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October 9, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Regarding: Catawba Nuclear Station, Unit 1
Docket No. 50-413, 50-414
Resolution of Outstanding Items on Diesel Generators

- References:
- 1) NRC letter to H. B. Tucker, DPC from T.M. Novak of August 14, 1984.
 - 2) Safety Evaluation Report Catawba Nuclear Station Unit 1-Reliability of Diesel Generators Manufactured by Transamerica Delaval, Inc. - TDI Project Group Division of Licensing.
 - 3) PNL Report PNL-5211, "Review and Evaluation of Transamerica Delaval, Inc., Diesel Engine Reliability and Operability - Catawba Nuclear Station Unit 1", August 1984.
 - 4) Duke Power Co. letter to H. R. Denton, NRC from H. B. Tucker of July 16, 1984.
 - 5) Duke Power Co. letter to H. R. Denton, NRC from H. B. Tucker of August 28, 1984.
 - 6) Duke Power Co. letter to H. R. Denton, NRC from H. B. Tucker of July 6, 1984.

Dear Mr. Denton:

The purpose of this letter is to reply to a verbal commitment to answer a question made during the July 26, 1984 meeting with NRC, Battelle PNL and Duke and to answer outstanding items on the Catawba Unit 1 diesel generators mentioned in reference 2 which was forwarded to Duke Power Co. by reference 1. Resolution of the outstanding items described in reference 2 are required prior to operation above 5% power. The following is Duke Power Company's response to the July 26 question and resolution of the items discussed in reference 2.

1. Lube Oil Pressure and Temperature
During the July 26, 1984 NRC Duke meeting at Catawba Nuclear Station

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the staff expressed a desire that the lubricating oil pressure be increased to the highest maximum value allowed by TDI. In an August 24, 1984 letter to the Owners Group, TDI advises that RV engines be operated at oil inlet pressures between 50 and 60 PSIG. We are currently changing the necessary station documents and adjusting the necessary equipment to allow engine operation in the upper portion of this range (approximately 57 PSIG). The staff also suggested that the lubricating oil inlet temperatures be reduced to the lowest value allowed by the manufacturer in an effort to reduce bearing babbitt fatigue. TDI warns that reducing the temperature below that recommended in the operating manual (170 to 180 deg. F) allows water to build up in these systems, causing an adverse affect on the lube oil additives. Therefore they do not recommend that lower temperatures be used. Because we have no contradicting information, we feel that we should follow their recommendation.

2. Turbocharger Adapter

Both Unit 1 diesels have had modifications made to the turbocharger adapters on the right bank of the engine. These modifications include a flexible joint between the adapter and turbocharger to absorb relative displacements between the turbocharger and adapter and the addition of strongbacks to the adapter casing to reduce casing displacements.

3. Turbocharger Bearings

Both Unit 1 diesels have had modifications made to the turbocharger prelube system which will reduce wear on the turbocharger bearings during startup of the units. To confirm this reduction in wear, Duke Power Co. will inspect at least two turbochargers for bearing wear at the first refueling.

4. Diesel 1A Cylinder Head 6L

Duke Power Co. has replaced cylinder head 6L on diesel 1A as we believe that this head had a plug repair weld in the fuel injector nozzle cavity. No heads on either Unit 1 diesels will be returned to service with plug repair welds.

5. Jacket Water Pump Impeller Nut

Duke Power Co. will measure the torque of the jacket water pump impeller nut on diesel 1B at the first refueling. Reassembly procedures indicate that the torque on the diesel 1A impeller nut was 120 ft-lbs.

6. Maintenance and Surveillance Program

Reference 4 forwarded the Duke Power Co. maintenance and surveillance program for the Unit 1 diesels. Reference 2 and 3 commented on the reference 4 program. Duke Power Co. will incorporate the reference 3 comments as modified and amplified by

reference 2. We understand that this will involve the following changes to the reference 4 document:

- a. Barring over the engine 24 hours after shutdown and prior to any planned engine operation (this is in addition to barring over the engine within 4 hours of operation, as already planned).
- b. When operating, the cylinder block will be visually inspected using portable lighting. This inspection will be done at least once per month.
- c. Inspect connecting rod bolts preload at first refueling or 200 hours whichever comes first.
- d. Check lubricating oil of the engine for chemical and particulate contamination on a monthly basis for the first three months. Future testing will be determined by a review of the first three months results.
- e. Check 100% of air-start valve capscrew torques and 25% of cylinder head stud and rocker arm capscrew torques at each refueling.
- f. Measure hot crankshaft deflections as soon as possible following engine shutdown at each refueling.
- g. Continuously monitor and record at one hour intervals pre-turbine exhaust inlet temperatures during operation.
- h. Until DQ/DR resolution is obtained, inspect items on page 92 of reference 3 at first refueling except that a 25% inspection of connecting rod bearings will be done. At 500 hours or ten years whichever comes first, dimensionally, visually, and radiographically inspect all connecting rod bearings shells.
- i. At the first refueling, penetrant test the subcover pedestals on the subcovers which are removed during cylinder head inspection. This will involve a 25% inspection.
- j. At 500 hours or 10 years, whichever comes first, penetrant inspect 100% of the subcover pedestals.

7. Revised Technical Specifications

A revised technical specification limiting operation of the diesels to 5750 kw has been sent to the NRC by reference 5.

8. Revised Plant Procedures

Plant procedures have been changed to reflect the fact that the diesels are not to be loaded to more than 5750 kw.

9. Fuel Lines

Fuel line fittings on both Unit 1 diesels have been installed using Duke Power procedures for torquing to minimize leakage. Fuel line walkdowns of both Unit 1 diesels have been completed with satisfactory results. All fuel lines on both Unit 1 diesels have been eddy current tested with satisfactory results.

10. Fuel Injection Pump Valve Holders
All valve holders on both Unit 1 diesels have been cleaned, boroscope inspected, reamed where necessary to remove indications, and found to be satisfactory.

11. Turbocharger Gas Inlet Bolts
All turbocharger gas inlet bolts on the 1B diesel have been replaced by SA 453, Grade 660, Condition A material. Due to scheduler constraints, the 1A diesel inlet bolts were replaced with TDI spare bolts. Duke Power Co. will replace these bolts with SA 453, Grade 660, Condition A bolts at the first refueling when two turbochargers have to come off an engine for bearing inspection (see item 3). Our rationale for postponing this retrofit is that at the first refueling the engine will only have about 50 hours on it. We believe that these hours will not create a creep rupture failure of the type seen on the 1A engine after about 420 hours of operation.

12. Rocker Box Subassembly Pedestals
Failure analysis of the rocker box pedestals has confirmed that the cracks were due to overload and not due to fatigue. This indicates that the cracks were caused by manufacturing and/or installation error, and not due to service. Thus, recurrence of these cracks is not expected. However, as a precautionary measure, 4 rocker boxes will be inspected at the first refueling, and all of them will be inspected as discussed in item 6.j. about every 500 hours or 10 years, whichever comes first.

13. Return-to-Service Testing
All return-to-service testing as indicated in reference 6, has been completed for engine 1A at loads of 5750 kw or less in accordance with section 3.3 of reference 2. In addition, reference 6 indicated that the Fast Start Test under blackout conditions would load a diesel to 4100kW. However plant conditions did not allow this much load. The automatic load sequencer placed a load of about 2950kW on each diesel during the blackout test. We believe that the Fast Start Test has fully duplicated the testing required by the Catawba technical specifications and assured that the diesel generator controls are capable of stably controlling the unit for the actual load ramps found under blackout conditions. Return-to-service testing has been successfully completed on engine 1A diesel generator. Information on engine 1B return-to-service testing will be forwarded as soon as testing is complete.

14. Owner's Group Recommendations
Duke Power Co. will incorporate all owners group recommendations applicable to the Catawba diesels which are accepted by the NRC staff in conformance with Section 3.5 of reference 2.

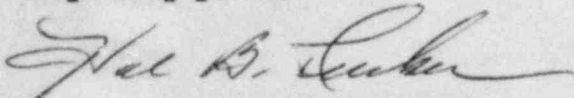
15. Turbocharger Inlet Temperatures

Duke Power Co. has completed turbocharger inlet temperature tests on engine 1B. Results of these tests are summarized in the table below. Shown are load, average right bank and left bank exhaust temperatures, and right and left bank turbocharger inlet temperatures.

LOAD (kW)	LEFT BANK		RIGHT BANK	
	Avg. Exhaust Temp (deg F)	Turbo Inlet Temp (deg F)	Avg. Exhaust Temp (deg F)	Turbo Inlet Temp (deg F)
1750	723	746	707	734
3500	859	933	821	913
5200	914	1027	886	1016
5750	929	1048	906	1038

If you have any questions or comments please do not hesitate to call Russell P. Muschick at (704) 373-5875.

Very truly yours,



H. B. Tucker, Vice President
Nuclear Production Department

HBT:WWG:wwg

cc: NRC Resident Inspector
Catawba Nuclear Station

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