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SUBJECT: Clarifies util 870918 response to Questions 5 & 8 to Generic Ltr 87-17. Listed responses to questions reflect bounding/nominal Mode 5 mid-loop operations.

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December 23, 1987

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

Gentlemen:

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

The Southern California Edison (SCE) Company's letter dated September 18, 1987 provided SCE's response to NRC Generic Letter 87-12 for San Onofre Nuclear Generating Station Units 2 and 3 (SONGS 2/3). In the responses to questions 5 and 8, SCE made specific statements relating to the size of hot leg vents and cold leg temperatures maintained during Mode 5 mid-loop operation in relation to the evaluation of a loss of shutdown cooling in this condition. These statements are bounding for the decay heat load expected at the earliest time at which mid-loop operation could be established following shutdown. However, these statements could be misconstrued to be absolute requirements without further consideration of the existing decay heat load, even though both the size of vent required to limit RCS pressurization and the time to bulk boiling in the event of a loss of shutdown cooling are functions of the actual decay heat load. During the Unit 2 refueling outage SCE desired to maintain a smaller vent than that indicated in the Generic Letter 87-12 response. SCE discussed this with the Resident Inspector prior to proceeding and committed to provide a clarification of SCE's Generic Letter 87-12 response. This letter clarifies SCE's responses to questions 5 and 8.

The following statement in response to Question 5 addresses the use of a hot side vent during mid-loop operations to mitigate and extend loss of shutdown cooling:

> "To avoid the potential consequences of extended loss of SDCS flow while in this plant configuration, procedures require a hot side vent (pressurizer or hot leg SG manway) to prevent RCS pressurization and hot leg HPSI injection availability for additional assurance that RCS makeup gets to the RV."

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SCE had performed an engineering evaluation of the use of a hot side vent in support of the SONGS 2 refueling outage prior to the submittal of the generic letter response and had developed a detailed guidance to support mid-loop operations. The procedures indicated that RCS pressurization is a function of decay heat level and vent size. The first mid-loop evolution during the refueling outage occurred five (5) days after plant shutdown. The procedures specified that the pressurizer manway vent (10" diameter surge line) would limit RCS pressure to 1-2 psig. The second mid-loop evolution was scheduled to take place 38 days after plant shutdown. The procedure specified that a small vent with an equivalent diameter of 4" would limit RCS pressure to about 6 psig. These RCS pressures are considered sufficiently low to prevent unacceptable consequences for an extended loss of shutdown cooling event. Therefore, although procedures specified that a vent be provided which was bounded by SCE's engineering evaluation, SCE's Generic Letter 87-12 response conservatively specified that a pressurizer or steam generator manway would be used as a vent.

With regard to the RCS temperature during Mode 5 operations with the RCS partially filled, SCE's response to Generic Letter 87-12, Question 8 stated:

> "During partially filled operations, SDCS flow is reduced to between 2300 and 2500 gpm; RCS temperature is maintained <u>below</u> 140°F; ..... and the RCS eductor is placed in service to remove radioactive gas from voids within the RCS and reduce airborne activity inside containment."

SCE experienced an RCS temperature of 145°F during Mode 5 operations with the RCS partially filled. This deviation is not a significant departure from our procedural requirement that the RCS temperature be maintained less than 140°F while in Mode 5 at mid-loop.

Our response to Question 5 of the referenced submittal indicated that time to bulk boiling following a loss of shutdown cooling was about 23-47 minutes for plant shutdown of 5-50 days. The times to bulk boiling were based on an initial RCS temperature of 120°F which is the nominal RCS temperature during mid-loop operations. For initial RCS temperatures different from 120°F, Abnormal Operating Instruction SO23-13-15, "Loss of Shutdown Cooling," provides a method for determining time to boil. Attachment 3 of this procedure provides a table of core heatup rate versus time after plant shutdown. Time to boil is determined by dividing the temperature difference between the initial RCS temperature and 212°F by the core heatup rate. A mid-loop operation at 145°F after the second draindown at approximately 35 days into the outage would not result in bulk boiling within 29 minutes following a loss of shutdown cooling. This result is well within the range of time to bulk boiling covered by the analysis discussed in the response to Question 5.

In conclusion, SCE's response to Generic Letter 87-12 Questions 5 and 8 reflect bounding/nominal Mode 5 mid-loop operations. Deviations from the presented bounding/nominal conditions were carefully considered and detailed procedural guidance is based on analysis considering the decrease of decay heat load with time.

Should you have any questions regarding this information, please call me.

Very truly yours,

M. O. Medford

cc: H. Rood, NRR Senior Project Manager, San Onofre Units 2 and 3
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