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SUBJECT: Documents controls placed on spent fuel pool cooling at plant.

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May 11, 1990

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

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
Spent Fuel Pool Cooling
San Onofre Nuclear Generating Station
Units 2 and 3

This letter documents the controls placed on spent fuel pool (SFP) cooling at San Onofre Units 2 and 3. This is considered appropriate since the San Onofre Units 2 and 3 Technical Specifications do not address the SFP cooling system.

Design Description

As described in UFSAR Section 9.1.3, the SFP cooling system consists of 2 pumps, each powered from the class 1E electrical system, and two heat exchangers. The heat exchangers are cooled by the non-critical loop of the Component Cooling Water (CCW) system. The non-critical loop cooling water is supplied by either of two trains of CCW. Each train of CCW is supplied by an independent train of Salt Water Cooling (SWC) which transfers heat to the ultimate heat sink, the Pacific Ocean.

The SFP cooling system is designed to maintain the spent fuel pool temperature at or below 140°F with 1 train of the SFP cooling system running during normal and refueling operations. During a full core offload and a full SFP, both SFP cooling pumps and heat exchangers are required to maintain the water temperature at or below 140°F. UFSAR Section 9.1.3.3 states:

"It is highly improbable that all cooling would be lost to the spent fuel storage pool since one train of the twin parallel, cross-connected cooling trains is expendable during all normal operating and refueling conditions."

'Section 3.3.2.4 of the Spent Fuel Pool Reracking Licensing Report changes the system's requirements. For the increased SFP capacity, when the normal heat load is reached, 1 pump and 2 heat exchangers will be required to maintain the SFP temperature at or below 140°F. During a complete core offload, the abnormal heat load will require 2 pumps and 2 heat exchangers to maintain SFP temperature below 156°F.

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The NRC's Safety Evaluation Report (NUREG 0712) documented that the SFP cooling system meets the redundancy requirements of General Design Criterion (GDC) 44. During normal operations (Modes 1 through 4) San Onofre Units 2 and 3 have two complete trains of SFP cooling from the SFP to the heat sink (the Pacific Ocean). Both trains of SFP cooling, CCW, and SWC have normal and emergency power supplies provided. With both trains operable GDC 44 is satisfied explicitly.

Technical Specifications

There is no Technical Specification which addresses the SFP cooling system and allowable outages of equipment for service and maintenance. The only Technical Specification on the SFP is 3/4.9.11. This specification requires at least 23 feet of water over the top of irradiated fuel assemblies in the storage racks.

To establish appropriate administrative controls for the components of the SFP cooling system and the other supporting systems, we have used the corresponding requirements for the fuel in the reactor with the head off in Mode 6 as a model. Technical Specification 3/4.9.8.1 requires one shutdown cooling train to be operable and in operation when the water level above the top of the reactor vessel flange is greater than or equal to 23 feet. As indicated in the basis for this Technical Specification:

"The requirement to have two shutdown cooling trains OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single active failure of the operating shutdown cooling loop will not result in a complete loss of decay heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core."

Administrative Controls

In the absence of explicit Technical Specifications on the SFP cooling system, Southern California Edison (SCE) will administratively control the system consistent with the comparable requirements of Technical Specification 3/4.9.8.1. The water level above the fuel will always be maintained greater than or equal to 23 feet as required by Technical Specification 3/4.9.11. In addition, at least one of the two SFP cooling systems will be operable, including one complete train of cooling from the SFP to the Pacific Ocean. (Following reracking and when needed to maintain SFP temperatures at or below 140°F, two SFP heat exchangers will be maintained operable except as described below in the three required actions.) During a complete core offload, both SFP cooling pumps and heat exchangers will normally be operable; however, only one train of CCW and SWC, and one diesel generator will be required to be operable.



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Required Actions

Required actions associated with the SFP cooling system operability will be as follows:

1. One train of SFP cooling from the SFP to the Pacific Ocean will be operable. The other train of SFP cooling may be removed from service for short periods of time (less than about 72 hours) for planned equipment outages, such as maintenance, provided it is determined the SFP temperature will remain below 140°F for the duration of the outage.
2. With less than the required SFP cooling train(s) operable, except for the short periods of time described in 1. above, immediately initiate corrective action to return the required cooling trains to operable status.
3. With no SFP cooling train operable, immediately place any fuel element in a safe position and suspend fuel movement until cooling is restored.

SCE considers these administrative controls prudent since the conditions in the SFP are similar to the conditions in the reactor cavity when only one shutdown cooling train is required to be in operation. Therefore, as with the shutdown cooling system, we are ensuring that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the SFP at or below 140°F as required, and (2) a large volume of water is maintained over the fuel in the SFP, providing a heat sink which allows ample time to restore decay heat removal, in the event it is interrupted, prior to boiling the pool.

In addition, backup cooling for the SFP is available from a cross connect between the Units so that the Unit 2 CCW system can be used to cool the Unit 3 SFP cooling system and Unit 3 CCW can cool the Unit 2 SFP cooling system. If we plan to implement this alignment to completely secure CCW at either unit, we will submit a license amendment request for NRC review and approval for use of this cross connect.

If you have any questions, or need additional information, please let me know.

Very truly yours,

A handwritten signature in black ink, appearing to be 'J. B. Martin', is located below the 'Very truly yours,' text. The signature is fluid and cursive.

cc: J. B. Martin, Regional Administrator, NRC Region V
C. Caldwell, NRC Senior Resident Inspector, San Onofre Units 1, 2, and 3