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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 Failures of Diesel Generator 1B

Pursuant to Technical Specification 4.8.1.1.3 and 6.9.2, find attached a Special Report concerning four invalid failures on Diesel Generator 1B. Two of these failures occurred on May 16, 1991 and the other two occurred on May 18, 1991.

Very truly yours,

M. S. Tuckman

CRL/SR61291

Attachment

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SPECIAL REPORT

CATAWBA NUCLEAR STATION

DIESEL GENERATOR 1B INVALID FAILURES DURING MAINTENANCE TESTING OF THE ENGINE

Four invalid failures occurred on Diesel Generator (D/G) 1B during May, 1991. At the time of the invalid failures, Unit 1 was in Mode 5 during outage number 5 (1EOC5). Catawba Technical Specifications require that only one D/G be OPERABLE in Mode 5. Since the 1A D/G was OPERABLE, the 1B D/G was not required during this time. Therefore, there is no unavailability time associated with these invalid failures. Two invalid failures (start No's 934 and 935) of D/G 1B occurred on May 16, 1991. The third and fourth invalid failures occurred on May 18, 1991 (start No's 941 and 942). All of the invalid failures occurred during the Maintenance testing Breakin procedure. D/G 1B was on a monthly operability test schedule at the time of these invalid failures. There have been 0 valid failures in the past 20 valid starts and 2 valid failures in the past 100 valid starts for D/G 1B. The D/G remains on a 31 day operability schedule per Technical Specification 4.8.1.1.2, Table 4.8-1.

The first invalid failure occurred during the first start of the Maintenance Testing Breakin Run, Procedure MP/O/A/7400/13. The start of the D/G appeared normal in all respects. Approximately 2 minutes into the start, the D/G shutdown when control air pressure dropped below the shutdown set point.

A second start (start #935) for testing was conducted with IAE observing the pneumatic instrumentation. Approximately 2 minutes into the start, the D/G shutdown when control air pressure dropped below the shutdown set point. The test indicated that the pneumatic control devices were not charging.

IAE inspected and tested the pneumatic shutdown sensors in search of a possible fault that would have caused the engine to shutdown. They found the instrument tubing to the turbocharger high vibration sensor reversed at the sensor. This reversal prevented the system from pressurizing because it was continually venting. No other abnormal system configurations were found.

The reversed tubing was reinstalled in the correct configuration. To prevent reoccurrence, metal identification/positioning tags have been installed in place of paper tags in this area. Metal tags are now on all engines in this area.

The D/G was restarted and successfully completed all loaded runs of the Modified Breakin procedure. The final step of the procedure requires a start and idle run to collect cold compression data. The governor was set to achieve a slow start. The slow start is used to minimize the high starting stresses on the engine during all maintenance starts. During the slow start, (start # 941 5/18/91) the start timer ran out causing a fail to start signal which shut down the engine. The slow start time slightly overlapped into the start timer tolerance causing the shutdown.

The governor slow start time was reset and D/G start # 942 was attempted. The engine rolled on air, the fuel racks were full open, but the cylinders were not getting sufficient fuel to support the start. Procedures were drawn to inspect and clean or change, as necessary, both fuel strainer elements.

Inspection of the in service fuel strainer proved it to be nearly clogged. The off service strainer as expected, was clean and showed no debris. The in service fuel filter was then examined and found to be clean with no evidence of any debris.

The fouled strainer was replaced with a new one from spares and the D/G was successfully restarted. The final step of the breakin procedure, cold compression data collection, was performed and the D/G shut down.

Both 1B fuel storage tanks and the day tank had been cleaned this outage. The only area that was not cleaned was the piping from the storage tanks to the day tank. The day tank had been drained and refilled twice following its cleaning. The refilling flow rate is much greater when the tank is empty than when in a normal full condition. The two fast refills flushed existing debris from the piping into the day tank. No time was allowed for settling, and, therefore, the debris was carried into the strainer.

Performance then conducted their required after maintenance testing without incident.

The D/G was started, fully loaded and commenced its 24 hour run that carried out to approximately 30 hours. The in service strainer was then removed and inspected. The in service strainer had only normally appearing deposits present. The strainer was cleaned and reinstalled.

Total time accumulated on the strainer at the time of this inspection was in excess of 40 hours. These hours include approximately 10 fast starts which require a high fuel demand versus a steady state smaller fuel consumption.

Operations then performed the Operability PT and declared the D/G "Operable".