From: Chia-Fu Sheng
To: Ram Subbaratnam
Date: 08/11/2006 10:48:47 AM
Subject: RAI for the Three Flaw Issues for the Pilgrim LRA

Ram,

Please see the attached.

Simon

CC: Ganesh Cheruvenki; James Davis; James Medoff; Kenneth Chang ; Kimberly Gruss

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Subject:	RAI for the Three Flaw Issues for the Pilgrim LRA
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REQUEST FOR ADDITIONAL INFORMATION
BY CFEB/DCI
APPLICATION FOR RENEWED OPERATING LICENSE
4.3.2.1 REACTOR VESSEL INTERNALS
PILGRIM NUCLEAR POWER STATION
ENTERGY NUCLEAR OPERATIONS, INC
TAC NO. MC9669

RAI 4.3.1.2-1 Control rod drive (CRD) return line nozzle-to-end cap weld Regarding the CRD return line nozzle-to-end cap weld repair, your project report LRPD-06, "Pilgrim NPS License Renewal Project - Time Limited Aging Analyses, Mechanical Fatigue," Response 2.4 refers to Relief Request PRR-36 and concludes, "This relief did not involve any analyses based on time-limited assumptions and therefore is not a TLAA." PRR-36 was submitted by letters dated October 1, 3, and 8, and July 12, 2004, for relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requirements pertaining to the repair of the nozzle-to-end cap weld with a detected flaw and the associated nondestructive examinations. Alternatively, PRR-36 proposed to use ASME Code Case N-504-2, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping," with modifications to perform the repair. The request was approved in a safety evaluation (SE) dated February 25, 2005. ASME Code Case N-504-2 (g)(2) requires a flaw evaluation be performed on the repaired component such that "The evaluation should demonstrate that the requirements of IWB-3640...are satisfied for the design life of the repair, considering potential flaw growth due to fatigue and the mechanism believed to have caused the flaw. The flaw growth evaluation shall be performed in accordance with Appendix C." Explain how Entergy meet the ASME Code Case N-504-2 requirement on performing a flaw evaluation that considers fatigue and the mechanism believed to have caused the flaw. One way to resolve this is to provide document showing that the weld overlay region adjacent to the interface is in the compressive stress zone.

RAI 4.3.1.2-2 Reactor recirculation nozzle thermal sleeves Regarding the flaws on reactor recirculation nozzle thermal sleeves, LRPD-06 Response 2.4 refers to a flaw growth analysis in NEDC-30730 and concludes, "The NRC reviewed and accepted the analysis as documented in an SER (Ref. 4.2.21). As this analysis is only based on 18 months, it is not a TLAA." The cited SE was issued on December 4, 1984. As you stated, the crack growth analysis is for 18 month. One of the six criteria specified in 10 CFR 54.3(a) for classifying an analysis as a TLAA is the analysis "[i]nvolve time-limited assumptions defined by the current operating term, for example, 40 years." The meaning of a crack growth analysis based on 18 months is that the structural integrity of reactor recirculation nozzle thermal sleeves is not only a concern for the extended period of operation but also a concern for the remaining period of operation under the current 40-year license. Therefore, Entergy needs to address the following:

For the LRA:

(1) Confirm whether Report PMA86-07, "Pilgrim Nuclear Power Station Recirculation Inlet Thermal Sleeve Mock Up Fabrication and Evaluation," dated October 1986 had been reviewed by NRC staff
(2) Identify the SE which accepts use of hydrogen water chemistry as the mitigating method and as the basis for Entergy to operate with the flaws on the thermal sleeves beyond 1987
(3) Provide an analysis of the inspection results on these thermal sleeves obtained from

1987 to date

(4) Provide the end-of-extended-period-of-operation (60 years) flaw length of the circumferential through-wall flaw which was 32% circumference in 1987 (per the December 4, 1984, SE for the worst flaw among the detected recirculation nozzle thermal sleeve cracks) and perform a stability analysis for this flaw.

(5) If the stability analysis of effort (4) shows that the predicted end-of-ectended-period-of-operation through-wall flaw length does not meet the ASME Code Section XI margin, provide an impact evaluation on operation and structural integrity of other components due to a broken thermal sleeve piece of a reasonable size

(6) Provide an inspection plan for these detected thermal sleeve flaws in the extended period of operation.

For current operation till the end of 40-year operation:

(7) Discuss the adequacy of the inspection plan for recirculation nozzle thermal sleeves for the remaining period of 40-year operation

(8) Provide the end-of-40-year-operation flaw length of the circumferential through-wall flaw which was 32% circumference in 1987 and perform a stability analysis for this flaw.