

Duke Power Company  
Catawba Nuclear Generation Department  
4800 Concord Road  
York, SC 29745

M. S. TUCKMAN  
Vice President  
(803)831-3205 Office  
(803)831-3426 Fax



**DUKE POWER**

February 16, 1993

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Subject: Catawba Nuclear Station, Unit 1  
Docket No. 50-413  
Special Report  
Invalid Failure of Diesel Generator 1B

Pursuant to Technical Specification 4.8.1.1.3 and 6.9.2, find attached a Special Report concerning the Unit 1 Diesel Generator B (DG 1B) invalid failure that occurred on November 24, 1992. This Special Report is being submitted late because of an administrative oversight.

Very truly yours,

A handwritten signature in cursive script that reads "M. S. Tuckman".

M. S. Tuckman

CRL/DG1B293.DOC

Attachment

xc: S. D. Ebnetter  
Regional Administrator, Region II

W. T. Orders  
Senior Resident Inspector

R. E. Martin, ONRR

9302220475 930216  
PDR ADOCK 05000413  
S PDR

Printed on recycled paper

JE22

## SPECIAL REPORT

### CATAWBA NUCLEAR STATION DIESEL GENERATOR 1B INVALID FAILURE DUE TO LOW LUBE OIL PRESSURE

An invalid failure of Diesel Generator (DG) 1B occurred on November 24, 1992 at 0834 hours due to a low lube oil pressure trip. The false low lube oil pressure signal was caused by having too small of a design pressure range for low lube oil pressure transmitter. Unit 1 was at 100% power at the time this failure occurred. Operations (OPS) was in the process of running DG 1B for its monthly Periodic Test (PT) when the failure occurred. There have been 0 valid failures in the last 20 valid tests and 6 valid failures in the last 100 valid tests. DG 1B remains on a monthly operability test schedule in accordance with Technical Specification 4.8.1.1.2 Table 4.8-1. There is no unavailability time associated with this failure.

DG 1B was manually started on November 24, 1992 for the OPS PT (start #1013). The engine ran for approximately 1 minute when it tripped on low lube oil pressure. Oil pressure as read on 1LDPG517C was well above the 35 psi low lube oil pressure trip setpoint. OPS restarted the engine and no other problems were noted. The PT was then completed. OPS initiated a work request for Instrumentation and Electrical (IAE) personnel to investigate and repair the cause of the trip. However, it was decided to conduct the work at a later date because there was not an operability concern. This was a non-emergency trip that would not effect the engine's ability to run when called upon by an emergency start (LOCA or Blackout) signal from the sequencer. The work request was scheduled for December 15, 1992 during the diesel day for DG 1B.

The December 15, 1992 diesel day was canceled due to problems with the Control Room Area ventilation system and rescheduled for January 12, 1993. On December 23, 1992, DG 1B is given an emergency start signal by IAE personnel in order for OPS to perform their monthly PT. Once again, approximately one minute into the run, the low lube oil pressure trip annunciator was received. The engine did not trip because the engine was given an emergency start signal. Several seconds later the annunciator cleared. As before, all pressures appeared to be normal. The engine run was complete without further problems.

Systems and Component Engineering personnel have noticed in the past that lube oil pressure sometimes increases to approximately 90 psi on engine starts. The range of the transmitter that monitors lube oil pressure is only 0-60 psi. This transmitter sends a corresponding 4-20 mA signal to an Analog Optical Isolator (AOI), which in turn feeds the Alarm Monitor that performs the tripping function. The component engineer recalled a similar problem on another system that involved the same model of AOI (E-Max # 175D127-8). When the input to the AOI is over-ranged to a certain point, the output fails

fails low. This over-ranged point is unique to each AOI, but is typically around 26 mA. If the AOI was over-ranged and its output had failed low at the time the group II lockout was removed, the engine would trip. When DG 1B was taken out of service on January 12, 1993, the input pressure at which AOI failed low was checked. The output was found to fail low at 81 psi input pressure to the transmitter (equivalent to an input of 25.78 mA). This supported the previous argument and was determined to be the cause of the problem. IAE personnel were instructed to replace this AOI with one from stock that had a higher dropout point. One was installed that did not fail until 27.75 mA. The engine was run on January 13, 1993 for a functional verification and no further problems were noticed.

This invalid failure was classified as a design problem due to the improper ranging of the lube oil transmitter. The 0-60 psi input range is not sufficient enough to accommodate the pressure increases seen on engine starts. The 3 low low lube oil transmitters on all 4 engines were added per Nuclear Station Modifications CN-11104 (Unit 1) and CN-20486 (Unit 2) to replace the pneumatic emergency trip sensor. During the last outage on Unit 1 (IEOC6), the pneumatic non-emergency trips were replaced per CN-11149. As part of this modification, one of the low low lube oil pressure transmitters was used via an AOI to obtain a signal to the new alarm monitor for the low lube oil pressure trip. This modification will be performed on Unit 2 this outage per NSM CN-20528.

A work request has been initiated for DG 1A to verify that the dropout point for its AOI will not cause any problems. As part of NSM CN-20528 to be performed during the current outage on unit 2 DGs, the range for the lube oil transmitters will be increased from 0-60 psi to 0-100 psi. This will ensure no overranging can occur. Unit 1 pressure transmitters will be re-ranged per exempt change CE-4000.