From: Daniel Holody
To: David Lew
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Subject: Violation and Performace Assessment

APPARENT VIOLATION

10 CFR 50, Appendix B, Criteria XVI, requires that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude recurrence.

Contrary to the above, during the 1997 refueling outage, a significant condition adverse to quality existed at Indian Point 2, namely, primary water stress corrosion cracking (PWSCC) flaws in the small radius u-bends of four tubes in steam generators; however, as of February 15, 2000, when one of those tubes failed while the plant was at 100% power, measures were not established to ensure that the condition adverse to quality had been identified and corrected, despite opportunities that existed to do so. Those prior opportunities involved other significant conditions adverse to quality for which the causes had not been determined. Specifically, during eddy current testing of steam generators during the 1997 outage,

1. a PWCSS crack was identified at the apex of one of the low row tubes. Since this was the first time in the facility's history that a crack had been identified at the apex of any tube, it signified the potential for other similar cracks in the low row tubes.

2. indications of tube denting were discovered for the first time in the uppermost support plate of certain low row tubes when restrictions were encountered as eddy current probes were inserted into those tubes. These restrictions in 20 tubes signified the susceptibility to deformation of the flow slots (hour-glassing) in the uppermost support plate, which, in turn, places additional PWCSS stresses on those tubes.

3. significant electrical interference (noise) was encountered in the data obtained during the actual eddy current testing of several other low row tubes, which could impeded detection of that existed in other tubes.

Although the indications of tube denting at the 20 locations, and the identification of the apex crack in one of the small radius tubes, collectively increased the potential for similar steam generator tube flaws existing in other locations, the licensee (1) did not evaluate nor take action to correct and account for these impediments (to detection of any other flaws) that the noise created at the time; and (2) did not adjusted or modify inspection methods and analysis during the inspections process to account for the anomalies and other new conditions encountered.

PERFORMANCE ISSUES FOR THE COVER LETTER

The team concluded that the overall technical direction and execution of the 1997 steam generator inspection were deficient in several respects. The steam generator inspection program did not ensure that

- known and likely potential degradation mechanisms were accounted for
- conditions that increased the susceptibility of tubes to these degradation mechanisms were accounted for
- conditions that challenged or limited detection capabilities were accounted and compensated for
- inspection methods and analysis during the inspections process to account for the anomalies and other new conditions encountered were adjusted or modified