

DUKE POWER COMPANY

P.O. BOX 33189  
CHARLOTTE, N.C. 28242

HAL B. TUCKER  
VICE PRESIDENT  
NUCLEAR PRODUCTION

TELEPHONE  
(704) 373-4531

85 SEP 17 11:15  
September 13, 1985

Dr. J. Nelson Grace, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30323

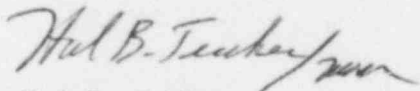
Subject: McGuire Nuclear Station - Unit 2  
Docket No. 50-370  
Diesel Generator Failure

Gentlemen:

In accordance with McGuire Nuclear Station's Technical Specifications 4.8.1.1.3 and 6.9.1, attached is a report of Valid and Invalid Diesel Generator (D/G) failures which occurred at McGuire between August 16 - 18, 1985, during testing and troubleshooting of the Diesel Generator.

The event had no impact on the health and safety of the public.

Very truly yours,



Hal B. Tucker

JBD/hrp

Attachment

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

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

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

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PDR ADOCK 05000370  
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DUKE POWER COMPANY  
McGUIRE NUCLEAR STATION  
Diesel Generator 2A Valid and Invalid Failures

On August 16, 1985, the Diesel Generator (D/G) 2A operability test was terminated early due to fuel oil spraying from the fuel injection pipe assembly on cylinder 4 left (4L). The run test was considered a valid failure since the diesel was shut down after one hour due to an abnormal operating condition. Attempts to repair and test the leaking fuel oil line resulted in four invalid failures, two on August 16 and two on August 18, 1985.

In a separate, unrelated incident, Diesel Generator 2A experienced an invalid failure on August 20, at 1085, during a troubleshooting start attempt to investigate a "barring gear engaged" alarm. The invalid "barring gear engaged" alarm was the result of a failed limit switch. The limit switch failed due to the accumulation of water in the switch as the result of overhead roof leaks during heavy rain storms.

At the time of the August 16 incidents, Unit 2 was in Mode 1 at 91% power. At the time of the August 18 incidents, Unit 2 was in Mode 1 at 88% power. On August 20, Unit 2 was in Mode 1 at 100% power.

The valid failure on August 16, 1985 is attributed to "component failure" because of the failed pipe assembly. A contributing administrative deficiency is assigned to the event due to the breakdown in communications between Mechanical Maintenance, and Planning personnel that led to an inadequate follow through of an earlier repair problem. An Unusual Service Condition is assigned to the invalid failure resulting from the barring gear limit switch failure.

On August 7, 1985, D/G 2A was started at 1829 and loaded to 4000 KW to perform the D/G 2A Operability Test. As the operability test was being completed, a small fuel oil leak was observed on cylinder 4L. A priority work request (WR) was written to repair the leak.

During the repair attempts, it was determined that the piping at the injector head would have to be replaced. Due to the unavailability of a replacement part, the old fitting was reinstalled and tightened. The leak was reduced but was not stopped completely. It was felt that this small leak would not prevent D/G operation.

It was requested that a work request be written immediately to replace the pipe assembly. A Mechanical Maintenance supervisor wrote a WR and submitted it to Planning. The Mechanical Maintenance supervisor was contacted by a Planning shift scheduler two days later and informed that the work request should be voided since the work could be scheduled on an upcoming D/G 2A work request to repair an exhaust leak. Therefore, the WR was voided. Operations personnel did not want the pipe assembly replacement scheduled with the exhaust leak repair WR and that another WR needed to be written for the leak repair. The Mechanical Maintenance supervisor was not informed. As a result of the breakdown in communications, another WR for the leak repair was never written and the part was not ordered.

Ten days had elapsed since the leak was first identified on the fuel injection pipe assembly. On August 16, at 1303, the pipe assembly failed during a

routine operability test, spraying fuel oil from the fitting. Attempts to re-tighten the fitting failed and resulted in two invalid failures as a result of troubleshooting start attempts. The replacement part was emergency requisitioned. When the replacement part was received, the repairs to D/G 2A were quickly completed. However, D/G start attempts to troubleshoot the repairs resulted in two additional invalid failures on August 18.

The fuel injection pipe assemblies were out of stock in the station warehouse. The assemblies had been ordered but were not scheduled to arrive until October. The lead time for replenishment of stock is normally three to four months. Immediately after this incident, a materials requisition was signed to expedite an order to replenish the stock. A review of the minimum level of stocking of this part indicated that the minimum level should be doubled. A materials requisition was signed by the Operations superintendent to increase the minimum stocking level of this part.

In a unrelated event, a D/G 2A "TROUBLE" alarm was received in the control room on August 20, 1985 at 2300. The "barring gear engaged" alarm was found displayed on the D/G 2A local control panel. The signal for the "barring gear engaged" alarm originates from the barring gear limit switch. The limit switch is actually composed of two switches. The failure of one switch will defeat a manual D/G start attempt. The failure of both switches will defeat an automatic start attempt. When Operations personnel attempted to manually start D/G 2A, the attempt was unsuccessful.

A WR was written to investigate and repair the barring gear indication. Water was found in the barring gear limit switch. When the other limit switch was inspected, it also was full of moisture. One of the switches was repaired and re-installed. The other switch could not be repaired due to severe corrosion of the contacts and needed to be replaced.

The source of the moisture in the limit switches was determined to be due to rain resulting from overhead roof leaks. The roof leaks appear to be an isolated case related to several days of heavy rain storms. The roof had not leaked prior to or since this event but a WR has been written to investigate and repair any sources of leaks.

As a result of this problem, a Station Problem Report (SPR) was written to have all barring gear limit switches changed out on the remaining D/Gs.

#### CORRECTIVE ACTION:

- Immediate:
1. D/G 2A was declared inoperable after the failure of the fuel injection pipe assembly and the barring gear limit switch.
  2. Work requests were submitted to repair the failed components respectively and restore D/G 2A to operable status.

- Subsequent:
1. A work request was written to investigate and repair roof leaks over D/G 2A.
  2. A new barring gear limit switch was installed.
  3. A Station Problem Report was written to have all barring gear limit switches changed on all D/Gs.

4. A materials requisition was signed by the Operations superintendent to increase the minimum number of fuel injection pipe assemblies stored in the warehouse.
5. A materials requisition to replenish depleted stock of fuel injection pipe assemblies was expedited.
6. The work request to replace the leaking fuel injection pipe was completed and D/G 2A was returned to service.

Planned: This report will be reviewed with appropriate Planning and Maintenance personnel to emphasize the need for good communications between the sections.

VERIFICATION:

Both the leaking fuel injection pipe assembly and the failed barring gear limit switch were replaced. D/G 2A was tested and returned to service.

SAFETY ANALYSIS:

D/G 2B was available for emergency operation throughout the time period when D/G 2A was inoperable. Offsite power was also available during this time.

The health and safety of the public were not affected by this occurrence.