

Lead
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Subject: a similar NOV

leading with program stuff...

Trying to lead with the general...and then get to specifics...

This version following a discussion between myself, dan H , and Hub.

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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, prior to and during the 1997 refueling outage, a significant condition adverse to quality existed at Indian Point 2 which was not identified and corrected; namely, Con Edison did not take actions to adequately identify and evaluate a new SG tube degradation mechanism, nor did they adequately account for, adjust, or modify their eddy current inspection program in response to this new condition (primary water stress corrosion cracking (PWSCC) flaws in the low row U-bends). Four tubes with indications were not promptly identified in the 1997 outage and were left in service. As a consequence, this condition existed through February 15, 2000, when one of those tubes failed while the plant was at 100% power.

Despite opportunities that existed to do so, some readily available, ConEd did not take adequate steps to account for conditions which increased the susceptibility of SG tubes to this degradation mechanism. Those prior opportunities involved other significant conditions adverse to quality for which the causes had not been determined. Specifically, during ECT of SGs during the 1997 outage,

1. a PWSCC crack was identified at the apex of one of the low row U-bend 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. This new degradation mechanism was not entered into Con Edison's corrective action program, indicating a clear missed opportunity to evaluate the increases susceptibility of tubes to this degradation mechanism.
2. indications of tube denting were discovered for the first time in the uppermost tube support plate (TSP) of SG tubes when restrictions were encountered as ECT probes were inserted into those tubes. Restrictions in 19 low row tubes signified: a) an increased probability of deformed flow slots (hour-glassing) at the uppermost TSP, and b) an increased susceptibility to additional stresses on the low row U-bend tubes. These conditions were prime precursors for PWSCC that were not adequately evaluated.
3. significant ECT signal interference (noise) was encountered in the data obtained during the actual ECT of several low row U-bend tubes. This significant noise level increased the probability that a defect, that may have existed in other tubes, was not identified. Additionally, the program was not modified to account for, or address site-specific SG conditions that may have been contributing to this adverse condition.

As a result of not addressing these specific conditions, and collectively not adequately evaluating the adequacy of their SG program for evaluating and addressing this new SG degradation mechanism, a minimum of four tubes were left in service following the 1997

inspection, until the failure of one of these tubes occurred on February 15, 2000.