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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 Regulating Blade Position Rod Run-in

Description

On November 27, 1978, a set screw came loose on the Regulating Blade position indication so that the regulating blade position indication failed to respond to blade movement. A reactor rod run-in is initiated by the regulating blade indication being less than 10% withdrawn. With the indication not responding, this rod run-in was inoperable, which is a deviation from Technical Specification 3.4.C.

Analysis

After taking 0500 log readings with the reactor in automatic control, the shift supervisor noticed that the regulating blade position indication had not changed since the previous reading. The regulating blade drive motor was verified to be operating with no corresponding change in position indication. The reactor was shutdown at 0513 due to inability to comply with Technical Specification 3.4.C.

The set screw on the position indication chain drive gear was found to be loose. With the regulating blade driven full in, the indication was reset to zero to match the blade position. The set screw was tightened, and the regulating blade was exercised several times over its full travel length to verify the indication functions operated properly.

The regulating blade less than 10% withdrawn rod run-in is not required to avoid reaching a limiting safety system setting. It causes the regulating blade to go out of automatic control by actuating a rod run-in just before the blade has reached the full in position.

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Additionally, there is a rod run-in actuated by the regulating blade drive mechanism being full in and is independent of the position indication. A failure of both rod run-in functions would only result in a nuclear instrumentation power range high power rod run-in assuming the positive reactive addition continued and no operator action. Therefore, there is no unreviewed safety question.

Corrective Action

As stated in the analysis section, the reactor was shutdown while the regulating blade position indication was reset and repaired. The set screw will be checked tight when performing the preventive maintenance on the regulating blade drive every six months.

Sincerely,

J. C. McKibben
Reactor Manager

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Endorsement
Reviewed and approved

Robert M. Brugger
Director

cc: Directorate of Regulatory
Operations - Region III

Reactor Advisory Committee