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DUKE POWER

May 31, 1994

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

Subject: Catawba Nuclear Station, Unit 2
Docket No. 50-414
Special Report
Invalid Failure of Diesel Generator 2A

Pursuant to Technical Specification 4.8.1.1.3 and 6.9.2, find attached a Special Report concerning the Unit 2 Diesel Generator (DG 2A) invalid failure which occurred on May 01, 1994.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'DL Rehn'.

DL Rehn

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Attachment

xc: SD Ebnetter, Regional Administrator

RJ Freudenberger, SRI

RE Martin, ONRR

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SPECIAL REPORT

CATAWBA NUCLEAR STATION
DOCKET NO. 50-414
DIESEL GENERATOR 2A INVALID FAILURE
DUE TO IMPROPER TRIPPING OF LEFT TURBOCHARGER VIBRATION SWITCH
PIP 2-C94-0495

An invalid failure of Diesel Generator 2A (DG 2A) occurred on 05/01/94 due to a right bank turbocharger vibration trip. This was caused by the setting of the vibration switch for the turbocharger being too sensitive. Unit 2 was in Mode 4 (hot shutdown) at 0% power at the time this failure occurred. There have been 0 valid failures in the last 20 valid tests and 3 valid failure in the last 100 valid tests of DG 2A. DG 2A remains on a monthly operability test schedule in accordance with Technical Specification (TS) 4.8.1.1.2 Table 4.8-1. No unavailability time is associated with this failure.

On 05/01/94, Operations (OPS) started DG 2A for its TS required 24 hour outage run. At approximately 1230 hours (six hours into this run), the engine tripped on high vibration. Work Order #94033888-01 was initiated for Instrument & Electrical (IAE) to investigate and repair the cause of the trip. IAE checked the four vibration sensors mounted on the engine to determine which one had actually caused the engine trip. It was discovered that the sensor for the right turbocharger was the one that had actuated. Ops started and loaded the engine in order for IAE to determine if the sensor was correctly set. In addition, the site vibration analysis group was going to take measurements to determine if the actual vibration problems existed at the right turbocharger. The engine ran loaded for approximately one hour and it was determined the setting for the sensor was acceptable per the calibration procedure IP/2/3681/01A (Diesel Generator 2A Non Emergency Trips). The vibration readings taken were also found to be normal and indicated no problem with the turbocharger. The sensors were recalibrated to slightly less sensitive settings that would prevent trips on spurious vibration transients. The sensor was rechecked to ensure that it would still trip on a valid vibration problem. The engine was restarted and successfully completed the 24 hour run.

There have been problems in the past related to the setting of the DG vibration switches mounted on the turbochargers. Due to the nature of the turbocharger mounting, a higher ambient vibration level is expected that on the engine block. Any small amount of vibration at any point on the engine will be amplified at the turbocharger. This makes it extremely difficult to find the normal vibration level. Spurious vibration transients which are not considered threatening to the engine are continuously seen during engine runs. The calibration procedure for the vibration switches specifies that the normal vibration level be found and then turn the sensitivity adjustment back one half turn from there, which is equivalent to 1/2 g of protection. This calibration procedure was based on the information provided in vendor literature provided for the Robert Shaw Model #366 vibration switch. However, the Cooper-Enterprise R4/RV4 Instruction Manual for Nuclear Standby Applications, Section 5, Supplement on Preventative Maintenance Plan states that "engine and turbo vibration switches are intended to stop the unit AFTER a catastrophic event. They are NOT capable of detecting small changes in unit vibration and should not be used as monitoring devices. More sophisticated equipment is required.: Cooper recommends that the sensor be set at a point greater than 2 g's past normal vibration up to 5 g's, as long as the sensor will still trip when an area adjacent to the switch is pinged with a hammer. Based on this new information, procedure changes were made to the calibration procedures for all four DGs, IP/1(2)/3681/01A(01B), to incorporate this more appropriate method of setup. The Unit 2 DGs will be reset using this new method during the present 2EOC6 outage per their outage required predefined work orders. DG 1B vibration switches were reset per work order #94035389-01 on 05/10/94. DG 1A vibration switches will be reset

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during the next monthly run per work order #94035380-01. Resetting all the vibration switches according to the new guidance should eliminate any future spurious trips on high vibration.

The trip for high vibration is not an emergency trip function and would have been bypassed had an emergency start signal been received. The inadvertent actuation of this switch would not have affected the ability of the engine to start and accept loads had it been needed for a design basis event. Therefore, this event is classified as an invalid failure.

On 05/01/94 at 1540, DG 2A was started (Start #809) per procedure. This start attempt was declared a valid success and DG 2A was declared operable.