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March 16, 1983

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street NW, Suite 2900
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Report RO-369/83-09. This report concerns T.S. 4.8.1.1.3, "All diesel generator failures, valid or non-valid, shall be reported to the Commission...". This incident was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

PBN:jfw
Attachment

cc: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Mr. W. T. Orders
Senior Resident Inspector
McGuire Nuclear Station

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REPORTABLE OCCURRENCE REPORT NO. 83-09

REPORT DATE: March 16, 1983

FACILITY: McGuire Unit 1, Cornelius, NC

IDENTIFICATION: Invalid Failures on Diesel Generator 1B Occurred Due to Overcurrent Relay and Voltage Regulator Problems

DESCRIPTION: Diesel Generator (D/G) 1B experienced six invalid failures on 11/12-13/82 and one invalid failure on 11/17/82. Unit 1 was in Mode 5 during each of these occurrences.

The problem encountered during the first three invalid failures resulted from the D/G breaker opening immediately after being closed. It was discovered that two wires on the D/G overcurrent relay circuitry had been placed on the wrong terminal during a recently completed modification. These wires were then placed on the correct terminal, and the D/G breaker worked properly. These invalid failures were attributed to Personnel Error.

The next three invalid failures resulted from a loss of manual D/G voltage control from the local panel and the Control Room. The problem was caused by burned diodes in the motor operated control potentiometer on the voltage regulator. The potentiometer was replaced, and the D/G manual voltage response was verified. These invalid failures were attributed to Component Failure/Malfunction.

On the last invalid failure, the D/G tripped due to low crankcase vacuum. The low crankcase vacuum condition was theorized to be caused by a temporary clog in the crankcase vacuum oil separator screen; however, a definite cause was not discovered. The D/G was restarted and loaded with no further problems. This invalid failure was classified as an Unknown cause, and is similar to previous RO-369/81-119.

EVALUATION: During an outage in November 1982, a modification was performed to allow the target on the D/G overcurrent relay to be reset without closing the D/G breaker to the 4160V switchgear. Two wires in the overcurrent circuitry were incorrectly placed on terminal J-11 instead of J-10 when the modification work was performed. The other side of terminal link J-11 was tied to a positive source for an annunciator alarm. This positive signal provided the means to actuate the overcurrent relay so that the D/G breaker would not remain closed. The error was discovered during three checkout runs prior to the QA inspection. These three failures were classified as invalid because the D/G was being operated in a troubleshooting capacity subsequent to the modification.

Shortly after repairing the overcurrent relay problem, the D/G was started and loaded to 4 MW. While trying to make a power factor change (by adjusting the voltage), it was discovered that the manual voltage control was no longer working. The D/G was shutdown so the problem could be investigated. It was determined that two diodes in the motor operated control potentiometer (Basler Electric Co., Model No. MOC2503, Part No. 90 72300 111) had burned. During the investigation

the automatic capability of the voltage regulator was proven to be still operable. The failure of these diodes was apparently random since no specific cause could be determined. These three D/G failures are classified as invalid since it was being operated to check for problems under full load conditions following the modification work.

The low crankcase vacuum trip was theorized to have been caused by the oil separator screen in the suction of the crankcase vacuum blower becoming temporarily clogged with oil. This has been known to happen at loads slightly higher than 4 MW. The increased concentration of oil in the crankcase air (from turbulence) could have clogged the screen and reduced the vacuum enough to trip the D/G. This theory, however, could not be verified. This failure was invalid because the low crankcase vacuum trip is bypassed during emergency operation and the D/G was not operated for more than one hour at >2000 KW.

SAFETY ANALYSIS: The first six of the D/G failures were the result of troubleshooting and checkout activities following D/G modification work. Wiring modifications to safety related equipment are thoroughly inspected and functionally tested before the QA inspection occurs. It was during this checkout that the wiring problem was found. The ability of the voltage regulator to automatically maintain the voltage at 4160V (emergency operation mode) was verified during the investigation of the voltage control problem. The burned diodes only affected the manual portion of the voltage regulator circuitry. The low crankcase vacuum trip did not render the D/G inoperable, since it was started and fully loaded immediately afterward.

D/G 1A was available for emergency operation during the times that these events occurred. The health and safety of the public were not affected by these occurrences.

CORRECTIVE ACTION: The overcurrent relay circuitry problem was corrected by removing the wires from J-11 and placing them on J-10 as required by the modification drawings. After the overcurrent relay circuitry was corrected, the D/G was started. The D/G breaker closed properly and the D/G was loaded to 4 MW.

The voltage control problem was corrected by replacing the motor operated control potentiometer in the voltage regulator. The D/G was then started, and the manual voltage control was verified from the local panel and the Control Room panel.

No corrective action was required for the spurious low crankcase vacuum trip. Following the low crankcase vacuum trip, the D/G was restarted and operated at full load for approximately 1.5 hours with no indication of any low vacuum conditions.