MALFUNCTION OF FUEL ELEMENT TEMPERATURE SENSING CIRCUIT

This report was prepared and forwarded to the Nuclear Regulatory Commission in accordance with Paragraph 4(a) of Reactor License R-84 and Table I of the Technical Specifications.

I. Description of Malfunction.

At 1117 a.m. on 30 July 1979 a reactor operator noticed that the fuel temperature indicators were not functioning properly while preparing to perform an experiment. The reactor was not critical at the time of the malfunction. The system had been found operational during the weekly check at 1020 a.m. on the same morning. The system was repaired, recalibrated, and back in service at 1102 a.m. on 31 July 1979.

II. Cause of Malfunction.

After extensive testing it was found that the signal ground was floating with respect to the system ground.

III. Corrective Action Taken.

Since this system monitors the principal safety parameter of the reactor, it was felt that a more secure ground was required. Consequently, a grounding strap was installed at the main ground, thus, locking signal ground and system ground together at a point where no strain could be applied.

IV. Safety Evaluation.

The alternating current induced in the system by the open ground caused the scram function to operate at an indicated 200°C to 300°C, which is well below the 600°C required by the license, so that even if the reactor had been critical at the time of the failure the system would have failed in the safe direction. The corrective action taken insures that the system will not break ground due to movement of component doors and drawers.

V. Safety Review.

The AFRRI Reactor and Radiation Safety Committee has reviewed this report and recommend forwarding to the NRC.