ENCLOSURE 4

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April 17, 1984

Mr. Carl Berlinger
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Berlinger:

SUBJECT: GRAND GULF NUCLEAR POWER STATION STANDBY DIESEL GENERATORS

This letter is in response to your request for clarification of several issues addressed in PNL's letter of April 16, same subject.

1. Question: What is the rationale for rolling over the engine once per hour (with the indicator cocks open) during the furst four hours after shutdown? Would it be acceptable to roll the engine after four-to-eight hours, and then once a day?

   Response: Rolling the engine once per hour in the first four hours after shutdown would provide additional assurance that the engine is ready for an emergency start. If a crack formed in a cylinder head during engine operation and provided a path for water to enter a cylinder after shutdown, that water could damage the engine in an emergency start (and possibly prevent the engine from starting). It would be desirable to detect such leakage early.

   As an engine cools down and metal contracts in the vicinity of a flaw, the likelihood of water leaking through the flaw increases. It is acceptable from the standpoint of the engine to roll it over four-to-eight hours after shutdown to detect leakage, followed by a rollover once per day. The increased frequency during the first four hours is a suggestion only, to provide the additional assurance referred to above.

2. Question: What is the basis for the comment (in response to question 3 of the enclosure to the PNL letter of April 16) that random checks be performed of certain components?

   Answer: Our response regarding random checks assumes that no engine is completely disassembled and inspected. It is not the recommended approach. Our consultants agree unaminously that one engine should be completely torn down and inspected. Action on the second would be contingent on findings in the first.

   Engine Recommended for Teardown: In our letter of April 16, we overlooked

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documenting our recommendation that the complete disassembly and inspection be performed on the engine that has been operated the most hours.

3. Question: Are the instrumentation, monitors, and alarms listed in response to question 4 (PNL letter of April 16) in place in nuclear plants, and if not are they absolutely necessary?

   Response: The time in which we have prepared this response has not permitted us to determine the instrumentation actually in place for these engines. However, it is customary for engines of this size in non-nuclear applications to be instrumented and monitored for the pressures and temperatures discussed in our letter of April 16. Automatic monitoring accompanied by appropriate alarms will notify the operator of engine distress, so that timely action can be taken to shut down the engine during a test or transfer its load to another standby engine during an emergency.

   Accelerometers might not be installed on main bearings, for bearing temperature rather than bearing vibration is normally monitored in large diesel engines. The accelerometers are not considered to be a necessity. If they are installed, they should be monitored.

   We believe that surveillance of the type we have suggested is necessary, but details of how this surveillance can best be accomplished in a nuclear power plant are negotiable.

4. Question: What is the rationale for the additional preoperational tests outlined in response to question 5 (PNL letter of April 16)?

   Response: The twelve starts (10 "modified" starts plus two "quick" starts), and the 24-hour run, are suggested as one way to provide confidence that an engine will perform its mission following reassembly. The start tests are suggested in the light of the emphasis placed on engines in nuclear service to start reliably. A continuous run for some appropriate time is necessary to detech abnormal temperatures and/or temperature excursions that might indicate engine distress. If the post-assembly tests recommended by the manufacturer provide appropriate coverage of these considerations, they should take precedence.

5. Question: Is the assumption of operating with emergency loads only (approximately 68% of full load) during the period to first refueling an important consideration in the comments provided by PNL? (Would these comments change if the engine were allowed to operate with additional, non-essential loads that would increase overall engine load toward 100%?)

   Response: There are several key components in question that are s·

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to stresses in direct proportion to engine load. Accordingly, restricting the engines to emergency loads only provides greater confidence that the engines will meet emergency requirements. We believe it would be prudent to invoke this restriction.

Please do not hesitate to call if you have any questions on this letter.

Sincerely,

Walter W. Laity
PNL Project Manager

WWL:wl

cc: M. Plahuta, DOE-RL