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SUBJECT: Discusses emergency diesel generator vendor recommendations re slow speed start & barring-over of engine.

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
EMERGENCY DIESEL GENERATOR VENDOR RECOMMENDATIONS

Gentlemen:

At a meeting at NRR headquarters in December 1988, Carolina Power & Light Company (CP&L) informed the NRC staff of plans regarding implementation of vendor recommendations affecting the Emergency Diesel Generators (EDG). These vendor recommendations pertain to implementation of a "slow speed start" procedure during routine surveillance and the "barring-over" of the engine following operation. The purpose of this letter is to formally document CP&L's understanding resulting from that discussion with the staff.

Both vendor recommendations (discussed in more detail in the attachment) involve short periods of time when the EDG, while under operator control, will be unable to automatically assume full load. The first recommendation calls for a slow speed start, where the governor speed control is manually reduced to start the engine at reduced speed (approximately 450 rpm), followed by a slow increase to full speed (900 rpm). The second recommendation requires that the engine be barred-over to clear the cylinders of lube oil following operation and shutdown. This operation is accomplished by tripping the fuel racks (which inhibits auto start) and rolling the engine a few revolutions with starting air.

Modifications have been installed and procedures have been developed and are now ready for implementation. Implementation of these recommendations will not require change to Technical Specifications (TS) since the current monthly surveillance requirement (TS 4.6.1.1) imposes no fast start or timing. The refueling internal surveillance test (TS 4.6.1.2) requires a fast start and the timing of load assumption. However, the fast start sequence during surveillance testing will be performed semiannually to provide greater assurance of proper functioning.

As discussed at the meeting, it is our position that the EDGs should not be considered inoperable during these short periods because the evolutions are performed as part of a routine approved surveillance procedures in conformance with the vendor's recommendations. Additionally, each evolution will be conducted by a qualified operator who is in communication with the control room and who can quickly restore the EDG to service if needed.

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It is our understanding from the meeting that the NRC staff concurs with this position. This letter formally documents that understanding. Absent any feedback from the NRC staff, CP&L will within 30 days implement these recommendations which are intended to further improve Emergency Diesel Generator reliability.

If you have any questions, please contact my staff.

Yours very truly,

L. I. Loflin
Manager
Nuclear Licensing Section

RWP/crs (349CRS)

Attachment

cc: Mr. S. D. Ebneter
Mr. L. Garner (NRC - HBR)
Mr. R. Lo

FAIRBANKS-MORSE

EMERGENCY DIESEL GENERATOR

VENDOR RECOMMENDATIONS

1. Emergency Diesel Generator Slow Speed Start

A. Purpose: The purpose of the slow speed start is to improve EDG reliability by minimizing bearing damage that occurs during EDG start-up for surveillance tests. The load on engine bearings is a function of the square of the speed, so a start at one-half normal speed (approximately 450 RPM vs. 900 RPM normally) will produce one-fourth the bearing stress. Slow start of the engines during surveillance tests is in response to a manufacturer's recommendation as stated in an August 1986 letter from "Fairbanks Morse Engine Division of Colt Industries" Titled "Recommended Maintenance and Surveillance Testing Program."

The slow speed start of Fairbanks Morse Diesel Generators (for surveillance testing) is supported by the NRC as stated by Mr. James Knight (Section Chief, Elec. Systems, NRC) at an INPO Diesel Generator Conference in San Antonio, Texas in August 1987, and as stated by Mr. Edward Tomlinson (Project Engineer, NRC) at the Fairbanks Morse Owners Group Meeting in Red Wing, Minnesota in May 1989.

B. Description: Slow speed start will be used for all EDG surveillance tests with exception of: (1) when the other EDG is out of service and (2) at least once semiannually, a fast start will be performed. Following is a summary of the sequence to initiate a slow speed start:

- Take local control of EDG (inhibits auto start)
- Lower governor speed to minimum (approximately 450 RPM)
- Prelube engine (approximately 4.5 minutes)
- Start engine (local start pushbutton)
- Push voltage shutdown button (prevents damage to voltage regulator during reduced RPM operation)
- Increase engine speed 900 RPM (approximately 2 minutes)
- Reset voltage shutdown (engine now capable of assuming full load)
- Adjust engine speed to 60 hertz
- Place local/remote switch in remote

II. Emergency Diesel Generator Post Operation Barring

A. Purpose: The purpose of post-operation barring of the EDGs is to minimize diesel exhaust system fires that may occur as a result of lube oil trapped above the upper pistons after a surveillance test. If this trapped oil is not removed by barring (or rolling over the engine), over a period of hours it seeps past the piston rings and into the exhaust manifold. This oil could then ignite during subsequent EDG operation, contributing to excessive exhaust temperature entering the turbochargers. The barring of engines after surveillance tests is in response to a manufacturer's recommendation as stated in an August 1983 letter from Fairbanks Morse Engine Division, to all Nuclear Power Plants with F-M Diesels, Titled "F-M 8 1/8 x 10 O.P. Diesel Generator Sets."

B. Description: Engine barring will be performed after surveillance tests. Following is a summary of the sequence to be followed when barring the EDG:

- Engine to be stopped for approximately fifteen minutes
- Take local control of EDG (inhibits auto start)
- Isolate main bearing oil booster air line
- Isolate governor servo booster air line
- Trip fuel rack
- Push local start pushbutton and hold for two seconds (rolls engine)
- Open main bearing oil booster air line
- Open governor servo booster air line
- Reset the fuel rack
- Place LOCAL/REMOTE switch in REMOTE

NOTE: Equipment restoration actions are independently verified.