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SUBJECT: Informs NRC of util continuing investigations of
 Feedwater Sys erosion/corrosion & to advise NRC of future
 actions re issue.

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U.S. Nuclear Regulatory Commission
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SUSQUEHANNA STEAM ELECTRIC STATION
FEEDWATER SYSTEM EROSION/CORROSION REPAIR
PLA-4226 **FILE R41-2**

Docket No. 50-387

- References:
- 1) NRC letter from Mr. J.J. Raleigh to Mr. H.W. Keiser, "Summary of Meeting With Pennsylvania Power & Light Company (PP&L) on the Feedwater 'Tee' Weld Overlay Thinning," dated June 12, 1992.
 - 2) PLA-3796 from Mr. H.W. Keiser to Mr. C.L. Miller, "Technical Safety Assessment of Feedwater System With As-Found Pipe Wall Thinning," dated June 17, 1992.
 - 3) NRC letter from Mr. M.W. Hodges to Mr. H.W. Keiser, "Clarification of PP&L Commitments to NRC on the Feedwater Piping X-175," dated July 30, 1992.
 - 4) NRC letter from Mr. J.J. Raleigh to Mr. H.W. Keiser, "Safety Evaluation of the Pennsylvania Power & Light Technical Safety Assessment of Feedwater Location X-175, Susquehanna Steam Electric Station, Unit 1," dated October 15, 1992.
 - 5) PLA-3941 from Mr. R.G. Byram to Mr. C.L. Miller, "Feedwater System Erosion/Corrosion Repair," dated April 19, 1993.
 - 6) NRC letter from Mr. R.J. Clark to Mr. R.G. Byram, "Feedwater System Erosion/Corrosion Repair, Susquehanna Steam Electric Station," dated July 19, 1993.
 - 7) PLA-4035 from Mr. G.T. Jones to Mr. C.L. Miller, "Feedwater System Erosion/Corrosion Inspection Results for U1-7RIO and Withdrawal of Relief Request No. IRR-24," dated October 20, 1993.

Dear Sir:

The purpose of this letter is to inform NRC of PP&L's continuing investigation of Feedwater System erosion/corrosion and to advise NRC of future PP&L actions regarding this issue.

BACKGROUND

During the Susquehanna Unit 1-5th Refuel and Inspection Outage (U15RIO), initial baseline data for monitoring of erosion/corrosion degradation was obtained in the ASME III, Nuclear Class 1 portion of the Feedwater Piping. Follow-up inspection during the U16RIO identified a localized area which appeared to be eroding at an excessive rate (up to 0.15 in./cycle). Available data

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indicated that the thinned area (0.48 in. minimum measured thickness) at a 12" butt-welded tee connection would infringe upon design minimum wall (0.43 in.) before the end of the seventh fuel cycle. Since it was impracticable to isolate the piping for replacement of eroded material, a full circumferential external weld reinforcement (overlay) was designed and installed to restore wall thickness and to compensate for further flow assisted corrosion. Subsequent communications between PP&L and NRC relative to the repair are documented in the above listed references.

CURRENT SITUATION AND COURSE OF ACTION

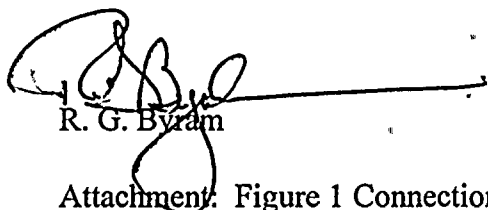
As stated in Reference 7, follow-up examinations performed during the Fall, 1993 U17RIO confirmed that actual erosion rates occurring at the joint were, in fact, similar to the remainder of the system (approximately 0.020" on average). The examinations also better defined the actual internal surface configuration and appear to confirm the hypothesis that the wall thinning believed to be caused by excessive flow assisted corrosion was actually the result of an original construction anomaly. This hypothesis is explained as follows:

External surface profile measurements and visual inspections performed prior to application of the reinforcement identified an approximate 1/8" (maximum depth) depression in the area of corrosion similar to that which would occur during outside diameter (O.D.) shrinkage resulting from localized weld repair. (Refer to Figure 1.) Also, construction documentation indicates that the original field weld had been cut out completely, re-fit and re-welded, apparently to achieve proper strain free alignment at the reactor pressure vessel nozzle connection on the upper end of this portion of pipe. During the course of fit-up for the new (second) weld, any permanent O.D. pipe shrinkage resulting from weld-out or repair of the original joint would require compensatory inside diameter (I.D.) grinding in order to meet Code fit-up requirements. This would result in localized reduction of pipe wall at the area of concern. Based on the actual O.D. surface profiles taken before the weld build-up was applied, this would have reduced the available wall thickness by about 1/8" prior to weld-out of the joint for the second time. This would account for the observed difference in thickness between the area of concern and the remainder of the joint.

The initial estimate of 0.150" per cycle erosion between the U15RIO and U16RIO was based on a single data point taken during U15RIO. If this initial data was taken on the shoulder of the weld crown (all subsequent data was taken at the toe of the crown), calculations would indicate a discrepant erosion rate of about 0.150" for the sixth fuel-cycle vs. the .020" - .030" presently observed.

Based on the above, we have concluded that the reduction in pipe wall observed at X-175 (DCA-110-1, FW 15) actually occurred during original construction. We consider this construction discrepancy rectified by taking credit for that portion of the weld overlay (1/8" maximum in the area of concern) which restored the wall lost due to I.D. grinding during fit-up of the final installation weld. Note that when considered as a repair for an original construction deficiency, any provisions of ASME Section XI inferring requirements for removal of service induced defects no longer apply.

Very truly yours,



R. G. Byram

Attachment: Figure 1 Connection X-175 Cross-Section

cc: NRC Region I
Ms. M. Banerjee, NRC Sr. Resident Inspector - SSES
Mr. C. Poslusny, Jr., NRC Sr. Project Manager - Rockville
Mr. R. A. Hermann, NRR-Rockville

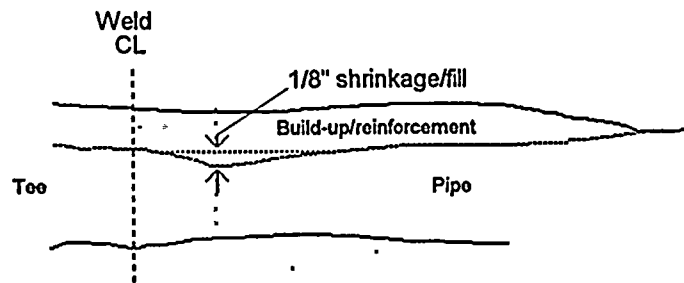


Figure 1
Connection X-175 Cross-section

Figure 1