

*Southern California Edison Company*



P.O. BOX 800  
2244 WALNUT GROVE AVENUE  
ROSEMEAD, CALIFORNIA 91770

October 3, 1980



U. S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Region V  
1990 North California Boulevard  
Suite 202, Walnut Creek Plaza  
Walnut Creek, California 94596

Attention: Mr. R. H. Engelken, Director

DOCKET No. 50-206  
SAN ONOFRE - UNIT 1

Dear Sir:

Reference: Letter dated September 22, 1980 from SCE (J. M. Curran)  
to NRC (R. H. Engelken)

The reference letter provided prompt written notification to your office of an inadvertent dilution of the Reactor Coolant System. This letter constitutes a follow-up report submitted in accordance with the reporting provisions of Section 6.9.2.a of Appendix A to the Provisional Operating License DPR-13.

On September 22, 1980 work was underway to decontaminate the steam generator channel heads in order to minimize man-rem exposure during the steam generator sleeving repair program. The decontamination process uses a high pressure water/grit spray to remove the oxide layer from the steam generator channel head.

In order to prevent the water/grit spray from entering the reactor coolant system, inflatable plugs were installed. To ensure that there is no leakage past these plugs, the following items are continuously monitored:

1. Inflatable seal pressure
2. Decontamination system water inventory
3. Reactor vessel level
4. Volume control tank level
5. Boron concentration (samples are taken once per hour during the decontamination operation).

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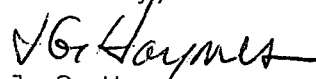
At 2145 the decontamination system operation was shut down as a result of excess makeup to the system. Boron analysis at 2155 indicated that a dilution of 51 ppm had occurred. The analysis prior to this had shown no change in boron concentration. The loop seal was examined and found to have failed. A seal pressure change was not observed because the gauge quick disconnect fitting was not properly connected, isolating the gauge and air supply from the inflatable seal. Examination of the seal found a 10 inch tear in the rubber balloon resulting in seal failure. The tear was examined and found to be a clean, straight split, indicating that no material was lost. Subsequent investigation by Westinghouse indicated that the seal failed because the rubber material used for the balloon had aged beyond the manufacturer's recommended shelf life. In addition, elongation measurements performed by Westinghouse indicate the region of failure corresponds to the region of highest elongation. Based on this information, the following corrective actions have been taken to improve seal performance:

1. New balloon material has been obtained and it has been verified that its age does not exceed the manufacturer's recommended shelf life.
2. The seal hub diameter has been increased to reduce the elongation in the region of failure.
3. The check valves within the quick disconnect fittings have been modified to preclude isolation of the pressure gauge.
4. The quick disconnect fittings will be wired closed to preclude inadvertent disconnection.
5. A test has been developed to insure that the seal is inflated and that all connections are properly made up.
6. Westinghouse has initiated additional design efforts to develop alternate loop seal designs.

The dilution in boron concentration of 51 ppm represents a reactivity addition in excess of 50¢ requiring reporting in accordance with Section 6.9.2.a of the Technical Specifications. The inadvertant dilution occurred during a time when containment integrity was not established. At no time did boron concentration decrease below 2500 ppm which represents a  $K_{eff}$  of 0.90. Decontamination of the steam generators was discontinued until repairs to the seals and corrective action to prevent recurrence was completed.

Should you require additional information on this matter, please let me know.

Sincerely,



J. G. Haynes

Manager of Nuclear Operations

Attachment: LER 80-036

cc: Director, Office of Inspection and Enforcement (40)  
Director, Office of Management Information & Program Control (3)  
Director, Nuclear Safety Analysis Center  
L. F. Miller (USNRC Resident Inspector)