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FYR 86-092

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Ms. Eileen M. McKenna
Project Manager, Project Directorate No. 1
Division of PWR Licensing - A

References:
(a) License No. DPR-3 (Docket No. 50-29)
(b) Letter, YAEC to USNRC, "IPSAR Sections 4.4, 4.5, 4.8, 4.9, and 4.11," dated March 14, 1986
(c) Letter, YAEC to USNRC, "Resolution of SEP Topic III-5.A, Item 1," dated September 27, 1984
(d) Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Report Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops," dated February 1, 1984
(e) NRC Document, "Guidance for Resolution of High Energy Pipe Break Locations where Remedial Modifications are Impractical"

Subject: SEP Topic III-5.A

Dear Ms. McKenna:

Reference (b) contains your remaining set of questions regarding SEP Topic III-5.A. Additional information was requested by the staff to complete their review of this topic. This letter addresses the questions in the order they appear in Enclosure 3 of Reference (b).

1. 5-Inch Recirculation Crossover Line

Yankee submitted Reference (c) to address Section 4.9, Item 1 of NUREG-0825. This evaluation used Reference (d) as a basis for the applicability of the Leak-Before-Break (LBB) concept to the 5-inch recirculation lines.

The staff agreed that the LBB approach is an acceptable alternative to assuming double-ended breaks in main coolant piping systems. However, since the criteria in Reference (d) was developed for large recirculation piping, the staff concluded that performing a fracture mechanics analysis in accordance with Reference (e) would fully resolve the issues concerning the 5-inch recirculation line.

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Enclosed is our evaluation of the 5-inch recirculation piping, Impell Report No. 09-0570-0055, Revision 0. The evaluation demonstrates that sufficient margin against unstable crack extension exists for this piping when subjected to postulated seismic and normal operating plant loads.

The leakage which could occur from a postulated throughwall crack during normal operating conditions would be detected, thereby assuring safe shutdown of the plant.

The Leakage Detection Systems installed at Yankee Nuclear Power Station were reviewed in accordance with the requirements of Regulatory Guide 1.45 under SEP Topic V-5. The staff found the existing plant leakage detection systems to be satisfactory with at least three separate systems capable of detecting a one gpm leak within one hour. All systems are monitored in the Control Room and will alert the operator in the event threshold level leakage occurs within the Vapor Container. This capability to identify inconsequential leakage quite rapidly has been proven during plant operation.

We believe we have resolved the staff's concerns regarding the integrity of the 5-inch recirculation line.

2. Analysis of a Rupture of a Main Steam Line at a Steam Generator

An analysis was performed to determine the force imparted on a steam generator from a horizontal break at the main steam outlet.

The results of this analysis indicate that the steam generator would not be capable of withstanding a horizontal load of the magnitude resulting from the postulated steam line rupture. Furthermore, design modifications are not practicable for the following reasons:

(a) The postulated rupture of this line at this location is highly unlikely. The maximum computed stress in this line is well below the code allowable stress, using loads induced by the NRC site-specific seismic spectrum.

(b) A pipe/component whip device would be required to resist the forces resulting from this postulated break. Installation of whip restraint mechanisms is contrary to the current NRC/industry position on these devices. It has been shown that these devices do not necessarily increase the overall safety of piping systems and components.

(c) Yankee has installed an acceptable leakage detection system (Section 4.16 of NUREG-0825). If a leak were to occur, it would be quickly identified.

As an acceptable alternative, it is our position that an augmented Inservice Inspection (ISI) Program to inspect these welds be implemented (see Figure 1). We propose to inspect these welds on a one time basis during the 1987 ISI to ensure that this area of piping is acceptable per ASME Section XI criteria.

3. Two-Inch Steam Generator Blowdown Line

Yankee has evaluated the effects of jet impingement on a steam generator blowdown line. One line must remain intact so that a steam generator is available for decay heat removal.

The blowdown piping has been analyzed to include this jet impingement load. As a result, some support modifications are necessary. The supports for the blowdown lines will be modified in accordance with our integrated schedule for SEP Topic III-6 plant modifications.

We believe the above actions and information are prudent and acceptable to satisfactorily resolve these SEP open items. It is our understanding that a supplement to NUREG-0825 will be issued which will address the resolution of SEP Topic III-5.A. We trust that the information provided herein is satisfactory and look forward to receiving your final assessment.

Very truly yours,

G. Papanic, Jr.
Senior Project Engineer
Licensing

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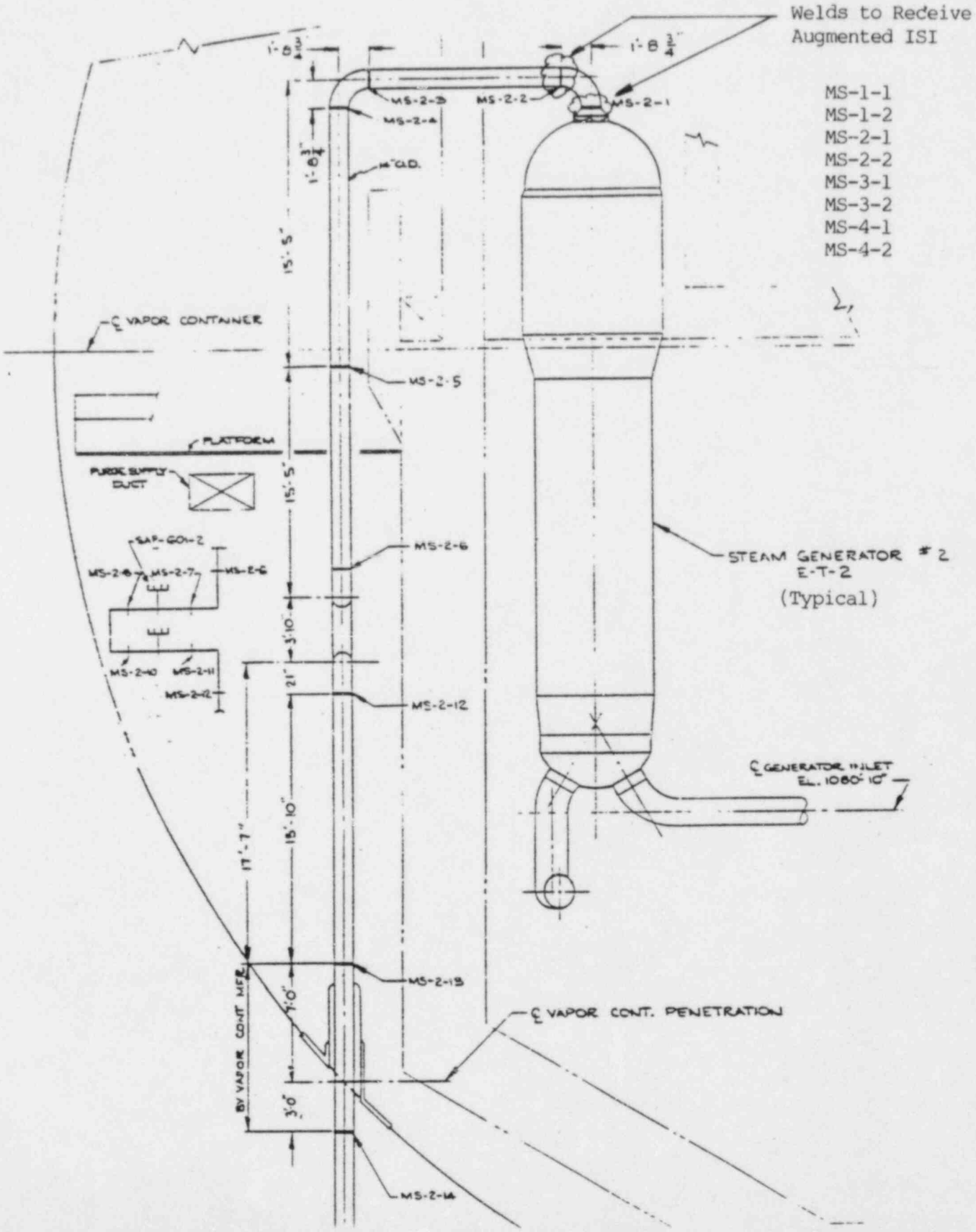
Attachment

FIGURE 1

STEAM LINE WELDS



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