Office of Manag.

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Portland General Electric Company
Trojan Nuclear Plant
P.O. Box 439
Rainier, Oregon 97048

October 16, 1978
BDW-996-78

Mr. R. H. Engelken, Director
Nuclear Regulatory Commission, Region V
1990 North California Blvd.
Walnut Creek, California 94596

Dear Sir:

Per Section 6.9.1.8.i of the Trojan Nuclear Plant Technical Specifications, Licensee Event Report 78-20, Revision 2 is submitted. The report is required because we have found it necessary to make some support modifications to several piping systems in order to prevent operation in a manner less conservative than assumed in the safety analysis report accident analysis.

With the LER is a detailed explanation.

Sincerely,

B. D. Withers
Plant Superintendent

BDW/MAB:mm

Attachments

J. L. Williams
C. Goodwin, Jr.
D. J. Broehl
R. L. Sullivan
S. L. Loy
S. R. Christensen
Nuclear Operations Board
Trojan Operating Committee
Plant Review Board
L. W. Quinn
D. F. Kielblock
C. J. Fleming
L. W. Erickson
Shift Supervisors
F. D. Miller, DOE/EFSC
Office of Management Information and Program Control
Edison Electric Institute - Patricia Higgins
File 93.24a

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REPORTABLE OCCURRENCE

1. Report Number: 78-20, Revision 2.

2. a. Report Date: October 16, 1978.

   b. Initial Report Date: July 21, 1978. Revision 1· October 6, 1978.

   c. Occurrence Date: June 22, 1978.

3. Facility: Trojan Nuclear Plant, P. O. Box 439, Rainier, Oregon 97048.

4. Identification of Occurrence:

   Piping penetrations not designed to be solidly grouted were found tc be solidly grouted. During subsequent design review and stress analyses, excessive support or pipe stress was found on thirteen isometrics.

5. Conditions Prior to Occurrence:

   The plant was in Mode 5, cold shutdown, at the time of this event. Reactor Coolant System temperature was 160°F and pressure was 335 psia.

6. Description of Occurrence:

   During late 1977 and early 1978, while investigating independent plant problems, questions arose concerning a solidly grouted pipe penetration. Design stress calculations assumed an unrestricted penetration. A design review, stress analysis, and field survey of selected penetrations for high stress levels was conducted. In June, 1978, a piping section was calculated to have stress levels above code allowable during design conditions, resulting in Licensee Event Report 78-20. The field survey, design review, and stress analysis to check piping and penetrations was completed. Isometrics were selected for the survey as follows:

   a. All isometrics classified as Seismic Category I except most piping in Containment. Piping in Containment was generally not surveyed because:

      1. A review of piping arrangements and isometric drawings, depicting accumulator safety-injection systems and component cooling water lines to Containment air coolers, demonstrated that piping was routed around biological shield walls or through pipe chases;

      2. The results of a survey including 20% of Nuclear Class 1 piping revealed no discrepancies; and

      3. A review of design criteria for incontainment piping indicated an absence of requirements for sealing penetrations for fire, flooding, shielding, H&V separation or for any other reason.

   b. Piping listed on the architectural drawing penetration schedules.

c. Other piping which is classified as hanger critical except where grouted penetrations simply were not used.

Of the approximately 700 isometric drawings surveyed, 50 involving Seismic Category I piping required specific stress analysis. Conservatively assuming that the grouted penetrations act as an anchor stress levels were found unacceptable on 13 isometrics. In some cases pipe stress exceeded the maximum allowed by ANSI B31.7, in others the support loads were unacceptable. A summary of the affected piping and the type of stress involved is presented in the attached table.

7. Designation of Apparent Cause of Occurrence:

Efforts to determine the cause of problems identified included the review of various Seismic Category I piping isometric drawings depicting as-built conditions, associated penetration schedules, and appropriate contract documents and correspondence. In summary, we determined that the selection and installation of penetration details during construction was not part of a controlled process.

8. Analysis of Occurrence:

This occurrence has had no effect on either the plant or public safety. Stress levels the piping has been exposed to are below the minimum ultimate tensil strength. After modification, piping stress levels will be acceptable for all accident conditions.

9. Corrective Action:

1. Grout removal or support modification will be performed as appropriate. (See attached summary)

2. A thorough review of potential piping penetration problems was performed as described in the description of the occurrence, Section 6.

Summary of Pipe Stresses For
LER 78-20
October 16, 1978

Item Number	Pipe Description	Nominal Pipe Diameter (Inches)	Type of Problem (1)	Planned Modification (2)
1	Charging Pump Common Suction from Volume Control Tank	8"	P	2 (3)
2	Reactor Coolant Pump Seal Water to Charging Pump Common Suction	4"	P	1
3	Residual Heat Removal Pump Discharge Instrument/Flush Line	3/4"	P	1
4	Containment Sump to Containment Spray Pump	14"	(6)	2
5	Hydrogen Ventilation Fan Suction Piping (2 penetrations)	8"	S	1
	Component Cooling Water Surge Lines to Surge Tanks (2 penetrations)	4"	S	1
7	Charging Pump Suction from Refueling Water Storage Tank (2 penetrations)	8"	S	1
8	Chemical and Volume Control System Letdown/ Recirculation Discharge to Hold Up Tanks A and C (2 penetrations)	4"	(4)	1 (5)
9	Evaporator Feed Ion Exchanger Suction	2"	P, S	1
10	Volume Control Tank Relief	4"	S	1
11	C Holdup Tank Gas Sample	3/8"	S	1
	Spent Resin Storage Tank Gas Sample	3/8"	P	1
13	Containment Ventilation Monitoring System	3/8"	S	1

NOTES:
(1) P means pipe stresses exceed ANSI B31.7 allowable limits.
S means support loads are excessive.
(2) 1 means support modifications are required.
2 means grout removal is required.
(3) Modification work is complete.
(4) Pipe stresses are satisfactory. Tank nozzle loading evaluation is not complete.
(5) Modification is dependent upon nozzle load evaluation.
(6) Pipe stress affects wall loading.