

50-312/77-18

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SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

December 8, 1977

Director of Regulatory Operations
ATTN: Mr. R. H. Engelken
NRC Operations Office, Region V
1990 North California Boulevard
Walnut Creek Plaza, Suite 202
Walnut Creek, California 94596

Re: Operating License DPR-54
Docket No. 50-312
Reportable Occurrence 77-18



Dear Mr. Engelken:

In accordance with Technical Specifications for Rancho Seco Nuclear Generating Station, Section 6.9.1, and Regulatory Guide 1.16, Revision 4, Section C.2.a(2), the Sacramento Municipal Utility District is hereby submitting this followup report to Reportable Occurrence 77-18.

A return to power was being made on November 17-18 following a 2-hour shutdown due to excessive unidentified RCS leakage. During that shutdown, power was reduced by slowly inserting the controlling rod group (group 7) over a period of several hours. This method of control was proper for the type of shutdown; however it resulted in a significant positive imbalance when the power level reached approximately 20 percent on the subsequent startup. The group 7 position at this time was almost completely withdrawn. As power increased due to boron dilution and xenon burnout, group 7 was inserted automatically to control power level. This corrected the positive imbalance and in fact created a large negative imbalance. This negative imbalance became large enough that at 0026 on November 18, a computer alarm was received indicating an out-of-specification condition for imbalance at the current power level. This meant that the reactor was being operated in the restricted region of Technical Specifications figure 3.5.2-5, a condition that was permissible for a 2-hour period. If the condition was not corrected within that period, power had to be reduced until the limits were met.

The operators initiated corrective action by batch additions of boric acid. The intent of this action was to add sufficient boric acid to cause group 7 to be withdrawn, removing the imbalance condition. Addition of larger amounts of boric acid was not done to prevent return to the positive imbalance condition experienced earlier. The result of these actions was a stabilization of the reactor at about 90 percent full power and -17 percent imbalance, with group 7 at approximately 65 percent withdrawn. At 0102 an alarm was received indicating that the rod index limit established by Figure 3.5.2-1 was also exceeded. The corrective action was not sufficient to overcome the effects of xenon burnout, so these conditions remained stable for nearly five hours.

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Power was not reduced after the two-hour time limit was reached because the operators recognized that insertion of the controlling group would only aggravate the existing conditions, placing the reactor in a less conservative position and ultimately leading to a reactor trip. At 0556 the imbalance returned within specification, and at 0920 the boration was sufficient to withdraw group 7 beyond the rod index limit. Power level did not vary significantly during this period.

The problem of greatest concern in this incident was the failure of the operators to take the action required by Technical Specifications when the 2-hour time limit was reached. The Plant Superintendent has issued a directive reiterating the need for compliance, even if a plant shutdown results from the directed actions. A second area of concern is the apparent inadequacy in operator training as shown by the generation of the out-of-specification condition and by the inability to cope with that condition. After-the-fact analysis reveals that the proper corrective action to facilitate return to the permissible operating region was the continuous addition of boric acid. Group 7 rods would have automatically withdrawn to maintain power, and imbalance for the existing conditions would have been minimized. If group 7 rods fully withdrew without reducing imbalance to an acceptable operating region, continued boron addition would have reduced power to levels where operational imbalance limits are less restrictive. Such a power reduction is preferable to continued operation in the restricted region. To prevent this situation from recurring, the proper method of power ascension would correct the xenon oscillation problems before power goes above 50 percent. With these problems resolved, power could then be raised by xenon burnout and boron concentration control without significant movement of the controlling group.

A training session covering these preferred operating methods will be given to plant management personnel and all licensed operators prior to December 31, 1977. As an interim measure, operators have been directed that power is not to be increased above 50 percent unless group 7 is greater than 85 percent withdrawn and imbalance is stable at 0 ± 8 percent. These provisions remain in effect until the training is completed.

Respectfully submitted,

Wm. C. Walbridge
General Manager

JJM:FTE:jim

cs: Director, MIPC (3)
Director, IE (30)