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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
In-Service Testing Program for Pumps and Valves
San Onofre Nuclear Generating Station
Unit 1

Reference: Letter from M. O. Medford (SCE) to G. E. Lear (NRC), dated
July 3, 1986, In-Service Testing Program for Pumps and Valves

This letter is regarding the ASME Code Section XI In-Service Testing (IST) requirements for the safety injection (SI) pumps, the refueling water (RW) pumps and the auxiliary feedwater (AFW) pumps at the San Onofre Nuclear Generating Station, Unit 1.

By the above referenced letter, Southern California Edison (SCE) submitted a revised request for relief from measurement of flow rate for the above pumps, noting that there is no flow instrumentation installed in the test loops (miniflow lines) of these pumps. For the AFW pumps, Revision 1 to Pump Relief Request No. 6 proposed measurement of pump flow rate and pump differential pressure at "cold shutdown intervals" in lieu of monthly flow rate measurements, but it did not specify a minimum frequency for taking these alternate measurements. For the SI and RW pumps, Revision 1 included a commitment to install instrumentation so that readings of differential pressure across existing orifices in the miniflow lines could be taken and then used to calculate and trend the pump flow rate. These modifications were to be completed by the end of the next refueling outage.

On June 18, 1987, SCE met with representatives from the NRC's In-Service and Testing Assessment Section (Mechanical Engineering Branch) to discuss various issues associated with the IST program. During these discussions, we described operational and safety related problems associated with frequent testing of the AFW pumps and also expressed reservations concerning the usefulness of the proposed modifications for the SI and RW pumps. The NRC representatives suggested that we formally submit a request for reconsideration, based on appropriate justification.

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Enclosed for your review is Revision 2 to Pump Relief Request No. 6, which provides the basis for our reservations concerning the proposed modifications for the SI and RW pumps and, in addition, clarifies that alternate cold shutdown interval testing of the AFW pumps will be performed once every 18 months. Consistent with this request for reconsideration and until your further direction, we are suspending the design, engineering and procurement work related to the proposed modifications for the SI and RW pumps.

If you have any questions or comments regarding this submittal, please let me know as soon as possible.

Very truly yours,



Enclosure

cc: R. F. Dudley, NRR Project Manager, San Onofre Unit 1
J. B. Martin, Regional Administrator, NRC Region V
F. R. Huey, NRC Senior Resident Inspector, San Onofre Units 1, 2 and 3

PUMP RELIEF REQUEST NO. 6

SYSTEMS: Safety Injection (SI), Refueling Water (RW) and Auxiliary Feedwater (AFW) Systems

COMPONENTS: SI Pumps G-50A and G-50B, RW Pumps G-27N and G-27S, and AFW Pumps G-10 and G-10S

CLASS: 2

SAFETY FUNCTION:

SI Pumps: To provide low pressure borated water from the refueling water storage tank to the suction of the main feed pumps, when operating in the SI mode.

RW Pumps: To provide low pressure borated water from the refueling water storage tank to the containment spray nozzles in the event of a loss of coolant accident.

AFW Pumps: To provide feedwater to the steam generators during normal plant startup and shutdown and during accident conditions which result in loss of main feedwater.

TEST REQUIREMENT: Article IWP-3000 of ASME Code Section XI, requires pump flow rate to be measured as part of periodic In-Service Testing during normal plant operation.

BASIS FOR RELIEF:

SI&RW Pumps: The only available flow paths for periodic testing of these pumps during normal power operation (Modes 1 and 2) are the recirculation or miniflow lines designed to provide the required minimum flow for pump cooling. These lines have been designed for fixed resistance with no flow measuring instrumentation installed. The miniflow quantities are quite small (less than 10% of the rated flow in each case) and the pump is operating close to its shutoff head on the performance curve. Under these conditions, the pump miniflow rate has minimal significance compared with the total pump head for the purpose of indicating pump performance.

Should a deviation in the measured value of the pump head fall within the Required Action Range of Section XI of the ASME Code, the pump is required to be declared inoperable and not returned to service until the cause of the deviation has been determined and the condition corrected. This corrective action may include inspection of the orifices in the pump miniflow lines for wear and replacement of worn orifices. In this way, the hydraulic resistance of the test loop is maintained constant.

It is also not practical to test the SI and the RW pumps in Modes 3, 4, and 5 using their normal discharge paths as this would inject radioactively contaminated refueling water into the main feedwater system and the containment spray nozzles.

Technical Specification 4.2.1.II requires that the SI pumps be tested at least once per month when the reactor is critical and the RW pumps be tested at least once per month whenever the reactor coolant system temperature is above 200°F to verify that the SI and RW pumps are in satisfactory running order. These tests consist of verifying that the SI pumps reach and maintain 95% of their rated shutoff head within 10 seconds after starting and the RW pumps maintain 90% of their rated shutoff head. These component tests are in addition to those required by Section XI of the ASME Code.

The results of In-Service Testing for the SI and RW pumps over a number of years (since at least 1982) indicate highly reliable performance.

AFW Pumps

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 (Winter 1979 Addenda) 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 or 5, and recording and trending this information, the intent of the ASME Code Section XI is satisfied.

ALTERNATE TESTING: Test the SI and RW pumps in accordance with Technical Specification 4.2.1.II and ASME Code Section XI (except for the measurement of flow rate).

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.

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