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MURRAY R. EDELMAN
VICE PRESIDENT
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September 18, 1984
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Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Perry Nuclear Power Plant Units 1 & 2
Docket Nos. 50-440; 50-441
Clarification to the "Steam
Erosion Hazards Analysis" Report

Dear Mr. Youngblood:

This letter provides our response to the August 28, 1984 request for additional information relative to the Perry Nuclear Power Plant "Steam Erosion Hazards Analysis" report.

The letter requests information on (a) the statement "Jet loads from smaller lines on larger lines are similarly insignificant, compared to other design loads including loads from larger jets," (b) the statement "Jets from any main steam break on the large B33 piping would not be significant compared to other design loads," and (c) the items in Tables 7 and 8 which utilize the resolutions "remote from jets and pipe whip."

a). This reference is taken from the first part of Section 2.2.1.1 which discussed whether a steam line break in the drywell could result in a failure of the reactor coolant pressure boundary (RCPB) greater than that for which safe shutdown systems are designed. The report notes that the only combination of steam line breaks plus breaks in other RCPB lines which could possibly exceed the maximum allowable size for an RCPB break is a break in either:

1. Two main steam lines or,
2. One main steam line and one recirculation loop.

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It is not possible to exceed the maximum allowable RCPB break in the event that a smaller line breaks concurrently with one of these larger lines. This is independent of which line caused the impingement. Therefore, the jet load resulting from a small line break in the drywell is not a concern.

b). As noted in the previous paragraph only two main steam lines or a main steam and recirculation (B33) line break can possibly exceed the maximum RCPB break. In the first case, the main steam lines are designed to withstand loads from a break in an adjacent main steam line. In the second case, the jets from any main steam line break on the large B33 piping would not be significant compared to design loads, based upon the separation between the two lines (13 feet at the minimum) as well as the large platforms and restraint structures between the two piping systems.

As additional assurance, the expected effects of steam erosion in the main steam line were evaluated (Attachment 1 to the report). Based on the operational conditions and expected operational history, material loss for a 40 year plant life is negligible. Therefore, effects on the large recirculation piping are not of concern since a main steam line break due to steam erosion is not a credible event. This is the same resolution used for the reactivity control concerns of section 2.2.1.1 and is applicable to the RCPB concerns discussed here.

c). Eleven items in Tables 7 and 8 (detailed below) were resolved with the justification that the items are remote from jets and pipe whip. Each of the items of concern are contained within the same room as one steam line (an RHR steam condensing mode 10 inch line). Steam erosion in this line is expected to be very low (Attachment 1 to the report). The minimum separation is 31 feet between any of these items in question and the steam line. There are considerable amounts of piping, pipe supports and structure in the intervening space. The justification is supported by a jet impingement analysis performed on the 10 inch RHR steam condensing line as part of the pipe break analysis completed previously to meet the requirements of SRP 3.6. The jet impingement pressure at a distance of 25 ft. resulting from a full circumferential break of this line is approximately 8.45 psig. This does not take into account the considerable intervening structures. This supports our conclusion that at 31 ft. of separation there is adequate protection from jet impingement concerns. All of the above factors support the justification that the items are sufficiently remote from jets and pipe whip.

Despite this, additional detailed review was performed on the above items in order to resolve the apparent NRC concern while still remaining within the methodology of the steam erosion report as outlined in the introduction. Additional resolution bases are provided in Attachment A to this letter, which correspond both to the tables and the discussions in Section 2 of the report.

Items 6.4.33 through 6.4.36 (ECCS HVAC circuits) in Table 8 are in the same room as the above items. The primary resolution is that erosion in this RHR steam condensing line is expected to be negligible, as evaluated in Attachment 1 to the report. In addition, it is stated that there is "sufficient separation from pipe whip and low probability of jet impact." The intent of this statement was that the pipe whip or jet impingement resulting from the most probable location of a steam erosion break would not effect these circuits.

However, a more detailed review of each circuits' function was completed to identify additional justification to support the resolution of these items. All four circuits are associated with division two power servicing only RHR B and C loops of the ECCS. Redundancy is available in the ECCS to achieve safe shutdown without these loops. Consistent with the report methodology, redundancy is available to provide the intended function.

The above clarifications should provide the input necessary to allow completion of the Staff evaluation on this issue.

If there are any further questions, please feel free to contact us.

Very truly yours

Murray R. Edelman
Vice President
Nuclear Group

MRE:njc

Attachment

cc: Jay Silberg, Esq.
John Stefano
Jack Grobe

Attachment A

Item #	Concern	Minimum Separation from Break	Additional Resolution
3.4.1	Containment boundary (D23 piping)	31 ft	Postulated break does not require containment isolation
3.4.9	Containment boundary (M51 piping)	31 ft	Postulated break does not require containment isolation
4.4.1	Suppression Pool instrumentation for HPCS (impulse lines)	31 ft	Redundant ECCS systems available
4.4.2	Suppression Pool instrumentation for HPCS (impulse lines)	31 ft	Redundant ECCS systems available
4.4.3	Suppression Pool instrumentation for Make-up System (impulse lines)	50 ft	Not required for postulated event. Necessary only for LOCA condition
4.4.4	Suppression Pool instrumentation for Make-up System (impulse lines)	50 ft	Not required for postulated event. Necessary only for LOCA condition
5.4.25	Containment Boundary (Position switch for CIV)	31 ft	Postulated break does not require containment isolation
5.4.26	Containment Boundary (Position switch for CIV)	31 ft	Postulated break does not require containment isolation
5.4.27	Containment Boundary (Position switch for CIV)	31 ft	Postulated break does not require containment isolation
5.4.28	Containment Boundary (Position switch for CIV)	31 ft	Postulated break does not require containment isolation
5.4.29	Containment Boundary (Position switch for CIV)	31 ft	Postulated break does not require containment isolation