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From: yogengarud@gmail.com
Sent: Wednesday, June 30, 2010 1:56 PM
To: NRCREP Resource
Subject: Response from "Comment on NRC Documents"

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Below is the result of your feedback form. It was submitted by

(yogengarud@gmail.com) on Wednesday, June 30, 2010 at 13:55:36

Document_Title: Generic Aging Lessons Learned (GALL) Report — Draft Report for Comment (NUREG-1801, Revision 2)

Comments: Comments on the Draft NUREG 1801, Rev. 2 [sr1801r2.pdf, May 2010] Section - XI.M17 FLOW-ACCELERATED CORROSION

Comment #1:
This comment addresses the "scope of program" element of the GALL AMP XI.M17. The term carbon steel "lines" seems restrictive and not clearly defined in either the GALL Report (NUREG 1801) or the SRP document (NUREG 1800). Considering the context of remainder elements in this AMP and the intended aging (FAC) covered by the AMP the reviewer suggests that the text be revised to include the following:

"The FAC program is to assure the structural integrity of all carbon steel lines and piping components containing high-energy fluids (two-phase as well as single-phase) is maintained. Valve bodies and other components such as the steam generator tube supports and internals required for the functionality of the high-energy systems are also covered by the program."

Comment #2:
This comment addresses the "detection of aging effects" element of the GALL AMP XI.M17. For better clarity the following changes to the text are suggested:

"A representative sample of components is selected for wall thickness measurements based on the most susceptible locations, every refueling outage. The extent and schedule of the inspections should ensure detection of wall thinning before the loss of intended function."

Comment/Concern #3:
This comment and concern deal with the "monitoring and trending" element of the GALL AMP XI.M17. In this element the GALL Report states:

"CHECWORKS is acceptable because it provides a bounding analysis for FAC. The analysis is bounding because in general the predicted wear rates and component thicknesses are conservative when compared to actual field measurements."

The concern is that the analysis may not necessarily be bounding in every case and the conservatism "in general" may not be sufficient to prevent possible impairment prior to next scheduled inspection. The bounding and conservatism aspects are both subject to (a) input (parameters) assumptions being matched (or not being exceeded) in the service conditions and (b) the uncertainty resulting from these conditions as well as from the model [Ref. 1]. This concern is also supported by (a) the observed spread in comparing the predictions versus observations [Ref. 2], (b) the lack of bounding value of prediction where actual service failures have occurred [Ref. 2], and (c) no explicit accounting for the input and modeling uncertainty in the suggested analysis method.

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Add: R. Gramm (rag)

Therefore, as a minimum, the proper accounting of the uncertainty on predicted wear rates and thicknesses needs to be part of the monitoring and trending activity.

Comment/Concern #4:
This comment and concern deal with the "operating experience" (OE) element of the GALL AMP XI.M17. The OE section needs to cover more recent occurrences such as the feedwater heater rupture at Point Beach 1 [Ref. 3], the feedwater heater leaks at Pilgrim and Susquehanna [Ref. 3], the double-ended guillotine break of 8-inch line at Callaway [Ref. 4]. The OE should also include the Iatan rupture event, discussed in Ref. 2, even though it is from a fossil unit, because of its direct relevance and commonality of conditions with nuclear systems.

It should be noted that even if one accepts the possible administrative errors (such as missing the list of components to be inspected) as a contributing factor to service events, the comparison of actual (observed) wear rate versus model prediction (from these events) are still valid and demonstrate the need to account for uncertainty [Ref. 2].

Other lessons of likely importance suggested by more recent field observations and assessment [Ref. 2] include (a) some cautionary note about "partial" replacements with high-Cr parts in an otherwise susceptible carbon steel line, and (b) the FAC potential for locations with higher and lower temperature ranges than the previously presumed susceptibility range.

References:

1. Garud, Y. S., "Techniques for Improved Reliability of Wall Thinning Estimation," Paper No. PVP2006-ICPVT-11-93414, 2006 ASME Pressure Vessel and Piping Conference, ASME, NY (July 2006).
2. Garud, Y. S., "Issues and Advances in the Assessment of Flow Accelerated Corrosion," Paper No. 203160, presented at the 14th International Conference on Environmental Degradation of Materials in Nuclear Power Systems, Virginia Beach, Virginia, (August 2009).
3. USNRC, "Rupture of the Shell Side of a Feedwater Heater at the Point Beach Nuclear Plant," Information Notice 99-19, June 23, 1999.
4. Union Electric, "Manual Reactor Trip Due To Heater Drain System Pipe Rupture Caused By Flow Accelerated Corrosion, LER 1999-003-01", ULNRC-4233, Union Electric Co., Callaway Unit 1, May 1 (2000). [Also, as Event Notification 36015, August 1999].

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