



Battelle

Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington U. S.A. 99352
Telephone 375-2514
Telex 15-2874

May 21, 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: Technical Basis for Recommendation That At Least One TDI
Engines at Grand Gulf Should Be Disassembled and
Inspected.

Reference: 1) Mississippi Power and Light (MP&L) submittal to
Mr. Harold R. Denton dated May 6, 1984.
2) PNL Review and Evaluation of TDI Diesel Generator
Owners' Group Program Plan dated May 1984 (draft).

PNL and its consultants have reviewed the reference submittal and
other submittals from MP&L dealing with the TDI engines at the
Grand Gulf Nuclear Power Station. Two underlying concerns
dominate our present position; they are:

1. The recent inspection of the TDI engine following 795 hours
of operation on Division 1 and 655 hours on Division 2 were
not adequate to determine potential problems. Specifically,
visual inspections were employed to detect defects in
critical components (conrods, bearings, bushings, engine
block, etc.).
2. There is not convincing evidence that results of the
inspection of the TDI engine at the Catawba Nuclear Power
Station are applicable to the engines at Grand Gulf. This
conclusion stems from the absence of QA/QC records to
confirm the comparability of the engines at Catawba and
Grand Gulf.

We are therefore in a position of evaluating an "uninspected"
engine for licensing without that engine being either a lead or
following engines (see Reference 2, Section 2.1 and 2.3).

The areas of significant uncertainty that exist are listed below:

- o Wrist Pin Bushings - There were casting defects noted in
bushings used (and supplied to) the Shoreham Nuclear

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Station. It is possible that defective bushings have been installed at Grand Gulf. The inspection provided is not adequate to rule this out. Further, compression failure of the bushings into the clearance space is possible. Such a failure can lead to engine shutdown.


- o Connecting Rods - The inspection given to the conrods was insufficient to determine if cracked rods were replaced in the Grand Gulf engines. These rods had operated for several hundred hours prior to the design change requiring bolt modification and the TDI SIM 64 to rectify the suspected clamping force problem (retorquing). We note also that MP&L did not implement the bolt diameter design change.
- o Engine Base - The FaAA conclusions on the inline units do not adequately address the narrow margin they calculate between crankshaft lateral forces (which may be greater in V-engines) and the bearing cap hold down/immobilization forces. In the absence of an Owners' Group submittal on the problem for "V" engines or an adequate inspection by MP&L, this area remains unresolved.
- o Engine Block - The MP&L belief that cracks are inconsequential and stable is not shared by the PNL consultants. Recent findings at Shoreham raise new concerns on the problem. The FaAA explanation of temperature contrast between liners and blocks on quick starts is not fully credible; these units reportedly are kept warm via jacket water circulation at all times, whereas most stationary units are not. Yet there are no reports from these latter units of comparable problems.
- o Heads - The results of the Owners' Group investigation are not complete. MP&L evaluates the likely cause of failure as quick starts; this reinforces the present concerns of the PNL consultants. Prolonged use without failure in other applications does mitigate this concern.
- o Main Bearing - The photographic inspection data provided by MP&L at our May 15 meeting were inconclusive concerning torsional load induced pitting.
- o Turbocharger - Pre- and port-operational lube system has not been confirmed to be adequate.



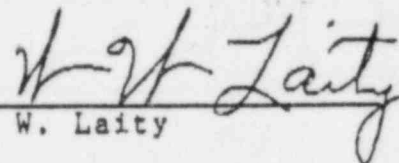
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I hope this information is sufficient for you to communicate our concerns to MP&L and to establish with them the need for a full inspection of one engine to the Owners' Group specification. We believe that the need for disassembly and inspection of the second engine will depend on the findings for the first.

Sincerely,


D. A. Dingee
PNL Diesel O/R Project

Concurrence:


W. W. Laity

DAD:ri

cc: M. Plahuta, DOE/RL
M. Williams, NRC
M. Carrington, NRC (2)