DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

December 30, 1981

TELEPHONE: AREA 704
373-4083

Mr. J. P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Re: McGuire Nuclear Station Unit 1
Docket No. 50-369

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Report RO-369/81-188. This report concerns T.S.6.9.1.12(e), "Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of system(s) used to cope with accidents analyzed in the SAR". This incident was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

William O. Parker, Jr.

PBN/jfw
Attachment

cc: Director
Office of Management and Program Analysis
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. P. R. Bemis
Senior Resident Inspector-NRC
McGuire Nuclear Station

Records Center
Institute of Nuclear Power Operations
1820 Water Place
Atlanta, Georgia 30339

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REPORTABLE OCCURRENCE REPORT NO. 81-188

REPORT DATE: December 30, 1981

FACILITY: McGuire Unit 1, Cornelius, NC

IDENTIFICATION: Manual Initiate Pushbutton Engineered Safety Features (ESF) Switches Failed during Periodic Test

INTRODUCTION: On December 12, 1981 "A" train ESF manual initiate switches failed to actuate all of their designed devices during the Engineered Safety Features Actuation Periodic Test. Initial indications were that when the switches were depressed, some of the contacts changed state while others did not. Following this failure, the switches were tested at least 30 times with no more failures. Controlled devices and cables on "A" train were checked and no problems were found. The switches had not been cycled since the ESF functional test was performed almost two years ago.

A recorder was connected to the outputs from the "B" train manual switches in order to check the first cycle responses after the same two years of inactivity. Failures similar to those found on "A" train were also found on "B" train during the early cycles. This test (performed December 16) eliminated the possibility of other components in the manual initiate ESF circuitry from causing the problem and centered attention on the switches. After the early cycle failures the switches worked consistently. During one of the ESF periodic tests some problems were experienced with one of the reset switches, and appeared to be similar to the initiate switch problems.

There were four initiate switches and three reset switches per ESF train that were involved in the problem. The switch assemblies consisted of E-30 operators and combinations of E30KAL4 and/or E30KAL3 switch blocks made by Cutler Hammer. The E30KAL3 switch blocks consisted of one normally open set of contacts and one normally closed set of contacts. E30KAL4 switch blocks consisted of two normally open sets of contacts.

There appears to be no correlation between the failures and the switch service. The train "A" safety injection initiate switch failed but the train "B" safety injection initiate switch did not. Voltage and current values for the switches are mostly 48VDC and 38mA or less in this service.

Immediate corrective action was to declare the switches inoperable on December 16. This incident is the result of a Component Malfunction/Failure. Unit 1 was in Mode 5, Cold Shutdown, throughout the incident.

EVALUATION: The contacts on these switches are enclosed but not sealed. They are not normally used; and, when the failures occurred, had not been cycled in almost two years. Periodic testing, using the defective switches, on December 14 and 18 was conservative in that any switch failures would have shown up in the test results.

The ESF switches which fit the low voltage, low current criteria include the four manual initiate switches on both trains (SM isolation, safety injection, Phase A isolation and Phase B isolation/containment spray) and three of the reset switches on each train (containment spray, Phase A isolation, and Phase B isolation).

CORRECTIVE ACTION: All of the ESF manual initiate and reset switches which have contacts used in low voltage, low current applications are being replaced with new switches of the same type. The new switches will be tested before and after installation to insure their operability. The defective switches will be sent to Culter Hammer for examination and analysis. Further action will depend on the results of the Cutler Hammer testing.

McGuire operators will be informed of the problem and cautioned that multiple cycles of these switches may be required to actuate all of the controlled devices. Operators will also be advised that in all cases of switch failure, cycling the switch cleared up the problems. Preliminary information from Cutler Hammer indicates that a chemical coating may be building up on the contacts, and that the low voltages involved may not be sufficient to ensure current will be established during the early cycles. New switches should correct this problem until a permanent solution is determined.

SAFETY ANALYSIS: Switch failures occurred only during the early cycles after a long period of inactivity. If the switches had been needed, the operators could have actuated all of the required devices by repeatedly cycling the defective switches.

No incidents have occurred since fuel loading which required manual actuation of the ESF loads. Health and safety of the public were, therefore, not affected by this incident.