



UNIVERSITY OF MISSOURI

Research Reactor Facility

January 15, 1979

Research Park
Columbia, Missouri 65201
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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 December 19, 1978 while performing a reactor start up, Channel 6, one of three Nuclear Instrumentation (N.I.) Power Range Channels, failed to respond to changes in reactor power. 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 the instrument failing to respond, its associated rod run-in and reactor scram trips were inoperable, which is a deviation from Technical Specifications 3.3.a and 3.4.c.

Analysis

On December 18, during a routine maintenance day, the N.I. Channel 6 un-compensated detector chamber and both coaxial cables were replaced. As part of the start up following the maintenance, the reactor was brought to a steady power level of 5 MW at 0049, December 19, 1979, to make a comparison between the nuclear instrumentation indicated power and the indicated heat balance, as required by the Standard Operating Procedures. N.I. Power Range Channels 4 and 5 were in agreement with the heat balance but Channel 6 was not indicating. An attempt was made to relocate the detector drywell to increase Channel 6 indication, but the instrument did not respond; therefore, the reactor was shut down by initiating a manual rod run-in at 0055 to comply with Technical Specifications 3.3.a and 3.4.c.

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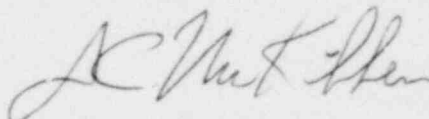
The two HN cable connectors for Channel 6 were found only partially threaded, which prevented the center pin from making good electrical contact. After both connections were securely tightened, the 50 KW power range modules were inserted and the instrument was response checked with a high level gamma source. Then the 10 MW power range modules were reinserted, and a front panel check of the instrument was made verifying the instrument circuitry was still operating properly.

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.

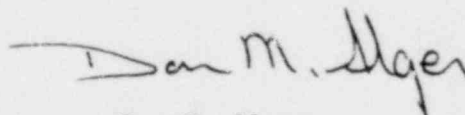
Corrective Action

As stated in the analysis, the reactor was shut down and the problem corrected. The occurrence has been reviewed by both the Electronic Technicians and the operating staff. A standing order has been issued to require performing a response check of a detector any time work is performed on the detector or its associated cables prior to reactor start up.

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