used with Case 2 to calculate membrane plus bending stresses in the meridional and circumferential directions, assuming the load acts normal to the surface. However, this thermal stress also acts on the hole wall in the radial direction. It should therefore be included as a radial tensile thermal stress in the fatigue analysis.
7. Additional loading on the tapped holes occurs due to differential expansion between the rods and the compression collar, equivalent to a pull-out load acting on the rods. This load acts on the threads as a shear load, creating radial stress in the wall. The stress due to this loading is also a thermal stress and should be included in the fatigue calculations as a tensile thermal stress in the radial direction.
8. What is the basis for using an axi-symmetric thermal analysis for a 3-dimensional geometry, when the nozzle is inclined to the surface at almost 50 degrees?
9. Please provide the rationale for not considering the local shear stresses in the wall between the heater nozzle counterbore and the adjacent tapped holes. These stresses may be of significant magnitude.

10. Please explain if the 3-dimensional finite element analysis reflects the complete local geometry of the tapped holes and the counterbore/heater nozzle.
11. Please provide justification for not including seismic stresses in the fatigue analyses, in particular for the pressurizer side wall and the nozzle grooved section.
12. The comments in 6. and 7. on the inclusion of thermal stresses apply to all tapped holes.
13. Additional information may be requested when the detailed safety evaluation is performed.

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