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30-254



BBS-73-22

February 16, 1973

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

Reference: Quad-Cities Nuclear Power Station Unit 1
Docket No. 50-254, License DPR-29
Appendix A, Section 1.0.A.2, 3.1, and 6.6.B.

Dear Mr. Giambusso:

The purpose of this letter is to inform you of the details concerning the failure of a limit switch on a Unit 1 Main Steam Isolation Valve. The function of the limit switch is to provide a valve closure input signal to the Reactor Protection System. This abnormal occurrence was reported to you by telegram on February 3, 1973.

DESCRIPTION OF INCIDENT

On February 3, 1973 with the Unit 1 reactor operating at 35% power, a functional test was conducted on the Main Steam Isolation Valve (MSIV) instrument channels. This monthly surveillance test is conducted by removing a fuse in one instrument channel and then closing an MSIV in a second steam line to the 90% open position to verify that an RPS channel trip is obtained. When MSIV 1C was exercised, an RPS trip was not received. All other valves properly de-energized their respective RPS relays.

INVESTIGATION

Each MSIV has limit switches which de-energize two RPS trip auxiliary relays. The relays are then combined in logic such that isolation of two steam lines is allowed before a full reactor scram would be initiated due to valve closure.

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The limit switches are normally closed and open when the valve is <90% open. Investigation revealed that one of the two RPS relays monitoring the C steam line was not dropping out when the 1C valve was exercised. The fuse was removed for this relay, 590-102D, to place the channel in a tripped condition.

Prior to a drywell entry to inspect the valve on February 3, it was exercised again and this time the limit switch operated satisfactorily. The valve was then operated repeatedly with the fuse re-installed and the 590-102D relay dropped out properly on each occasion. The surveillance test was also repeated and the RPS trip occurred as expected.

The switch continued to operate properly during the twice weekly valve exercise surveillance until the unit was shut-down the same week to repair a condenser tube leak. On February 8, 1973 during the outage the 1C MSIV limit switches were removed by station maintenance personnel and disassembled. The switches operated freely by hand and appeared to be in good condition. What appeared to be dried lubricant was found under some of the contact arms, however, it is not believed that this could have caused the failure. The switches were all cleaned, reassembled and installed. The valve was then tested satisfactorily several times.

CONCLUSIONS

The safety significance of this failure is that a closure of the 1C valve combined with isolation of the A steam line and B or D lines would not have produced a scram. Isolating either combination of these three lines, however, would have resulted in a high flux scram or a high flow isolation. Any isolation would have produced a scram from the remaining operable valve limit switches. The only feasible event which could cause an isolation of only three lines would be an air system failure or a coincident failure of both MSIV's in one line when an isolation occurred. The air system failure would result in a very slow closure of the valves and would affect all four steam lines. The probability of three lines isolating before the valve in the fourth reaches 90% open is considered to be extremely remote. The coincident failure of two valves in the same line is also extremely unlikely since all valves are exercised twice a week.

Mr. A. Giambusso


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February 16, 1973

While previous problems have been experienced with MSIV limit switches this was the first instance in which a switch failed to open. No further investigations are planned at this time since the problem could not be duplicated. Surveillance testing conducted monthly will readily detect any failures in the future.

Very truly yours,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION


B. B. Stephenson
Station Superintendent

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