Docket No 50-397

50.55(e) Report

Washington Public Power Supply System

P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

Docket No. 50-397

July 13, 1982
G02-82-605

Mr. R. H. Engelken
U.S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

Subject: NUCLEAR PROJECT NO. 2
10CFR50.55(e) POTENTIALLY REPORTABLE CONDITION #179
CONTAINMENT PENETRATION PIPING/VALVES

References:
a) Telephone conversation between R.T. Johnson (Supply System) and J. Elin (NRC) on February 18, 1982, Telecon #QA2-82-048
b) Letter G02-82-0331, dated March 19, 1982, R.G. Matlock to R.H. Engelken, same subject
c) Letter G02-82-0407, dated April 30, 1982, R.G. Matlock to R.H. Engelken, same subject.

In the above referenced telecon the Supply System informed your office of a potentially reportable deficiency under 10CFR50.55(e) and references b) and c) were interim status reports on the identified condition.

Attachment 1 to this letter provides the Supply System's final report on the above caption condition. The attachment includes a restatement of the problem and a description of the safety implications associated with failure of a containment penetration. Attachment 2 depicts a typical containment configuration for reference.

If there are any questions on this item, please contact R. T. Johnson at (509) 377-2501, extension 2712.

R.G. Matlock
Program Director, WNP-2

LCF/kd

Attachments: 1. Final Report
2. Typical Containment Configuration

cc: W.S. Chin, BPA - Site
R.A. Feil, NRC Resident Inspector - Site
A. Forrest, Burns and Roe - HAPO
N.D. Lewis, NRC
J. Plunkett, NUS Corp.
R.E. Snaith, Burns and Roe - NY
V. Stello, NRC
WNP-2 Files

IE27

S2-144

ATTACHMENT 1

FINAL REPORT
SUPPLY SYSTEM NUCLEAR PROJECT NO. 2
DOCKET NO. 50-387 - LICENSE NO. CPPR-93
10CFR50.55(e) CONDITION #179
CONTAINMENT PENETRATION PIPING/VALVES

Potential Problem

The Architect Engineer may have incorrectly specified design temperatures for certain containment penetration piping and valves. Approximately 21 penetrations have been identified in which piping and/or valves, considered as part of the containment boundary, were specified with a system design temperature lower than the containment design temperature of 340° F. for the drywell or 275° F. for the wetwell.

Because the process fluid temperature was used rather than the containment design temperature, the piping and valves serving as containment boundaries may not meet the post accident function requirements of ASME Section III, Subsection NE.

Safety Implications

A failure of containment piping or isolation valving in the post-LOCA containment environment could result in the loss of certain ECCS functions, a release of radioactivity to the environs in excess of 10CFR100 limits, as well as other implications dependent upon the particular penetration involved.

Action Taken

The AE has conducted an extensive evaluation to confirm that the piping attached to containment penetrations was designed to the applicable Code requirements of ASME Section III. The evaluation indicated the following Subsections of ASME Section III were utilized for the design of containment penetrations:

- The Architect Engineer did utilize the applicable design rules of ASME Section III, Subsection NE-3620 for the design of containment piping penetrations.

- ASME Section III, Subsection NE-3620 requires NB-3600 or NC-3600 to be applied to the design of piping systems in the containment system.

- The above subsections of ASME Section III do require a stress evaluation for all various postulated combinations of normal and upset conditions, but do not require a stress evaluation for faulted secondary stresses (as in a post-LOCA condition). Additionally, the application of post-LOCA environmental effects, as referenced in ASME Section III, Subsection NG-3213.9, is not expected to cause a failure.

With respect to the affected containment penetration isolation valves, the Architect Engineer evaluation of the seismic stress reports and/or valve code data reports for each containment penetration isolation valve, indicates the valves meet ASME Section III Subsection NB-3500 or NC-3500 requirements.

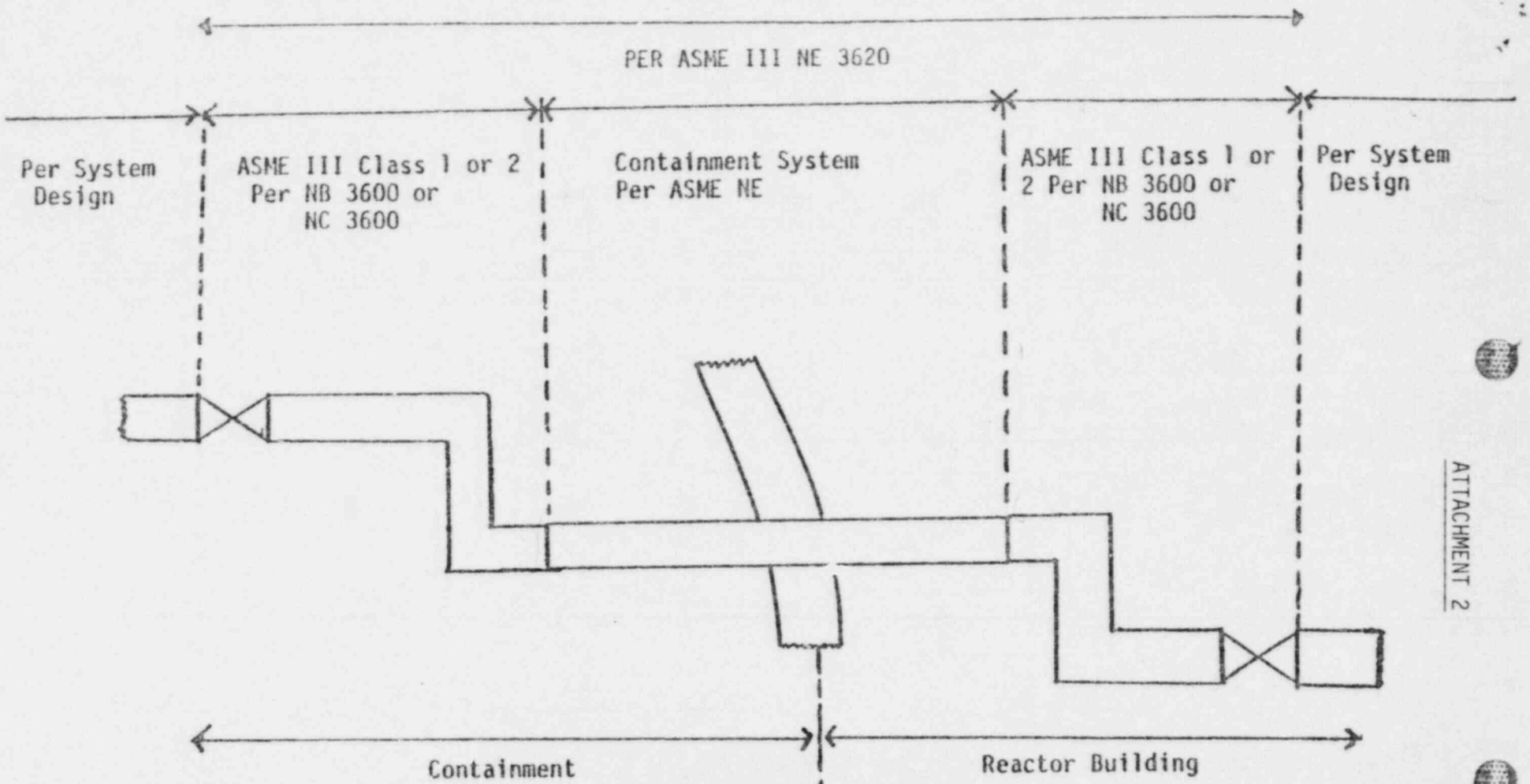
Current Status

Supply System Engineering has completed an evaluation of the report submitted by the Architect Engineer and has determined that the Architect Engineer did properly specify temperatures for piping and valves attached to containment penetrations for post-LOCA accident conditions.

Valves - All of the subject valves are ASME III, Class 2, only one of which is an active component inside containment. Valve suppliers were required to meet the pressure-temperature requirements of ASME Section III, Subsection NB-3500, NC-3500 or ANSI B16.5, as applicable, all of which exceed post-LOCA accident temperature requirements. Additionally, as required by the applicable contract specification, Seismic Class I valves were designed to withstand minimum end loads of 750z foot pounds moments and 75z pound forces applied simultaneously in all three orthogonal directions. This resulting load is equivalent to a pipe stress of 15,600 psi. The above design requirements provide assurance of valve operability under stress due to the conservatism used in the design and always results in a greater stress margin for valves as compared to piping.

Piping - All of the subject penetrations and piping are ASME III, Class 2. In piping analysis, maximum stress generally occurs at points of higher stress intensified locations such as elbows or tees; a Stress Intensification Factor (SIF) of 2.5 is quite typical at such locations. The ASME Class 2 allowable thermal piping stress for carbon steel is 22,500 psi. This allowable divided by the typical SIF of 2.5 produces a pure piping stress limit of 9,000 psi, which is much less than the equivalent valve stress limit of 15,600 psi. Therefore, the allowable stress for valves is much higher than the maximum allowable stress produced by the piping system; the piping system can not produce thermal stress on the associated containment isolation valves in excess of valve design loads. Consequently, piping loads will not affect valve operability during a post-LOCA accident condition.

Based on the above, the Supply System has determined this item to be not reportable under the provisions of 10CFR50.55(e).



Containment Post-LOCA

	Drywell	Wetwell
Temperature	340° F	275° F
Accident Pressure	34.7 PSIG	34.7 PSIG
Design Pressure	45 PSIG	45 PSIG

ATTACHMENT 2