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February 23, 1989

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

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
LTOP Analysis
San Onofre Nuclear Generating Station
Units 2 and 3

By letter dated December 29, 1988, SCE transmitted the results of the first Unit 2 surveillance capsule materials test to the NRC. This letter also transmitted two calculations (N-0220-019, "SONGS 2 RCS Pressure Temperature Curves for 10 EFPY" and N-0220-020, "SONGS 2 and 3 Reactor Vessel Adjusted Reference Temperature for 10 EFPY and 32 EFPY") in support of proposed Technical Specification Change 278 that would update the PT curves for San Onofre Unit 2. The updated PT curves are required to be approved by the NRC prior to operation beyond 4 EFPY, currently calculated for April 14, 1989. The NRC project manager (D. Hickman) informed SCE that the NRC Technical Reviewer needed additional information prior to approving SCE's updated PT curves (PCN-278). Specifically, the NRC was concerned that the original Low Temperature Overpressurization (LTOP) transient analysis was still bounding for all transients. This concern arose because the Adjusted Reference Temperature causes a corresponding shift in the RCS temperature used for the LTOP analysis. The NRC wanted confirmation that the new RCS LTOP temperature is bounded by the original RCS LTOP transient analysis. If it is not, the NRC requested that SCE provide a new LTOP transient analysis.

SCE researched the original LTOP analysis performed by Combustion Engineering (CE) and found that, as indicated on FSAR Figure 5.6-7, the two limiting pressure transients for the shutdown cooling system (SDCS) are (1) mass addition (three charging pumps and two HPSI's) and (2) RCP start energy addition transient.

For the mass addition transient, the LTOP relief valve was sized by C-E to accommodate this transient for shutdown cooling system temperatures from 120°F to 400°F (SDCS design temperature) and assuming a 417 psia relief valve setpoint. Therefore, the change in the LTOP alignment temperature from 235°F to 312°F is still bounded by the original relief valve sizing calculation.

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For the energy addition transient, the original LTOP analysis assumed that one RCP was started with a maximum allowed differential temperature (ΔT) of 100°F between the the primary and secondary systems. It is San Onofre's practice to cool down with RCP's until the steam generators are at least below 220°F. Thus, with steam generators at 220°F the maximum ΔT would occur with the RCS at 120°F. This is not the most limiting case. The most limiting energy addition transient would be with the secondary side at 350°F (SDCS maximum alignment temperature) and the primary side at 250°F. This condition provides the highest system energy and maximum allowed ΔT . However, this condition is prevented from occurring through administrative controls and plant operating procedures. Procedurally, the maximum required ΔT is 20°. A normal plant cooldown is always performed using two RCP's until the primary side is at or below 140°F with the secondary side of the steam generators reverse cooled with the RCP's through the shutdown cooling system.

Changing the temperature at which LTOP must be aligned from 235°F to 312°F would not change the initial conditions of the most limiting energy addition transient. The energy addition transient is driven by the ΔT between the primary side and secondary side rather than RCS internal energy (starting temperature). For a primary side temperature of 312°F and the maximum allowed secondary temperature of 350°F, the ΔT would be reduced from 100°F to 38°F (350°F-312°F) thus reducing the severity of the pressure transient.

Therefore, changing the LTOP alignment temperature from 235°F to 312°F would not increase the maximum allowed energy addition pressure transient from that currently allowed. Procedurally, this transient will be limited even further by restricting the maximum ΔT to 20°F and running 2 RCP's to reverse cool the steam generators during plant shutdowns.

SCE requests that the NRC complete their review of PCN-278 expeditiously. As indicated above, April 14, 1989 is the latest calculated date for NRC approval to preclude unnecessary plant shutdown.

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

Very truly yours,



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