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Commonwealth Edison Company

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Dresden Nuclear Power Station

R. R. #1

Morris, Illinois 60450

October 27, 1972

WPW-D1,2,3

Ltr. #246-72



Mr. A. Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D.C. 20545

Subject: License DPR-19, Dresden Nuclear Power Station, Unit #2,
Section 6.6.C.1 of the Technical Specifications

Dear Mr. Giambusso:

This is to report a condition relating to the operation of the unit, in which, on September 29, 1972, it was determined during routine surveillance testing, that the #1 turbine control valve fast-acting solenoid would not actuate. This would have prevented de-energization of load reject scram relay 590-121A of the reactor protection system, had it been required, contrary to the requirements of Table 3.1.1 of the Technical Specifications.

PROBLEM AND INVESTIGATION

The Unit #2 reactor was critical and electrical load was 430 MWe at approximately 2130 on September 29, 1972. Preparations were being made to conduct the weekly turbine valve surveillance test.

At 2140, the #1 Main Stop Valve/Control Valve test button was depressed to exercise the #1 control valve. It was observed that the control valve went fully closed at the normal smooth speed, rather than fast closing the last 10% of travel. Also, the associated half scram which should result from actuation of the fast acting solenoid did not occur.

The valve should close from 100% to 10% open at the normal speed and then close from 10% open to fully closed at the fast speed. When the valve reaches the 10% open position it actuates a limit switch which energizes a fast acting solenoid valve. The solenoid valve shifts to initiate control valve fast closure. The fast acting solenoid valve also actuates a micro switch which operates relay 590-121A in the reactor protection system.

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Fuse 590-725D was then pulled to intentionally de-energize relay 590-121A and meet the requirements of Table 3.1.1 of the Technical Specifications.

Investigation showed that the cause of this malfunction was a "stuck" fast acting solenoid valve. When the solenoid was energized, the fast acting valve could not reposition itself. Apparently, "crud" had accumulated around the valve preventing its normal smooth operation.

The generator load reject (which actuates the fast acting solenoid and results in control valve fast closure) scram is an anticipatory scram. Its purpose is to prevent a reactor scram caused by high neutron flux. Without generator load reject scram capability, the rapid pressurization caused by the control valve fast closure (about 100 psi/sec) would reduce the void content of the core and produce a sharp neutron flux spike. This spike would reach about 11.4 times the initial power level before the high neutron flux scram shuts down the reactor. With the anticipatory scram, the neutron flux peaks at about 3.75 times the full power.

Proper operation of the other three control valves was verified at the time of the surveillance test. Therefore, if a turbine generator load reject signal was received, the other three valves would still fast close and the reactor would scram. Also the pressure spike would be greatly reduced, since the #1 control valve would stay open, allowing pressure to be released to the turbine.

No other malfunctions of this type have been identified previously, or since this incident.

CORRECTIVE ACTION

The solenoid valve was manually cycled a number of times to flush hydraulic fluid through the valve.

The #1 control valve testing circuit was then operated a number of times. Fuse 590-725D was reinstalled and proper operation of the circuit was verified at 0145 on September 30, 1972.

Sincerely,

H. J. Niederich _{for}

W. P. Worden
Superintendent

WPW:GJD:sdb