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Louise Lund

From: Louise Lund
Sent: Thursday, April 03, 2008 4:54 PM
To: Neil Sheehan
Subject: Fwd: Fatigue-Pro Slides Briefing with Clarification
Attachments: FatiguePro Concern.wpd

>>> Patrick Hiland 03/31/2008 12:48 PM >>>
Louise, please forward the attached to John Adams so he can share with Bruce.

>>> Kamal Manoly 03/31/2008 10:33 AM >>>
Here they are with the clarification requested by Pat.

B/3

March 31, 2008

FatiguePro Concern

- Used extensively in license renewal applications to address the environmental fatigue issue (may also be used in other applications)
- Developed as a monitoring program to track either design cycles or fatigue usage
- Could also be used to perform fatigue usage calculations for design
- FatiguePro usage calculation is based on a simplification of the ASME calculation procedure (tracks one component of stress)
- User must be aware of the program limitations due to the simplification of the ASME calculation
- Subsequent analysis (using the ASME calculation method) of a Vermont Yankee nozzle location found the program application was not conservative (nozzle usage was still acceptable)

Safety Significance

- The fatigue usage at some locations could exceed the ASME Code acceptance criteria, Cumulative Usage Factor (CUF) < 1.0
- This was acknowledged in the resolution of GSI-166 for current operating lifetimes (40 years)
- SECY 95-245 concluded that fatigue failure of piping was not a significant contributor to core-melt frequency
- A more detailed risk assessment performed by PNNL (NUREG/CR-6674) for the resolution of GSI-190 reached the same conclusion for the extended period of operation (60 years)
- Staff required further evaluation for license renewal because of the potential for an increase in pipe leakage due to fatigue during the period of extended operation
- Evaluation of fatigue test data by ANL indicates that there is approximately a one percent probability of initiating a 3mm fatigue crack at a CUF = 1.0

Oyster Creek

- FatiguePro is used at Oyster Creek
- Used to monitor both design cycles and fatigue usage
- Fatigue usage monitoring performed for the feedwater nozzle
- Licensee response to staff RAI indicates that actual fatigue usage is based on a 1977 analysis by MPR Associates
- The licensee submittal does not describe how the data from the 1977 analysis was incorporated in the FatiguePro monitoring (whether one component of the stress is monitored or whether the maximum stress range from the MPR analysis is monitored)