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Director of Nuclear Reactor Regulations
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: Docket 50-186
University of Missouri
License R-103

Subject: Failure of Nuclear Instrumentation Channel 6

Description

On January 28, 1979, while operating at a steady state power of 10 MW, channel 6, one of three Nuclear Instrumentation (N.I.) Power Range Channels, changed in indication from 101.5% to 82% in one step with no change in the other channels. Each power range channel is required to provide a rod run-in at 115% of full power and a reactor scram at 125% of full power. With channel 6 indicating 82% with the reactor operating at 10 MW, the rod run-in and reactor scram trips from channel 6 would not have tripped if reactor power level had increased to 125% of full power, which is a deviation from Technical Specifications 3.3.a and 3.4.c.

Analysis

At 0530 on January 28, 1979, while operating the reactor at a steady state power of 10 MW, an operator observed the indication on N.I. channel 6 decrease from 101.5% to 82% in one step. N.I. Power Range Channels 4 and 5 were in agreement with the heat balance, but channel 6 was not; therefore, the reactor was shut down at 0544 to comply with Technical Specifications 3.3.a and 3.4.c.

A front panel check of the instrument showed that it indicated low which proved it was a circuitry problem, not a problem with the detector. The D.C. Amplifier, AR-15, was replaced with a spare board and a second front panel check was made verifying the instrument circuitry was operating properly.

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There was no failure of the safety system, since N.I. Power Range Channels 4 and 5 were operational and would have provided the required rod run-in or scram protection.

Corrective Action

As stated in the analysis, the reactor was shut down and the problem corrected. The old D.C. Amplifier module was bench tested and found to have a bad integrated circuit chip, which was replaced.

Sincerely,

J. C. McKibben
Reactor Manager

Don M. Alger
Associate Director

JCMK:vs

cc: Directorate of Regulatory
Operations, Region III

Reactor Advisory Committee
Reactor Safety Subcommittee