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

SAFETY EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO A REQUEST FOR RELIEF FROM INSERVICE TESTING REQUIREMENTS

PUMP RELIEF REQUEST NO. 6

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1

DOCKET NO. 50-206

INTRODUCTION

Southern California Edison Company (the licensee) is required by the Code of Federal Regulations, 10 CFR 50.55a(g), to perform inservice testing (IST) of components in accordance with the ASME Boiler and Pressure Vessel Code Section XI to the extent practical. 10 CFR 50.55a(g) also specifies the ASME Code classification requirements for older plants, such as San Onofre Unit 1. Components which are part of the reactor coolant pressure boundary and their supports shall meet the requirements applicable to components which are classified as ASME Code Class 1. Other safety-related pressure vessels, piping, pumps and valves shall meet the requirements applicable to components which are classified as ASME Code Class 2 or Class 3.

If the licensee determines that certain ASME Section XI Code requirements are impractical, the Code of Federal Regulations, 10 CFR 50.55a(g)(5), requires the licensee to submit information in support of that determination for NRC review. As allowed by 10 CFR 50.55a(g)(6), the NRC may grant relief from the code requirements and may impose alternative requirements that are determined to be authorized by law, will not endanger life or property or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. This Safety Evaluation Report (SER) contains the NRC staff findings with respect to granting or not granting relief from ASME Section XI Code requirements as part of the licensee's IST program.

The licensee's current IST program covers the third ten-year inspection interval from January 1, 1988 to January 1, 1998. The program is based on the requirements of Section XI of the ASME Code, 1983 Edition through the Summer of 1983 Addenda and remains in effect until January 1, 1998, unless the program is modified or changed prior to the ten year interval end date.

By letter dated November 30, 1989, the licensee provided its response to Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs." In its response, the licensee stated that it had revised its IST program to conform to the 11 positions stated in Attachment 1 of the GL. Therefore, as allowed by the GL, specific NRC approval of the licensee's IST program is not required. However, new relief requests and revisions to existing relief requests still require NRC review and approval if they are not addressed by the positions stated in Attachment 1 of GL 89-04.

As part of its response to GL 89-04, the licensee requested relief from IST requirements for certain components in accordance with the guidance provided by the GL. This Safety Evaluation specifically addresses the licensee's request for relief associated with auxiliary feedwater pumps G-10 and G-10S (PRR No. 6). We did not evaluate the licensee's request for relief associated with the safety injection and refueling water pumps in this Safety Evaluation. As we discussed with members of the licensee's staff in a telephone conversation on April 12, 1990, we do not believe that miniflow testing of the safety injection and refueling water pumps will provide meaningful flow data. The licensee agreed to evaluate the possibility of performing full flow testing of these pumps at some reduced frequency as an alternative to the ASME Section XI Code requirements. Therefore, we do not consider it appropriate to evaluate the licensee's request for relief associated with the safety injection pumps and the refueling water pumps at this time.

Relief Request

By letter dated November 30, 1989, the licensee requested relief from measuring pump flow rate every three months as required by Section XI, Article IWP-3000, for the motor driven and steam driven auxiliary feedwater pumps, G-10 and G-10S. The following alternative testing was proposed by the licensee:

> "Test the AFW pumps at each Mode 5 outage of greater than 30 days duration, unless the pump has been tested in the previous 18 months. These tests may also be conducted in the associated Mode 3 or Mode 4 and may be conducted either independently or as part of the tests required by TS 4.1.9(D). At each test measure, record and trend flow rate and differential pressure at rated speed. In addition, test these pumps in accordance with ASME Code Section XI (except for the measurement of flow rate). If some time in the future flow indication is provided on the miniflow lines, then this alternate testing will be replaced by the ASME Code Section XI requirements."

Licensee's Basis for Requesting Relief

"The recirculation or miniflow loop and the normal pump discharge path do not have flow meters. The only available flow path to take measurements of the pump flow rate is the emergency discharge path, which has a flowmeter.

ASME Code Section XI (1983 Edition) requires that pump flow rate be measured every quarter during normal plant operation. The AFW pumps are tested on miniflow monthly instead of quarterly; however, due to the absence of a flowmeter in the miniflow loop, the flow rate cannot be measured.

The AFW pumps should not be subjected to frequent (monthly or quarterly) flow testing in the emergency mode during normal plant operation due to the increased potential for causing thermal shock to the AFW to main FW transition nozzle and the steam generator nozzles.

Technical Specification (TS) 4.1.9(D) requires that both AFW pumps be tested on emergency flow under certain plant shutdown conditions, as part of periodic system reliability testing for the auxiliary feedwater system. The motor driven AFW pump is required to be tested when the reactor coolant system (RCS) pressure remains less than 500 psig for a period greater than thirty days. Typically, this test is conducted during cold shutdown (Mode 5). The turbine driven AFW pump is required to be tested within 72 hours after entering Mode 3 from the RCS pressure conditions described above. Typically, this test is conducted in Mode 3. In both cases, the test includes a verification that the AFW pumps are able to deliver a measured flow of at least 165 gpm to the steam generators. The three parameters of interest in determining hydraulic performance are rotative speed, flow rate and differential pressure. Since both pumps are constant speed pumps and each pump is tested at the same rated speed, by measuring differential pressure concurrently with flow rate once every 18 months, either as part of the TS required test or as an independent test in Modes 3, 4 and 5, and recording and trending this information, the intent of the ASME Code Section XI is satisfied."

EVALUATION

Position 9 of Attachment 1 to Generic Letter 89-04 states the following NRC staff position:

"In cases where flow can only be established through a non-instrumented minimum-flow path during quarterly pump testing and a path exists at cold shutdowns or refueling outages to

perform a test of the pump under full or substantial flow conditions, the staff has determined that the increased interval is an acceptable alternative to the Code requirements provided that pump differential pressure, flow rate, and bearing vibration measurements are taken during this testing and that quarterly testing also measuring at least pump differential pressure and vibration is continued. Data from both of these testing frequencies should be trended as required by IWP-6000. Since the above position is a deviation from the Code required testing, it should be documented in the IST program."

It is therefore acceptable for the licensee to conduct full flow testing of the auxiliary feedwater pumps less often than quarterly. However, it was not the intent of GL 89-04 to allow reduced frequency testing if the plant is in a condition that would allow quarterly testing to be performed. Therefore, full flow testing of auxiliary feedwater pumps G-10 and G-10S should be conducted during each Mode 3, 4 or 5 entry following power operation unless full flow testing has been performed during the previous 90 day period. Otherwise, these pumps should be tested in accordance with ASME Section XI Code requirements except for the measurement of flow rate.

As we stated previously, we do not believe that pump miniflow testing would provide meaningful flow data and this method of testing should not be used in the future to replace full flow testing.

CONCLUSION

Based on the foregoing evaluation, the NRC staff has determined that, pursuant to 10 CFR 50.55a(g)(6), the ASME Section XI Code requirements are impractical for auxiliary feedwater pumps G-10 and G-10S and relief may be granted subject to the conditions described in this evaluation. This relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden placed upon the licensee if the requirements were imposed on the facility.

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Dated: May 18, 1990