App B Item 5 10/10/2000

Comments on the IP-2 Lessons Learned Report

General Comment

The document is not clear on the regulatory basis for implementation of the findings (i.e., the whole problem with the regulatory framework). It does not address cost/backfit considerations (see NUREG-0844 and the SG rule). It "pushes" a lot of actions onto industry. Moreover, most of the issues contained in the recommendation for industry are familiar to the technical staff that have been working on revising the regulatory framework since the mid-1990s. It is not clear that the industry will be responsive to these recommendations nor that there is a regulatory basis for turning them into requirements. The lessons learned recommendations are heavily weighted to the industry and the extent to which they will be addressed is basically unknown. This is an awkward position for an NRC lessons learned activity and may have implications in the future for the public comments and confidence in SG tube integrity.

Specific Comments

1. Page 4. Executive Summary. Industry/NEI/EPRI: Item 2) implies that licensee's determine flaws that are left in service based on unqualified sizing techniques. We would not expect this to be the case and Generic Letter 97-05 was issued to address this concern.

2. Page 5. Executive Summary. Industry Initiative and Framework: Item 3) bring up the topic of operability but this topic does not appear to be specifically carried further in the text or on the recommendations. This is a very significant topic as illustrated in the ANO2 experience this summer. Without the connection that was established in the ANO2 TS between the structural performance criteria and operability, it is unclear whether ANO2 would have shut down. During the shutdown in situ testing determined that there was at least one tubes with a burst pressure cof only slightly above the structural performance criteria with two months left in the cycle. Further discussion of this topic is provided in comment 11 below.

Also, given that the proposed TS were developed and submitted by NEI by letter dated February 4, 2000, just before the IP2 tube failure, it is not clear what is intended by the thought that the industry should propose modifications to the framework that consider the IP2 lessons learned and include as a minimum the objective, format and content of the improved Tss. The wording of this recommendation is vague.

3. Page 7. Executive Summary on NRC Regulatory Process, Inspection. It is stated that the NRC has routinely held conference calls with each licensee during their refueling outage to assess the adequacy of the licensee SG tube eddy current inspections. This statement was between about 1994 and 1998. However, starting about two years ago the staff has been selective in making these calls focusing on plants with known SG tube degradation issues.

4. Page 9. Executive Summary. Conclusions and Recommendations indicate that Table 9-1 provides the Task Group's ranking of each recommendation based on its importance relative to

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each of the pillars in the NRC's Strategic Plan. Table 9-1 does not provide such a listing.

5. Page 25. Section 4.5 indicates that under the new TS associated with the industry initiative, the performance criteria would be defined in a licensee-controlled document subject to 10 CFR 50.59. The performance criteria would be in the technical requirements manual (TRM) but the TS would state that these criteria and their associated definitions in the TRM must be reviewed and approved by the NRC.

6. Page 26. Section 4.6 provides a discussion on in situ testing but for completeness this paragraph should also note that this testing is performed to verify leakage integrity at accident conditions. For example, all tubes tested for burst are also tested for leakage and tubes with short cracks not expected to lead to burst are sometimes selected for leakage testing because of the cracks are estimated to be deep.

7. Page 30. Section 5.2. IP2 Event in Context of Previous SG Tube Failures states that the Surry and IP2 events are the only U-bend apex failures attributed to PWSCC. This statement should be clarified to say the only domestic U-bend apex failures or additional discussion should be provided on the U-bend failure at Doel in Belgium.

8. Page 50. Section 6.1.2 on the 2000 SG examination states that licensees should ensure that they have a strategy of enhancing the examination of the outside of the tube is data quality is poor in the U-bend region. **This may not be a realistic recommendation. Emmett or Ken please comment**. *Ted, the message should be that licensees should ensure that data quality is sufficient such that significant flaws are detectable. This can be achieved through appropriate qualification of the technique and the analysts to demonstrate acceptable detection and sizing performance and demonstrating that site-specific conditions affecting the detection and sizing of flaws is within what has been qualified. The qualification data sets should consist of flaws representative of those in the field under conditions representative of those in the field. The flaw signals should exhibit response characteristics and amplitudes similar to similarly sized flaws in the field. The qualification data sets should include representative levels of noise and interference signals as existing in the field. Signal to noise ratios for a given size flaw should be comparable.*

9. Page 58. Section 6.2.2 on Basis and Uncertainties for Detection of Degradation states that the Task Group believes that it would be prudent to develop a blind study protocol for the use of any new probe that includes all areas of the SG that would be challenging to inspect. This appears to be a recommendation that is not discussed or listed elsewhere in the report. *This recommendation sends a bit of a mixed message. Rather than pursuing a protocol for blind studies, we should be pushing the industry to do a better job on their generic and site-specific qualifications; namely using realistic flaws under realistic conditions.*

10. Page 59. Section 6.2.2 on Basis and Uncertainties for Degradation Growth Rates states the Task Group noted that indication size measurements are **always** limited by measurement accuracy, which can account for the supposed "disappearance" of indications. It would be more appropriate to describe this topic in terms of detection rather than measurement accuracy. *Ted,*

the disappearance of indications probably has more to do with making false calls do to signal distortions from a variety of causes.

11. Page 63. Section 6.2.2 on Basis and Uncertainties for Degradation Growth Rates would be more consistent with the discussion on IN 97-26 three paragraphs above if the last sentence on this topic read: "As noted in the above section, detection could be **in excess of** 50%, which reduces the amount of flaw data available to predict growth rates.

12. Page 68. Section 6.3.2 on Technical Specifications provides an opportunity to discuss the topic of operability noted in item 2 above. The IP2 TS provided a mechanism for the staff to be in the approval process for restart. However, in the absence of this almost unique TS at IP2, the staff would have had to establish another regulatory mechanism for ensuring that the SG tubing was operable before restart. As experienced with ANO2, this can be a difficult case to make with the current TS for most plants. Given the significance of SG tube integrity, there should be an explicit TS statement that addresses when SG tubes are operable, i.e., when the performance criteria are being met.

13. Page 71. Section 6.3.2 on Oversight of Contractor's Examination activities states that re-review of the 1997 data raised concerns with the performance of the 1997 data analysts. This statement in inconsistent with the NRC Special Inspection Report issued on August 31, 2000. That report makes no such statement; rather it notes that there was an apparent corrective action violation. Noting that there may have been a data analyst performance issue undermines the NRC's inspection findings and is inconsistent with other discussions on the 1997 data in the Lessons Learned Report.

14. Page 75. Section 6.3.4 recommends that PWR TSs be revised and strengthened to reflect current knowledge of the SG degradation mechanisms, examination techniques, and methodology. This recommendation is inconsistent with the philosophy that the staff has used in its attempts to revise the current regulatory framework. The staff has reasoned that it is important to avoid writing new TS that will also become dated because of changing technology or evolving degradation mechanisms. *That is the reason the staff has been pursuing a performance-based approach with the industry instead of a prescriptive approach.*

15. Page 97 Section 7.2 on NRR Actions/Response Related to the RES Review states that because of large measurement uncertainty it is very difficult to accurately evaluate crack growth rates and, therefore, one cannot accurately predict the size of a flaw at the end of an operating cycle. This statement has some profound implications for the validity of operational assessments. The comment, as written, could draw into question the operation of PWRs, in general. Context for this comment may be the following:

"For a specific flaw, uncertainties in the measurement may mask the true growth rate of the flaw. As a result, if conservative assumptions are made regarding the threshold of detection and the growth rate, accurate/reasonable predictions of the size of the flaw at the end of an operating cycle are difficult. Nonetheless, when the integrity of the steam generator is evaluated and uncertainties are accounted for in probabilistic terms, realistic projections of the end of cycle

flaw distribution are possible as evidenced by the operational assessments performed as part of Generic Letter 95-05."

Ted, an additional thought. Eddy current measurement error is typically dominated by random rather than systematic error. This tends to spread out the apparent growth rate distributions. Since the upper tail of the growth rate distribution drives the analysis, random error can generally be expected to lend an element of conservatism to the growth rate distribution.

16. Page 124. Section 8.2.4 on Recommendations. This section contains a recommendation that indicates that the staff should develop, revise, and implement, as appropriate, the process for timely dissemination of technical information to the inspectors to ensure that relevant technical information is reviewed and considered for inclusion in the inspection program. Since July 1997 the staff has held interface telephone conference between headquarters and the regions three to four times a year to discuss operating and inspection experience. During these phone calls the NRR staff has provided technical information on issues relevant to the conduct of the regional SG inspections. For example, the staff has discussed information notices and generic letters under preparation, generic information obtained during conference calls with licensees, and broader issues such as the status of efforts on the regulatory framework and the RES program on steam generators.

These interface meetings are not discussed in the lessons learned report. Moreover, it is not clear that a new mechanism needs to be developed to disseminate information of the type noted in this recommendation.

17. Page 127. Section 8.3.2 on NRC Position on Industry Guidelines indicates that DG 1074 takes the position that NDE techniques and NDE personnel be qualified in accordance with Appendices G and H of the EPRI PWR Steam Generator Examination Guidelines. This statement may be misleading since DG 1074 contains guidance with respect to NDE qualification under various circumstances that goes well beyond the EPRI guidelines. *Yes, qualification per the EPRI guidelines is necessary, but not necessarily sufficient.*

18. Page 129. Section 8.3.4 on Recommendations. The second recommendation is for an interim NRC generic communication clearly delineating the current state of SG tube integrity program guidance, sources of guidance for licensee use, and what steps licensees need to take in addition to using guidelines, to provide reasonable assurance of SG tube integrity. Given limited resources to produce such a communication and the fact that we would be working at the same time on the recommendation to make the NEI SG initiative a high priority, this effort would seriously detract from working on the NEI SG initiative. The RIS and safety evaluation the staff prepares on the NEI SG initiative will be the best vehicle to address this recommendation. In the interim the staff have been very deliberate in documenting its views on and the status of various sources of guidance in safety evaluations, information notices, generic

letters, Commission papers and letters to the industry and we do not believe that the benefits of implementing this recommendation would offset the impact it would have on the initiative.

19. Page 96, bottom line. The word "even" should be deleted to make the sentence correct.

20. Page 97, footnote 9. The last sentence is incorrect. Had we not approved the extension, the tech specs would have required plant shutdown in June 99 because the tech specs limit the inspection interval to no more than 24 ***calendar*** *months. It is entirely possible that an inspection at that time may have detected the flaw which later failed. The point that should be made is that the tech specs allow the inspection interval to be as much as 24 calendar months. Had IP-2 operated continuously (without the 10 month maintenance outage) upon startup from the 1997 inspection outage, the tube that failed would have failed even without an extension of the inspection interval.*

21. Page 98, conclusion 3. Incorrect as written. Can fix as follows: "The tech specs allow the inspection interval to be as much as 24 calendar months. Had IP-2 operated continuously (without the 10 month maintenance outage) upon startup from the 1997 inspection outage, the tube that failed would have failed even without an extension of the inspection interval."