



Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

October 4, 2000

Re: Reportable Occurrence: Violation of Tech Spec 3.2.3 and 3.2.4
License No. R-2, Docket No. 50-005

Dear Sir or Madame:

This letter is to report, in accordance with Tech Spec 6.6.2, a reportable occurrence on October 4, 2000 at The Pennsylvania State University's Breazeale Nuclear Reactor. A discussion of this event took place by telephone with Marvin Mendonca, NRC Headquarters and Tom Dragoun, NRC Region 1 at approximately 1330 hours on October 4, 2000.

A violation of Tech Spec 3.2.3 and 3.2.4 occurred when the power range channel was inoperable while the reactor was not secured. Tech Spec 3.2.3 states: "The reactor shall not be operated unless the measuring channels listed in Table 1 are operable." Tech Spec 3.2.4 states: "The reactor shall not be operated unless all of the channels and interlocks described in Table 2a and Table 2b are operable." During approximately 30 minutes of operation on October 4, 2000 the power range channel (PR) was inoperable.

On October 4, 2000 a routine startup for operation at 700 kW was in progress when a reactor stepback due to a mismatch between the two power measuring channels was received. The stepback drives the safety, shim, and regulating rods to their lower limit. Upon receipt of the stepback the reactor operator took steps to drive the transient rod in, secured the reactor and notified the duty SRO. The reactor stepback was caused by the lack of signal on the PR. When the indicated power on the wide range channel (WR) exceeded the deviation setpoint from the PR the stepback was produced. A "Do Not Operate" (DNO) tag was placed on the reactor console and appropriate management and maintenance personnel notified.

Investigation determined that on the previous day, October 3, 2000, during a movement of the reactor bridge the high voltage and signal cables for the PR had been stressed and the cables pulled out of the connectors. The reactor was secured at the time and the separation was not observable by normal observation. No operations took place after the failure on that day. A normal checkout was performed prior to operation on October 4, 2000. The checkout can not and did not detect the loss of cabling. On October 4, 2000 prior to the startup during which the stepback took place the reactor was started (~0917 hours), operated at 3 kW, and shutdown (~0939 hours). This power level is not sufficient to produce a reading on the PR channel and thus the failure was not detected. At approximately 1020 hours the startup for the 700 kW run was begun; at the time of the stepback the reactor was in AUTO on a period of ~20 seconds and at a power level of 300 kW. The rods began insertion thus slowing, stopping, and reversing the power increase. The maximum power reached was 329 kW. The stepback setpoint is 300 kW. Due to the characteristics of the gamma chamber that provides the signal for the PR, prior to the stepback it would have been almost impossible for the operator to have detected there was no signal.

Interviews of operations personnel involved with the event have been conducted and the historical trend capabilities of the console have been utilized to determine the cause of the event. The affected cables are being replaced; other wiring is being checked for similar stressing; the physical stops for movement of the bridge as well as cable allowance for such movement are being checked. Following the repairs the reactor will be restarted under controlled conditions to verify proper operation prior to returning to normal operation.

A 14-day report will be submitted by October 18, 2000.

Sincerely,

C. Frederick Sears
Director, Radiation Science
And Engineering Center

cc: M Mendonca (NRC Headquarters)
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T. Dragoun (NRC Region I)
L. Burton
J. Brenizer