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General Offices: 312 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 616 • BR 2-5500

September 24, 1971

Dr. Peter A. Morris, Director
Division of Reactor Licensing
US Atomic Energy Commission
Washington, DC 20545

Re: Docket No 50-255
License No DPR-20
Palisades Plant

Dear Dr. Morris:

This letter is written to apprise you of two recent occurrences involving the control rod drive system at this facility.

At the time of the two events, the reactor was critical at a 10^{-4} power level and primary system conditions were:

Boron Concentration	1220 ppm
Temperature	532°F
Pressure	2100 psia
Primary Coolant Pumps	
in service	3 (out of 4)
Low Power Physics Testing	
in progress	

The first incident occurred at 1403 on September 15, 1971, when the test switch to the clutch power supply of control rod drive mechanism number 4 was opened at the control rod drop test panel (a step in the test procedure) and the control rod failed to drop. The circuitry was checked and found to be in order. At this point, the rod was dropped by applying a slight force to the lower half of the clutch. The control rod drive was then drop-tested 10 times from the test panel without incident (average drop times were 1.2 to 1.3 seconds).

Low power physics testing was then resumed and involved dropping each control rod individually into the core. Boron concentration in the primary coolant was maintained at a level whereby any one of the forty-five control rods withdrawn would be capable of bringing the core subcritical.

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Dr. Peter A. Morris
US Atomic Energy Commission
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The second incident occurred at 1908 on September 15, 1971. The rod drop test switch for control rod drive mechanism number 31 was opened and this control rod failed to drop immediately (13 seconds consumed before reaching the 90% core insertion point).

Again, as in the case of control rod drive mechanism number 4, repeated drop tests of the control rod number 31 resulted in normal drop times.

All single-control-rod-drop tests were completed and the reactor secured with all control rods fully inserted to allow the removal of drive package numbers 4 and 31 for examination to determine the cause for the observed malfunctions.

CAUSE OF INCIDENTS

Examination of the clutch surfaces in the drive package of control rod drive mechanism numbers 4 and 31 disclosed a slight deposit of a material appearing to be epoxy as well as some foreign material. The clutch face in drive package number 4 contained the largest concentration of the material (approximately 1/16 x 1/8 inch). These deposits were located so as to hamper the free movement of the spring loaded moveable clutch face.

The conclusion reached was that the epoxy application during the installation of new spring and pins on the magnetic clutch in March 1971 was excessive. Evidence indicates some of the substance flowed into the spring holes in the lower clutch face and in some cases to the spline area below the springs.

CORRECTIVE ACTION PLANNED

Additional drive packages were removed and the clutch faces reworked the week of September 20, 1971, during which time the primary coolant system was at ambient temperature and atmospheric pressure to allow primary coolant pump seal(s) replacement.

The remainder of the drive packages are to be reworked before initiating any further testing and/or operator training in utilizing the reactor. All springs will be replaced to preclude a change in spring constants by prior deposits of epoxy. Any application of epoxy to lock the spring pins in place will be controlled so as to prevent any of the substance from entering the spring holes.

Yours very truly,

LMH/ERC/mhc

R. L. Haueter
Electric Production
Superintendent - Nuclear

CC: BHGrier
USAEC Compliance, COO