ENCLOSURE

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SALEM GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 BACKGROUND

On October 13, 1983 the licensee of Salem Generating Station submitted a report on the first inservice containment integrated leak rate test (CILRT) or Type A test for Salem Unit No. 2. The test was performed during the 24 hour period ending May 23, 1983, during the first refueling outage in compliance with Appendix J of 10 CFR Part 50 and Plant Technical Specification 4.6.1.2. It was pointed out, however, that some liner plate monitor channels were plugged shut during the inservice test. The licensee contended that, in spite of the fact that not all of the monitor channels were vented, the Type A tests can be conducted with the monitor channels either open or plugged shut and meet the requirements of Appendix J, 10 CFR Part 50. On November 8, 1984, a similar report was filed on the second inservice Type A test for Salem Unit No. 1 during the 24 hour period ending August 12, 1984, with the same contention that the test met the acceptance criteria of Appendix J and the Technical Specification.

The issue of leaving containment monitor channels plugged during CILRT for Salem Units 1 and 2 has been open for about 5 years. Since the containment monitor channels were not originally designed as part of the leaktight containment boundary, it should be demonstrated that they are capable of withstanding the containment design loading conditions and that the quality of channel welds are as good as the primary containment liner welds. On January 26, 1990 the licensee supplied additional information in response to NRC staff's questions to resolve this issue.

II. EVALUATION

The staff has reviewed the licensee's submittals (References 1-3) and the justification for plugging the containment monitor channels during a CILRT or Type A tests. It is the staff's position that the channels need not be vented and may remain plugged if the licensee can demonstrate that:

(a) the channel welds are qualitatively equivalent to or better than those for the primary containment liner welds,

(b) the channel would maintain their integrity when subjected to the loading conditions of a postulated design basis accident as well as during normal operation, and

(c) the inspection and reporting of tests are in accordance with the requirements of a visual inspection of the accessible interior and exterior surfaces of the containment structures and components performed prior to any Type A test.

The reactor containment structure is a reinforced concrete right cylinder with a flat base and a hemispherical dome. A welded steel liner with a minimum thickness of 1/4 inch is attached to the inside face of the concrete shell to ensure a high degree of leak tightness. The fabrication and erection of the reactor containment liner were performed by CB&I in accordance with Part UW, "Requirements for Unfired Pressure Vessel Fabricated by Welding", Section VIII of the ASME Boiler and Pressure Vessel Code, 1968 edition and PSE&G Detail Specification No. 68-7128. The qualification of all welders and welding procedures was performed in accordance with Part A, Section IX, of the ASME B&PV Code, 1968 edition. The weld electrode material used for the test channels was of ASME-SA233-Class E 6010, and that for plates - carbon steel to carbon steel - was of ASME-SA 233 Class E7018. This demonstrates that the material strength and quality of weld attaching the channels to the liner plate are comparable to those for the primary containment liner welds.

Dome:	Meridional	+ 13.0 to - 9.7
	Hoop	- 15.3 to - 14.6
Wall:	Meridional	+ 14.4 to - 27.7
	Hoop	+ 25.0 to - 6.9

The above calculated result is based on ground accelerations of 0.10 g for the design earthquake and 0.20 g for the Maximum earthquake.

The bending stresses in web of channels are summarized as follows (in ksi):

Under meridional stress	8.93
Under testing pressure	7.50
Combined	16.43
Under hoop stress	16.8
Under testing pressure	7.5
Combined	24.3
Hoop-meridional Resultant	19.0
Under testing pressure	7.5
Combined	26.5

The calculated stresses are well within the allowable stress as specified in the AISC Manual of Steel Construction.

The licensee committed to perform a visual inspection of the accessible interior and exterior surfaces of the containment structure and components prior to a Type A test as required by 10 CFR Part 50, Appendix J; and to emphasize that since the plugged monitor channels serve as a pressure retaining boundary, they should be considered as part of the interior surfaces of containment for the purposes of the pre-test inspection.

III. CONCLUSION

Based on the staff evaluation of licensee submittals and responses to request for additional information, the staff concludes that the licensee's proposal of plugging the containment monitor channels during the CILRT or Type A tests is acceptable since it meets all requirements for structural integrity and is consistent with our Branch position. We therefore consider that the issue of plugging the containment monitor channels during a CILRT or Type A test is resolved.

References

1. Letter from E. Liden of PSE&G to S. Varga of NRC, dated October 13, 1983. Subject: Salem Generating Station Unit No. 2 - Containment Integrated Leak Rate Test.

2. Letter from E. Liden of PSE&G to S. Varga of NRC, dated November 8, 1984. Subject: Salem Generating Station Unit No. 1 - Containment Integrated Leak Rate Test.

3. Letter from S. LaBruna of PSE&G to NRC, dated January 26, 1990. Subject: Salem Generating Station Units No. 1 and No. 2 - Response to RAI Containment Monitor Channels.

Dated: December 17, 1990

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