



*Southern California Edison Company*

23 PARKER STREET  
IRVINE, CALIFORNIA 92718

R. M. ROSENBLUM  
MANAGER OF  
NUCLEAR REGULATORY AFFAIRS

TELEPHONE  
(714) 454-4505

October 4, 1991

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

Gentlemen:

Subject: **Docket No. 50-206**  
**Auxiliary Feedwater System Surveillance Testing**  
**San Onofre Nuclear Generating Station Unit 1**

Your letter dated November 15, 1990, issuing Amendment No. 138, requested that we propose changes to our Technical Specification 4.1.9, "Auxiliary Feedwater System Surveillance." The letter indicated the surveillance requirements for determining operability of the turbine driven Auxiliary Feedwater (AFW) pump may be out of date. You also recommended that more extensive testing be performed upon entry into MODE 1 to demonstrate operability of the turbine driven AFW pump since secondary plant conditions are more suitable for pump turbine operation.

We have reviewed our Technical Specification requirements and have determined that the MODE 1 testing of the turbine driven AFW Pump G-10 required by our Inservice Test (IST) Program following every MODE 3, 4, or 5 shutdown satisfies your request. This testing ensures the operability of the turbine pump. Based on this review we have determined that testing of the turbine pump is up to date, therefore Technical Specification 4.1.9 does not require a revision. Notwithstanding, we are proposing a revision to the Basis to Technical Specification 4.1.9 to explain the testing that is performed as part of our IST program. The revised Basis is enclosed for your review and approval.

BACKGROUND

During the Cycle 11 refueling outage, the AFW flow venturis were replaced with smaller diameter venturis. This was done to reduce the maximum AFW flow to less than 150 gpm per steam generator. The reduced maximum flow was needed to minimize the probability of a water hammer event. Technical Specification 3.4.3 was revised to reflect the reduced AFW flow values in Amendment Application No. 185, dated August 22, 1990. As part of the change, we needed to verify operability of the system. In our application we discussed the startup testing to be performed, including full flow testing, for the AFW pumps. G-10S and G-10W were tested in MODE 5 following return from the

9110100082 911004  
PDR ADOCK 05000206  
P PIR

A001  
4/1

Cycle 11 refueling outage, and G-10 was tested in MODE 1 at 20% power. The modification, technical specification revision, and testing were approved by NRC Amendment No. 138, dated November 15, 1990.

#### IST PROGRAM

The AFW System consists of two independent and redundant trains. Train A includes the turbine driven AFW pump (G-10) and a motor driven AFW pump (G-10S). Train B includes motor driven AFW pump (G-10W). The AFW pumps are classified as Safety Related and are under the ASME Boiler and Pressure Vessel Code Section XI IST Program. Under the SONGS IST program during normal power operation AFW pump G-10W is substantial flow tested and AFW pumps G-10 and G-10S are tested on minimum flow (pump recirculation flow).

Testing the pumps on minimum flow is allowed by Pump Relief Request No. 6, Revision 3 which was approved by your letter dated May 18, 1990. The only installed flow measuring devices for G-10 and G-10S are in the emergency discharge paths. Using the emergency flow paths for full flow testing during normal plant operation would inject subcooled AFW water into the Main Feedwater (MFW) lines to the steam generators. This cold AFW water would increase the potential for thermal shock to the AFW to MFW transition nozzles and the steam generator nozzles. Because of this increased potential for thermal shock, during normal power operation, pumps G-10 and G-10S are tested on minimum flow only. This testing measures pump suction and discharge pressures, pump speeds, and bearing vibration. To measure full flow and meet the IST requirements as specifically relieved by PRR No. 6, Revision 3, both pumps were tested during the return to service from every MODE 5 shutdown using the emergency flow path. Pump G-10S was tested in MODE 5, and G-10 was tested in MODE 3.

#### SUBSEQUENT PUMP RELIEF REQUEST

As a result of discussions with the NRC during the review cycle for Amendment Application No. 185 and the NRC letter dated November 15, 1990, issuing Amendment No. 138, we decided to revise the AFW testing requirements in the IST Program. The revision was submitted as Pump Relief Request No. 6, Revision 4, dated January 3, 1991. This revision requested relief from testing pump G-10 in MODE 3, 4, or 5. The relief request proposed full flow testing of the turbine driven AFW pump, G-10 in MODE 1 following any MODE 3, 4, or 5 shutdown, unless tested in the previous 92 days. The full flow testing will be conducted at 20% power when the secondary plant is better able to withstand the transients of the cold AFW water entering the steam generators.

On January 24, 1991 you approved PRR No. 6, revision 4. This approval concurred with 20% power being an appropriate condition for the pump test. The letter stated that the currently proposed changes fall within the scope of the safety evaluation report dated May 18, 1990 and the general guidance for IST programs.

CONCLUSION

We have determined that our IST program, as required by Technical Specification 4.1.9.A, satisfies the request in your letter issuing Amendment No. 138. Technical Specification 4.1.9.A states:

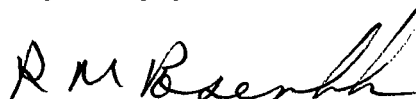
Each auxiliary feedwater pump shall be demonstrated OPERABLE by testing each pump in accordance with Section XI of the ASME Boiler and Pressure Vessel code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i).

Technical Specification 4.1.9.A requires AFW pump operability to be demonstrated by the IST Program testing. The IST Program in accordance with Pump Relief Request No. 6 require testing the turbine driven auxiliary feedwater pump in MODE 1 at 20% power following every MODE 3, 4, or 5 shutdown, unless performed in the previous 92 days. This satisfies the NRC's concern identified in the November 15, 1990 letter. Therefore, no further action is required concerning auxiliary feedwater surveillance testing or revising Technical Specification 4.1.9.

In order to clarify the testing that is performed on the AFW pumps, particularly the turbine pump, we have expanded the Basis Section of Technical Specification 4.1.9 to include an explanation of the IST testing. The revised Basis is included as an enclosure to this letter for your review and approval.

If you have any questions, please contact me.

Very truly yours,



Enclosure

cc: J. B. Martin, Regional Administrator, NRC Region V  
George Kalman, NRC Senior Project Manager, San Onofre Unit 1  
J. O. Bradfute, NRC Project Manager, San Onofre Unit 1  
C. W. Caldwell, NRC Senior Resident Inspector, San Onofre Units 1, 2&3

#### 4.1.9 AUXILIARY FEEDWATER SYSTEM SURVEILLANCE

- APPLICABILITY: Applies to the auxiliary feedwater pumps and valves for MODES 1, 2, and 3.
- OBJECTIVE: To ensure the reliability of the auxiliary feedwater system.
- SPECIFICATION:
- A. Each auxiliary feedwater pump shall be demonstrated OPERABLE by testing each pump in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i).
  - B. At least once per 31 days an inspection shall be made to verify that each non-automatic valve in the emergency flow path that is not locked, sealed, or otherwise secured in position is in its correct position.
  - C. Each auxiliary feedwater Train shall be demonstrated OPERABLE at least once per 18 months by:
    1. Verifying that the AFW Train B pump starts as designed automatically upon receipt of an auxiliary feedwater actuation test signal.
    2. Verifying that AFW Train A motor driven pump starts as designed automatically upon receipt of auxiliary feedwater actuation AND Train B low flow test signals. Subsequently, verify the pump stops upon receipt of a Train B positive flow test signal.
    3. Within 72 hours after entering MODE 3, verifying that the AFW Train A steam driven pump enters warm-up mode upon receipt of an auxiliary feedwater actuation test signal. Subsequently, verify pump starts upon receipt of a Train B low flow test signal, and returns to warm-up mode upon receipt of Train B positive flow test signal.
    4. Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of actuation test signals.
  - D. When the reactor coolant system pressure remains less than 500 psig for a period longer than thirty (30) days, flow tests shall be performed to verify the emergency flow paths from the auxiliary feedwater storage tank to each steam generator, using each motor driven auxiliary feedwater pump prior to increasing reactor coolant system

pressure above 500 psig. The flow tests shall be conducted with the auxiliary feedwater system valves in their emergency alignment. Within 72 hours after entering MODE 3, the steam driven auxiliary pump shall be similarly tested.

- E. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 for the steam driven auxiliary feedwater pump. However, the steam driven AFW pump must be OPERABLE in all other respects.

BASIS:

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of offsite power.

The design of the auxiliary feedwater system further ensures sufficient AFW flow into the intact feedwater lines without exceeding pump run-out or water hammer limits for any applicable design basis event with or without concurrent loss of offsite power and a single active failure.<sup>(2,3)</sup>

Specification 4.1.9.A demonstrates the operability of the AFW pumps by testing requirements of the Section XI IST program.<sup>(4)</sup> During normal power operation, pump G-10W is substantial flow tested and pumps G-10 and G-10S are tested on minimum flow. During this test differential pressure, pump speeds, and bearing vibration are measured for all 3 pumps. Pump discharge flow is measured for AFW pump G-10W. At each return from a MODE 3, 4, or 5 shutdown following power operations, pumps G-10 and G-10S are full flow tested unless tested in the previous 92 days. G-10S is tested prior to MODE 3. G-10 is tested in MODE 1 at about 20% power.

REFERENCES:

- (1) NRC letter dated July 2, 1980 from D. G. Eisenhut to all pressurized water reactor licensees.
- (2) SCE letter dated November 6, 1987, from M. O. Medford to NRC Document Control Desk.
- (3) SCE letter dated November 20, 1987, from M. O. Medford to NRC Document Control Desk.
- (4) SCE letter dated January 3, 1991, from F. R. Nandy to NRC Document Control Desk.