

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 11) Verifying that the fuel transfer valve transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines;
 - 12) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within the tolerances given in Table 4.8-2;
 - 13) Verifying that the voltage and diesel speed tolerances for the accelerated sequencer permissives are $92.5 \pm 1\%$ and $98 \pm 1\%$, respectively, with a minimum time delay of 2 ± 0.2 s;
 - 14) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Maintenance mode; and
 - 15) Operating at greater than or equal to 5600 KW but less than or equal to 5750 KW for one hour or until operating temperature has stabilized. Within 5 minutes after completing this test, perform Specification 4.8.1.1.2g.6)b).
- h. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 441 rpm in less than or equal to 11 seconds; and
- i. At least once per 10 years by:
- 1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution or its equivalent, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.
 - 3) Performing tank wall thickness measurements. The resulting data shall be evaluated and any abnormal degradation will be justified or corrected. Any abnormal degradation will be documented in a report to the Commission.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported in a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests ~~for~~

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of any diesel generator

~~a per nuclear unit basis~~) is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

TABLE 4.8-1
DIESEL GENERATOR TEST SCHEDULE

<u>NUMBER OF FAILURES IN LAST 20 VALID TESTS*</u>	<u>NUMBER OF FAILURES IN LAST 100 VALID TESTS*</u>	<u>TEST FREQUENCY</u>
≤ 1	≤ 4	At least once per 31 days
$\geq 2^{**}$	≥ 5	At least once per 7 days

*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, but determined on a per diesel generator basis. For purposes of this schedule, only valid tests conducted after the completion of the preoperational test requirements of Regulatory Guide 1.108, Revision 1, August 1977, shall be included in the computation of the "last 20/100 valid tests."

For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if a complete diesel overhaul to like-new condition is completed, provided that the overhaul, including appropriate post-maintenance operation and testing, is specifically approved by the manufacturer and if acceptable reliability has been demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests in a single series. Ten of these tests shall be in accordance with the routine Surveillance Requirement 4.8.1.1.a 4) and 4.8.1.1.2.a 5), four tests, in accordance with the 184-day testing requirement of Surveillance Requirements 4.8.1.1.2.a 4) and 4.8.1.1.a 5). If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to transvalue the failure count to zero requires NRC approval.

**The associated test frequency shall be maintained until seven consecutive failure-free demands have been performed and the number of failures in the last 20 valid demands has been reduced to less than or equal to one.

* A one-time waiver to the requirement for performance of a complete diesel generator overhaul to like-new condition has been granted in order to rezero four failures of diesel generator 1A which occurred on April 12, 1988, April 19, 1988, April 25, 1988 and May 5, 1988. These failures resulted from faulty pressure sensors in the diesel generator pneumatic control system.

Attachment 2

Discussion, No Significant Hazards Analysis and
Environmental Impact Statement

The proposed amendment would:

- (1) Allow a one-time waiver to the requirement for a complete D/G overhaul to discount failures.

This waiver will be for pressure sensor problems discovered on D/G 1A.

- (2) Change the counting of failures on the Diesel Generators (D/Gs) from a "per nuclear unit basis" to a "per diesel generator basis" as stated in 4.8.1.1.3.

Each unit at Catawba Nuclear Station has two independent diesel generators manufactured by IMO Delaval, Incorporated. These D/Gs are used to provide an emergency standby source of power to the equipment required to safely shutdown the reactor in the event of a loss of offsite power.

Each D/G is controlled by a separate 60 psi pneumatic control system that will trip the engine when the setpoints of various parameters are reached. This process is achieved by the venting of sensors causing the pneumatic shutdown logic board to initiate a shutdown signal. Trips are divided into Group I and Group II trips. Group II trips are locked out for a period of 60-90 seconds from engine start to allow time for certain engine parameters to reach their normal operating state. On an emergency start, all trips are blocked except lo lo lube oil, overspeed and generator differential. Lo Lo lube oil trip is a Group II trip. It is blocked, even on an emergency start, for 60-90 seconds, then it is activated. This blocking is obtained by use of the P3 pressure sensor which is in line with the lo-lo lube oil sensors. On an engine start, P3 is pressurized and blocked via port 9 of the logic board. This allows time for the lo lo lube oil sensors to block and its tubing line to pressurize. This pressure should hold P3 pressurized when port 9 pressure is lost after the 60-90 second lockout period is terminated. If process pressure to P3 is not obtained or is lost, P3 will vent and the engine will trip when the lockout period is over.

All the sensors on the engine and P3 in the control panel are manufactured by California Controls Company, Inc. (Calcon). A total of seven of these sensors are of one particular model #: Calcon B4400 (Delaval part # F-573-156). These sensors are used in the following locations: 3 lo lo lube oil trips, lo lube oil trip, 2 turbo lube oil trips, and P3 pressure sensor.

The last four valid failures of D/G 1A can be attributed to the failure of this Calcon B4400 pressure sensor. These failures took place on April 12, 1988, April 19, 1988, April 25, 1988 and May 5, 1988. More information relating to the specifics of these failures can be found in my May 25, 1988 letter.

Following the May 5, 1988 failure, it was discovered that because of a tolerance stack-up in the manufacture of the sensor, the pressure sensing diaphragm can be held solid against the pressure head, thus creating a smaller surface area. This smaller surface area would require a much higher pressure to reset the sensor.

DISCUSSION, NO SIGNIFICANT HAZARDS ANALYSIS AND ENVIRONMENTAL IMPACT STATEMENT

Calcon remanufactured the pressure head on the new sensors to add an additional 1/8" diameter circular bore .030" deep, to provide a positive gap between the head and the diaphragm. The new sensors have been stamped P/N B4400B to distinguish them from the questionable sensors. All Calcon B4400 sensors were replaced on D/Gs 1A, 1B, 2A, and 2B with Calcon B4400B sensors.

Based on the discoveries made by Calcon, it is concluded that the 6th, 7th, 8th, and 9th valid failures within the last 100 valid starts on Unit 1A D/G are attributed to the same root cause: inadequate design and manufacture of the Calcon Model B4400 pressure sensor. The inadequacies of the Calcon sensors was reported by IMO Delaval, Inc. in accordance with 10CFR21 by letters dated April 29, 1988 and May 12, 1988. A thorough description of the failure of the Calcon sensors and Duke Power's actions to ensure continued reliability of the diesel generators at Catawba was presented to Region II and NRR personnel in Atlanta, Georgia on June 9, 1988. Since replacement of all the Calcon B4400 sensors with B4400B sensors, no further valid failures of any of Catawba's D/Gs has occurred. Since the May 5, 1988 failure, Diesel Generator 1A has had 32 valid successful starts. All of these starts, except one, were conducted in accordance with the routine surveillance requirements 4.8.1.1.2.a.4) and 4.8.1.1.2.a.5). The remaining start was performed in accordance with 184-day testing requirement of surveillance requirements 4.8.1.1.2.a.4) and 4.8.1.1.2.a.5). This testing demonstrates the reliability of diesel generator 1A since the changes were made to its pneumatic control system.

The proposed changes to Technical Specification 4.8.1.1.3 changes the reporting requirement from a per nuclear unit basis, to a per diesel generator basis. Test failures are already determined on a per diesel generator basis as discussed in the footnote to Table 4.8-1. The purpose of this footnote to Table 4.8-1 is to avoid excessive testing of all diesel generators due to failures experienced on one diesel generator. The reporting requirement is being changed to a per diesel generator basis to be consistent with the testing criteria, and to avoid the need for a dual counting system, one for determining test frequency and one for determining reports. The testing frequency determination assures that a reliability of 95% is maintained.

10 CFR 50.92 states that a proposed amendment involves no significant hazards considerations if operation in accordance with the proposed amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) Involve a significant reduction in a margin of safety.

The proposed amendment to allow a one time waiver to discount failures associated with the Calcon pressure sensors does not involve a significant increase in the probability or consequences of an accident previously evaluated. If the four failures added as a footnote to Table 4.8-1 for D/G 1A are not counted towards

determining the testing frequency for D/G 1A, then the test frequency would be "at least once per 31 days". Since the new pressure sensors have been tested, their installation was approved by the manufacturer and acceptable reliability of D/G 1A has been demonstrated, this amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed amendment should increase the reliability of the Diesel Generator 1A since it will reduce the wear and tear on D/G 1A associated with frequent testing.

The proposed amendment to modify the reporting requirements does not involve a significant increase in the probability or consequences of an accident previously evaluated. The purpose of this amendment is to make the reporting requirements consistent with the testing requirements and to avoid having to keep up with one set of numbers for testing and another set for reporting.

Neither of the proposed changes will create the possibility of a new or different kind of accident from any accident previously evaluated. The change allowing discount of the four pressure sensor failures creates no new accident possibilities. The diesel generators will continue to function as before and there is no change to their function in mitigating design basis events. The change to the reporting requirements will not affect the operation of the diesel generators, therefore can not create any new or different kind of accident.

Neither of the proposed changes will involve a significant reduction in a margin of safety. No functional change is being made to the D/Gs. The new pressure sensors installed have increased the reliability of the D/Gs. Therefore, allowing the testing frequency reduction will not involve a significant reduction in any margin of safety. The change to the reporting requirements will not affect the operation of the diesel generators, therefore can not create a significant reduction in a margin of safety.

Environmental Impact

The proposed Technical Specification change has been reviewed against the criteria of 10 CFR 51.22 for the environmental considerations. As shown above, the proposed change does not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor increase individual or cumulative occupational radiation exposures. Based on the foregoing, the proposed Technical Specification change meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.