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DUKE POWER

November 17, 1994

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 1A

Pursuant to Technical Specification 4.8.1.1.3 and 6.9.2, find attached a Special Report concerning the Unit 1 Diesel Generator (DG 1A) invalid failure which occurred on October 21, 1994.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'DL Rehn'.

DL Rehn

KEN\DG1A1021.94

Attachment

cc: SD Ebnetter, Regional Administrator

RJ Freudenberger, SRI

RE Martin, ONRR

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SPECIAL REPORT

CATAWBA NUCLEAR STATION
DOCKET NO. 50-413
DIESEL GENERATOR 1A INVALID FAILURE
DUE TO MAIN BEARING HIGH TEMPERATURE TRIP
PIP 1-C94-1495

An **invalid failure** of Diesel Generator (DG 1A) occurred on 10/21/94 at 0914 hours due to a main bearing high temperature trip signal. Two subsequent runs for troubleshooting purposes were also classified as invalid failures. It was determined that a failed Resistance Temperature Detector (RTD) was the cause of the trip signal. Unit 1 was in Mode 1 (power operations) at 99% power when this failure occurred. There has been 1 valid failure in the last 20 valid tests and 2 valid failures in the last 100 valid tests on DG 1A. DG 1A was on a weekly test frequency due to the starting air valve corrective action required per PIP 1-C94-1301. There were 5 hours of unavailability time associated with this failure.

On 10/21/94, DG 1A was being prepared for an air roll in order to satisfy the corrective action required from the starting air valve failure. The temperature of main bearing #5 indicated ~160° F on the Rosemount Alarm Monitor panel with the engine in standby condition. This was ~15° F higher than the other bearing temperatures. Following the roll on air, the engine was started at 0907 hours (Start #1034). At 0914 hours, DG 1A tripped on high bearing temperature. The alarm monitor panel indicated channel #8 (Main Bearing #5/1LDRD5630) was the source of the trip signal. This channel indicated ~240° F following the trip, whereas the other bearing temperatures still indicated ~145° F. The bearing temperature channels are set to trip the engine at a temperature of 228° F.

Work Order (W/O) 94080816-01 was initiated to troubleshoot the problem. The alarm monitor panel was checked for any abnormalities and found to be in good working condition. When a lead wire for the RTD for this channel (1LDRD5630) was lifted and reterminated, temperature indication immediately dropped to the pre-start reading of 160° F. The engine was restarted (start #1035) and temperature for main bearing #5 immediately increased past the trip point and the engine automatically tripped.

In order to isolate the RTD as the source of the problem, the lead wires were disconnected from the alarm monitor and then reconnected to test equipment that indicated RTD temperature. A false signal was placed on channel 8 of the alarm monitor with a Decade resistance box. The engine was once more started (start #1036) and the test equipment indication immediately increased. The engine was manually shutdown at this point. Operations tagged the engine in the "Maintenance Mode" and Mechanical Maintenance removed the crankcase door to allow IAE access to the RTD. The RTD was removed from the bearing and replaced with a new one from stock. The indication on channel #8 now agreed with the other bearing temperatures. DG 1A was ran for functional verification (start #1037) without any problems. The operability performance test (start #1038) was successfully completed and the engine was declared operable on 10/22/94 at 0540 hours.

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The trip for high temperature on the main bearings is not an emergency trip function and would have been bypassed had an emergency start signal been received. The failure of this RTD would not have affected the engine's ability to start and accept loads had it been needed for a design basis event. Therefore, this event is classified as an invalid failure.

The failed RTD is a JMS Southeast Model # 3ESBK8"X10YP360. These RTDs were installed per NSMs CN-11149 (U1) and CN-20528 (U2) during 1EOC6 and 2EOC5 outages, respectively. These mods replaced the pneumatic control system with an electrical system on each diesel. There are 10 of these RTDs installed in each DG. This is the first failure since their installation. The failed RTD was sent to JMS Southeast for their evaluation. Their analysis showed that lube oil had entered the RTD sensor which resulted in a high resistance and erratic behavior. It is not yet known whether this is an isolated case or a generic problem. A survey of the other DG bearing temperatures has been performed. DG 2B had 2 channels that were indicating temperatures that did not appear to be correct. W/Os 94068192-01 and 94081546-01 have been initiated and scheduled to replace these RTDs prior to the next DG 2B run. The RTDs will be sent to JMS Southeast for their further analysis of this problem. All other indications were satisfactory.