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August 30, 1984

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
LER/RO-369/83-97
LER/RO-369/83-82
LER/RO-369/83-65
LER/RO-369/83-35

Dear Mr. O'Reilly:

The following is additional information relating to Reportable Occurrence Reports RO-369/83-35, 83-65, 83-82, and 83-97 which were submitted by my letters dated June 28, August 31, October 11, and November 4, 1983, respectively. During 1983, failures of pressurizer heater group 1B resulted in four Reportable Occurrence Reports (as noted above). Efforts have been made to locate the sources of the problems to prevent further occurrences. Duke Power Company has completed an investigation into the cause of the failures and has located the source of the problem. Details of the actions taken to locate and repair the intermittent problem in pressurizer heater group 1B are given below.

Located within each vacuum contactor control panel is a vacuum contactor (Electric Machinery Industrial Controls Corporation, Type VBS3AD630D1). The vacuum contactor is comprised of a main frame, a steel L-shaped armature, three vacuum switches (one per phase), opening springs, closing springs, and auxiliary contacts. The springs, acting against the armature, hold the vacuum switches in the normally open position. When the coil energizes, the L-shaped armature plate is attracted horizontally to the magnetic pole of the coil, compressing the springs. The armature pivots transmitting movement by a bell-crank action, allowing the vacuum switches to close under the effect of atmospheric pressure acting on the bellows. The failures of pressurizer heater group 1B to energize were suspected to be caused by a component in the contactor control circuit. The contactor control circuit was checked several times and no problems were found.

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On May 2, 1984 technicians troubleshooting pressurizer heater group 1B to determine the cause of the failures noticed the voltage and current measurements in each phase were inconsistent and at times were not correct. These symptoms indicated that the vacuum contacts were not making proper contact in two of the three phases ("Y" phase measured consistently good). On May 7, 1984 the "Y" phase tension insulator stud was found to be too tight, causing poor contact in the "X" and "Z" phase power. The tension insulator studs on all three phases were adjusted per the "Instruction Manual for Slimline Vacuum Contactor ," and pressurizer heater group 1B was placed back in service and operated for several hours. It was rechecked and the problem still existed.

It was decided to move the vacuum contactor (the assembly) from pressurizer heater group 1B to group 1D. On May 8, 1984, the vacuum contactor from pressurizer heater group 1D was moved to group 1B (if the problem cleared in 1B and appeared in 1D, it would verify the vacuum contactor to be faulty). After several hours the vacuum contactor in group 1D failed to energize. Pressurizer heater group 1B functioned properly and has not failed since the contactor change-out on May 8, 1984. A new vacuum contactor has been ordered to replace the one in pressurizer heater group 1D.

The problem with the vacuum contactor appears to be directly related to temperature. The contactor functions properly with the cabinet door open but fails after several hours with the cabinet door closed (neither exterior or interior cabinet temperatures were above rated temperature for the contactor). A fan was installed outside the pressurizer heater group 1D cabinet to blow ambient air into the cabinet, but this additional cooling has been unsuccessful. This is only temporary and will be removed when the new vacuum contactor is installed.

Pressurizer heater groups 1A and 1B receive essential power with 1C and 1D receiving non-essential power. Technical Specification 3.4.3 requires that two groups of pressurizer heaters be operable. Since group 1B receives essential power, its operability and reliability was improved by the swap from group 1D. Relocating the vacuum contactor from pressurizer group 1B to 1D verified that the problem was the contactor. Pressurizer heater group 1B has not failed since the change on May 8, 1984.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

FBN:scs

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