

DUKE POWER COMPANY

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July 6, 1984

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

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

Re: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

Dear Mr. Denton:

The purpose of this letter is to submit Duke Power Company plans for the inspection of the Catawba 1B diesel engine and the return to service testing of the Catawba 1A engine following reassembly after inspection. The Duke Power Company plans for these two items appear below:

A. Catawba 1B Diesel Engine Inspections

Our letter of April 5, 1984 forwarded a report entitled "Catawba Nuclear Station Extended Operation Tests and Inspections of Diesel Generators." Section 6 of this report noted that the extent of inspections to be carried out of the Catawba 1B diesel would be based upon the results of the Catawba 1A diesel inspections and other TDI emergency diesels. The Catawba 1A diesel inspections are now complete. The Catawba 1A diesel inspection results as well as the Owners Group inspection requirements for the second diesel at a nuclear station have been reviewed and an inspection plan matrix for the Catawba 1B diesel has been developed from this review. The Catawba 1B inspection plan matrix is shown in a revised Table 5-1 to the above mentioned report and is included as an enclosure to this letter. Referring to the revised Table 5-1, sample size of components to be inspected on the Catawba 1B diesel will be the same as the Catawba 1A diesel except as noted by parentheses. Where parentheses are included, sample size of inspection for the Catawba 1B diesel appears in the parentheses.

B. Catawba Diesel 1A Return to Service Testing

In accordance with a commitment made in "Catawba Nuclear Station Diesel Engine 1A Component Revalidation Inspection, Final Report," of June 29, 1984, the following is the Duke Power Company plan for return to service testing of the Catawba 1A diesel.

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1. Run-In Operation:

This will be in accordance with TDI Instruction Manual, Chapter 6, Part C (page 6-C-18). The runs are mainly for seating new rings in the cylinder liner and consist of running the engine at various speeds and loads, inspections of the engine following various runs, hot crankshaft web deflection checks, and cold compression checks. In addition, during these runs, control systems, vital engine parameters, and auxiliary services will be monitored to assure proper operation.

2. Modified Load Tests:

Ten modified load tests will be run at a load of at least 3500 KW. Pertinent parameters that will be adhered to are as follow:

- a. A test will be of one hour minimum duration followed by at least one and a half hours with the engine secured prior to the next modified load test.
- b. All test starts will be performed with a pre-lube of the engine.
- c. During a test, the load will be increased to a minimum of 3500 KV in a period less than five minutes.
- d. Vital engine parameters will be monitored on a fifteen minute basis during the one hour run at power to assure proper operation.

3. 24-Hour Run:

A twenty-four hour run test will be conducted. This test will consist of twenty-two hours at 7000 KW and two hours at 7700 KW. Pertinent parameters that will be adhered to are as follow:

- a. The engine test starts will be performed after the engine has been pre-lubed.
- b. During the test, all load changes will be accomplished in five minutes or less.
- c. Vital engine parameters will be monitored on a one-hour basis to assure proper operation.

4. Fast Start Test:

Two fast start tests will be conducted. Pertinent parameters that will be adhered to are as follow:

- a. Diesel engine will come up to speed and voltage within eleven seconds.
- b. Diesel engine will be loaded with accelerated blackout loads in the period of eleven seconds to thirty seconds. Peak load will be about 4100 KW. This is the highest load obtainable with the load sequencer under ESF or blackout conditions.
- c. After the engine has achieved 4100 KW, each test will last for a period of one hour followed by a shutdown of at least one and a half hours. The one hour duration at load is set so that auxiliary cooling devices will not have to be cut in for some of the respective loads which would place an undue burden on the plant for the performance of these tests.
- d. One of these tests will be conducted under pre-lube conditions. The other of these tests will be performed with the engine in ready standby status without pre-lube.
- e. Vital engine parameters will be monitored on a 15-minute basis. Further, visacorder tracings of diesel generator voltage and frequency will be made during starting and loading transients.

5. Trip Device Verification:

There are ten trips which cause the engine to shut down under normal operation and three trips which cause shutdown under emergency operation. To verify proper operation of these trip devices, shutdown from the tests outlined in B-2 through B-4 above will be accomplished by sequentially introducing these trips for each of the thirteen tests.

6. Load Rejection:

To assure that the diesel generator does not go over five hundred RPM on a load rejection of 7000 KW, visacorder tracings of frequency will be made during the trip from 7000 KW outlined in B-3 above.

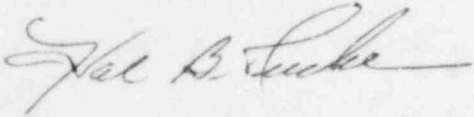
Criteria used to judge the tests outlined above as to what is a successful test, as opposed to a failed test, will be according to the following plan:

- o The operation runs outlined in B-1 above are for break-in and grooming. As such, there are not any pass/fail criteria applied to them. In addition to break-in, this run will be to assure that the diesel generator is ready for tests B-2 through B-6.
- o Tests outlined in B-2 through B-6 will be conducted in accordance with the pass/fail criteria of NRC Regulatory Guide 1.108.

Mr. Harold R. Denton, Director
July 6, 1984
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We trust the above information is keeping you fully informed of the status of the Catawba Unit 1 diesels. Please call me if I can be of any further service.

Very truly yours,



Hal B. Tucker

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cc: Mr. James P. O'Reilly, Regional Administrator
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Part Name	Part No.	Class	Dimen.	Visual	Surf. NDE	Vol. NDE	Material	Hardness	Eng	Ev	Notes
Lube Oil Pressure Regulating Valve	00-420	A	-	-	-	-	-	-	X	9	
Jacket Water Standpipe, Ftngs, Gasket	00-700A	B	-	100	-	-	-	-	-	-	
Jacket Water Standpipe Valves	00-700B	B	-	-	-	-	-	-	X	9	
Jacket Water Standpipe Supports	00-700C	B	-	100	-	-	-	-	-	-	
Jacket Water Standpipe Switches	00-700E	B	-	-	-	-	-	-	X	9	
Jacket Water Standpipe Bolting Materials	00-700F	B	-	100	-	-	-	-	-	-	
Main Bearing Cap Base Assembly	02-305A	A	-	50(0)	50(0)	-	-	-	-	-	
Main Bearing Studs and Nuts	02-305C	A	10(0)	30(0)	-	-	-	-	-	-	
Main Bearing Caps	02-305D	A	-	50(0)	50(0)	-	-	-	-	-	
Lube Oil Internal Headers	02-307A	A	-	100	-	-	-	-	-	-	
Lube Oil Tubing and Fittings-Internal	02-307B	A	-	100	-	-	-	-	-	-	
Lube Oil Line Supports-Internal	02-307D	B	-	100	-	-	-	-	-	-	
Crankshaft	02-310A	A	100	100	38(0)	-	-	-	-	-	3,4
Crankshaft Bearing Shell	02-310B	A	50(0)	50(0)	-	-	-	-	-	-	
Crankshaft Thrust Bearing Ring	02-310C	A	100	-	-	-	-	-	-	-	4
Crankcase Assembly	02-311A	A	-	100	-	-	-	-	-	-	
Cam Bearing Caps and Dowels	02-311B	B	-	-	-	-	-	-	X	9	
Crankcase Mounting Hardware	02-311D	B	-	-	-	-	-	-	X(0)	9	
Cylinder Block	02-315A	A	40(25)	-	100(25)	-	-	-	-	-	
Cylinder Liner	02-315C	A	100	100	-	-	20(0)	20(0)	-	-	
Cylinder Block Jacket Water Manifold	02-315D	B	-	100	-	-	-	-	-	-	
Cylinder Head Studs	02-315E	B	-	25	-	-	3(0)	-	-	-	
Cyl. Block Jacket Wtr. Manifold Nuts	02-315F	B	-	100	-	-	-	-	-	-	
Cylinder Block Seals and Gaskets	02-315G	B	-	-	-	-	-	-	X(0)	9	
Jacket Water Inlet Manifold Assembly	02-316A	B	-	100	-	-	-	-	-	-	
Jacket Water Inlet Manifold Coupling	02-316B	B	-	100	-	-	-	-	-	-	
Jacket Water Discharge Manifold	02-317A	B	-	100	-	-	-	-	-	-	
Jacket Water Disch. Manifold Coupling	02-317B	B	-	100	-	-	-	-	-	-	
Jacket Water Disch. Manifold Supports	02-317C	B	-	100	-	-	-	-	-	-	
Flywheel	02-330A	A	-	-	-	-	-	-	X(0)	9	
Flywheel Bolting	02-330B	A	-	100	-	-	-	-	-	-	
Front Gear Case Bolting	02-335B	C	-	100	-	-	-	-	-	-	
Connecting Rods and Bushings	02-340A	A	100(0)	100	100	-	25(0)	25(0)	-	-	
Connecting Rod Bearing Shells	02-340B	A	100	100	100	100	-	-	-	-	
Piston	02-341A	A	100(0)	100	100(0)	-	-	-	-	-	5,10
Piston Rings	02-341B	A	25(0)	100(0)	-	-	25(0)	-	-	-	11
Piston Pin Assembly	02-341C	A	25(0)	100	-	-	25(0)	25(0)	-	-	
Intake Tappets	02-345A	A	-	25	-	-	-	-	-	-	
Fuel Tappets	02-345B	A	-	25	-	-	-	-	-	-	
Fuel Pump Base Assembly	02-345C	B	-	-	-	-	-	-	X(0)	9	
Camshaft Assembly	02-350A	A	-	100	-	-	-	-	-	-	
Camshaft Bearing	02-350B	B	-	100	-	-	-	-	-	-	7
Camshaft Supports, Bolting and Gear	02-350C	A	-	100(0)	-	-	100(0)	100(0)	-	-	
Crankshaft Gear	02-355A	A	-	100	-	-	-	-	-	-	
Idler Gear Assembly	02-355B	A	-	100	-	-	-	100(0)	-	-	
Air Start Valve	02-359	A	100	100	-	-	-	-	-	-	
Cylinder Head	02-360A	B	100	100	100	100	-	-	X	2,9	
Intake and Exhaust Valves	02-360B	B	25(0)	100	-	-	25(0)	-	-	-	

Catawba Unit 1 Diesels Inspection Plan Matrix

Sample Size, Percent of Engine Parts Inspected

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Part Name	Part No.	Class	Dimen.	Visual	Surf. NDE	Vol. NDE	Material	Hardness	Eng	Ev	Notes
Fuel Injection Tubing	02-365C	B	-	100	100	-	-	-	-	-	8
Fuel Injection Tubing Supports	02-365D	B	-	100	-	-	-	-	-	-	-
Fuel Pump Linkage and Control Shaft	02-371A	A	-	-	-	-	100(0)	100(0)	-	-	-
Fuel Pump, Linkage, Bearings and Shaft	02-371B	A	-	100	-	-	-	-	-	-	-
Intake Manifolds	02-375	B	-	100	-	-	-	-	-	-	-
Exhaust Manifold	02-380A	B	-	100	100	-	100(0)	100(0)	-	-	8
Exhaust Manifold Bolting	02-380B	B	9	9	-	-	-	-	-	-	-
Cylinder Block Cover, Gaskets and Bolts	02-385B	C	-	-	-	-	-	-	X(0)	-	9
Crankcase Cover Gaskets and Bolting	02-386B	C	-	100	-	-	-	-	-	-	-
Intake & Intermediate Rocker Arm Asmby.	02-390A	B	-	100	100(0)	-	100(0)	100(0)	-	-	-
Exhaust Rocker Arm Assembly	02-390B	B	-	100	100(0)	-	100(0)	100(0)	-	-	-
Intake and Exhaust Pushrods	02-390C	B	-	100	100	-	-	-	-	-	-
Connector Pushrod	02-390D	B	-	100	100	-	-	-	-	-	-
Rocker Arm Bushings	02-390E	B	-	100	-	-	-	-	-	-	-
Rocker Arm Bolting	02-390G	B	-	100	100	-	100(0)	100(0)	-	-	-
Overspeed Trip Governor	02-410A	A	-	-	-	-	-	-	X(0)	-	9
Overspeed Trip & Accessory Drive	02-410B	A	-	100(0)	100(0)	-	100(0)	100(0)	-	-	-
Overspeed Trip Couplings	02-410C	A	-	100	-	-	-	-	-	-	-
Overspeed Trip Vent Valves	02-410D	A	-	-	-	-	-	-	X(0)	-	9
Speed Regulating Governor Drive	02-411A	A	-	100(0)	100(0)	-	100(0)	100(0)	-	-	-
Governor Drive Couplings	02-411B	A	-	100	-	-	100	-	-	-	-
Governor Linkage	02-413	A	-	100	-	-	-	-	-	-	-
Fuel Pump Linkage-Auto Shutdown Cylinder	02-413B	B	-	100	-	-	-	-	-	-	-
Speed Regulating Governor	02-415A	A	-	-	-	-	-	-	X(0)	-	9
Governor Booster Servomotor	02-415B	B	-	-	-	-	-	-	X	-	9
Governor Heat Exchanger Assembly	02-415C	A	-	-	-	-	-	-	X(0)	-	9
Lube Oil Pump	02-420	A	-	-	-	-	-	-	X(0)	-	9
Jacket Water Pump	02-425A	A	-	100(0)	-	-	100(0)	100(0)	X(0)	-	9
Intercooler Piping-Coupling, Bolt, Gskt.	02-436B	A	-	100	-	-	-	-	-	-	-
Turbo Cooling Water Pipe and Fittings	02-437A	B	-	100	-	-	-	-	-	-	-
Turbo Cooling Water Pipe Supports	02-437B	A	-	100	-	-	-	-	-	-	-
Start Air Manifold Pipe, Tubing & Fitting.	02-441A	A	-	100	-	-	-	-	-	-	-
Start Air Manifold Vlvs, Strainers, Fltrs.	02-441B	A	-	-	-	-	-	-	X(0)	-	9
Start Air Manifold Pipe Supports	02-441C	A	-	100	-	-	-	-	-	-	-
Starting Air Distributor Assembly	02-442A	A	100(0)	100(0)	-	-	-	100(0)	-	-	6
Start Air Distributor Tbg., Ftg., Gskts.	02-442B	A	-	100	-	-	-	-	-	-	-
Fuel Oil Booster Pump	02-445	A	-	-	-	-	-	-	X(0)	-	9
Fuel Oil Piping and Tubing	02-450B	A	-	100	-	-	-	-	-	-	-
Fuel Oil Piping Supports	02-450D	A	-	100	-	-	-	-	-	-	-
Fuel Oil Filters	02-455A	B	-	-	-	-	-	-	X(0)	-	9
Fuel Oil Strainers	02-455B	B	-	-	-	-	-	-	X(0)	-	9
Fuel Oil Filter Mounting Hardware	02-455C	A	-	100	-	-	-	-	-	-	-
External Lube Oil Lines	02-465A	A	-	100	-	-	-	-	-	-	-
External Lube Oil Line Supports	02-465B	A	-	100	-	-	-	-	-	-	-
External Lube Oil Valves	02-465C	A	-	-	-	-	-	-	X	-	9
Turbocharger Lube Oil Piping	02-467A	B	-	100	-	-	-	-	-	-	-
Turbocharger Lube Oil Piping Supports	02-467B	B	-	100	-	-	-	-	-	-	-
Turbocharger Bracket	02-475A	B	-	100	-	-	-	-	-	-	-
Turbocharger Air Butterfly Valve	02-475B	A	-	100(0)	-	-	100(0)	100(0)	-	-	-
Turbocharger Bracket Bolting	02-475D	B	-	8(0)	-	-	8(0)	-	-	-	12
Control Panel Cabinet	02-500A	A	-	-	-	-	-	-	X	-	9
Control Air Accumulator	02-500F	A	-	-	-	-	-	-	X	-	9
Control Air System Valves	02-500G	A	-	-	-	-	-	-	X	-	9

Table 5-1.

Catawba Unit 1 Diesels Inspection Plan Matrix

Sample Size, Percent of Engine Parts Inspected

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Part Name	Part No.	Class	Dimen.	Visual	Surf. Vol.		Material	Hardness	Eng Ev	Notes
					NDE	NDE				
Control Air System Pressure Switches	02-500H	B	-	-	-	-	-	-	X	9
Control System Relays	02-500J	A	-	-	-	-	-	-	X	9
Control System Solenoid Valves	02-500K	A	-	-	-	-	-	-	X	9
Control Air System Piping, Tubing, Fittings	02-500M	B	-	100	-	-	-	-	-	-
Control Panel Wiring	02-500N	A	-	-	-	-	-	-	X	9
Lube Oil Sump Tank	02-540A	B	-	100	-	-	-	-	-	-
Lube Oil Sump Tank Bolting	02-540B	B	-	100	-	-	-	-	-	-
Lube Oil Sump Tank Mounting Hardware	02-540C	B	-	100	-	-	-	-	-	-
Foundation Bolts and Anchors	02-550	B	-	-	-	-	-	-	X(0)	9
Instrumentation Thermocouples	02-630D	B	-	-	-	-	-	-	X	9
Engine & Auxiliary Module Wiring Conduit	02-688A	A	-	100	-	-	-	-	-	-
Engine and Auxiliary Module Wiring	02-688B	A	-	-	-	-	-	-	X	9
Engine and Auxiliary Module Wiring Boxes	02-688C	A	-	-	-	-	-	-	X	9
Engine Alarm Sensors	02-690	A	-	-	-	-	-	-	X	9
Off Engine Safety Alarm Sensors-Switches	02-691A	B	-	-	-	-	-	-	X	9
Engine Shutdown Tubing and Fittings	02-695A	B	-	100	-	-	-	-	-	-
Engine Shutdown Valves, Regs. & Orifice	02-695B	A	-	-	-	-	-	-	X	9
Engine Shutdown Trip Switches	02-695C	A	-	-	-	-	-	-	X	9
Fuel Oil Duplex Strainer	02-825D	A	-	-	-	-	-	-	X	9
Turbocharger Thrust Bearing Lube System	02-CFR	C	-	100	-	-	-	-	-	-
Thermostatic Valve	C 136-40	B	-	-	-	-	-	-	X	9
Intake Air Filter	CN-106	B	-	-	-	-	-	-	X	9
Intake Air Silencer	CN-107	B	-	-	-	-	-	-	X	9
Before and After Lube Oil Pump	CN-109	A	-	-	-	-	-	-	X	9
Full Flow Lube Oil Filter	CN-110	A	-	-	-	-	-	-	X	9
Lube Oil Heat Exchanger	CN-111	B	-	-	-	-	-	-	X	9
Generator Shaft and Bearings	CN-119A	A	-	-	-	-	-	-	X	9
Jacket Water Heat Exchanger	CN-120	B	-	-	-	-	-	-	X	9
Oil Prelube Filter	CN-122	A	-	-	-	-	-	-	X	9
Lube Oil Keepwarm Strainer	CN-131	A	-	-	-	-	-	-	X	9
Intercooler	F-068	A	-	100	100	-	-	-	-	-
Turbocharger	MP-022/3	A	100	100	-	-	-	-	-	-
Lube Oil Full Pressure Strainer	SE-025	A	-	-	-	-	-	-	X	9

Notes to Table 5-1

1. Intake and exhaust valve springs have proper color code.
2. Ultrasonic wall thickness measurement of fire deck area and fuel nozzle area.
3. A torsigraph will be developed of the crankshaft.
4. Crankshaft web deflections and thrust clearance will be measured with the diesel both hot and cold.
5. Measure torque on belleville spring loaded bolts.
6. Hardness of the spools will be measured only if excessive wear is measured on one or more of the spools.
7. If inspection of camshaft lobes shows no abnormal wear, then no inspections of the camshaft bearings will be performed.
8. Eddy current test to determine if there are cracks.
9. Engineering validation (Eng Ev) of diesel 1A part including visual inspection to determine that part is per bill of materials and review of unscheduled maintenance reports associated with part. For diesel 1B, engineering validation consists of reviewing unscheduled maintenance reports.
10. Piston skirts will be replaced on the 1B diesel. Surface NDE and hardness were performed in receipt inspection.
11. New piston rings will be installed on the new skirts.
12. All bolting will be replaced.
13. Catawba 1B frequency of inspections same as Catawba 1A except as noted by parentheses. Where parentheses are included, frequency of inspection for Catawba 1B appears in the parentheses.