UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

DOCKETED

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD '84 AGO -3 ATT :20

In the Matter of

DUKE POWER COMPANY, et al.

(Catawba Nuclear Station
Units 1 and 2)

Docket No. 50-413
50-414

APPLICANTS RESPONSE TO PALMETTO ALLIANCE AND CAROLINA ENVIRONMENTAL STUDY GROUP INTERROGATORIES FOR WHICH THE BOARD HAS GRANTED INTERVENORS' MOTION TO COMPEL

On July 16, 1984, during the conference call of the Board and Parties, the Board granted the Intervenors' Motion to Compel with respect to seven interrogatories, as modified by the Board, and denied the Motion with respect to the remaining interrogatories. Pursuant to this partial grant of the Motion to Compel, Applicants hereby submit their responses to the compelled interrogatories.

Applicants' Responses to Interrogatories as Modified by the Board

The responses are provided below. The initials of these individuals providing basic information incorporated in the responses appear next to the answers. Intervenors should make advance arrangements with A. V. Carr, Counsel for Duke Power, if they desire to inspect the documents indicated in these responses. The documents will be available for inspection and copying at the Duke Power Company offices located at 422 South Church Street, Charlotte, North Carolina.

8408060035 840801 PDR ADOCK 05000413 G PDR

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15. Produce for inspection and copying all documentation required by Applicants from TDI regarding the Catawba diesel generators, including but not limited to those summarized in Attachment 12-1 to Applicants February 22, 1984 response to the NRC Staff.

The documents requested have been made available for inspection and copying. The documents are listed in Attachment 1.

(JOB, JDH)

16. Identify in detail, and make available for inspection and copying any and all records of Applicants' surveillance performed at TDI with respect to the Catawba diesel generators.

The documents requested have been made available for inspection and copying. The documents are listed in Attachment 2. (JMC)

17. Identify in detail all records in your possession, not previously given to Intervenors, reflecting shop testing or qualification testing with respect to the Catawba diesel generators, including but not limited to the testing identified in attachment 6-2 to the above-referenced submittal. Make available such records for inspection and copying.

The requested records are identified in Attachment 3. These records have been made available for inspection and copying.

(JDH)

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18. Identify in detail, and make available for inspection and copying any records of inspections of the Catawba diesel generators at TDI as well as after receipt at Catawba.

The requested inspection reports are identified in Attachment

4. These reports have been made available for inspection and copying. (HLA, EEB)

19. Identify any components of the Catawba diesel engines in your possession not manufactured by TDI and describe in detail the surveillance and inspection records applicable to each component. Please make available such records for inspection and copying.

Applicants, in their original response, interpreted the question to be directed to major components of the diesel engines. The only major components of the engine which were not manufactured by TDI are the turbochargers and fuel injection pumps. Other components which were not manufactured by TDI are identified in Attachment 5. (JOB)

Direct surveillance at United Technologies/Elliot Corporation was performed by the Duke Power QA Vendors Division on 3/15/84, 3/29/84 and 6/4/84 on repair work on the Duke turbochargers. These surveillance reports are contained in Attachment 2. Subvendor procurement by TDI is regularlyreviewed during surveillance visits and reevaluations of the TDI QA Program. (JMC)

21. What failures or deficiencies have Applicants or the NRC Staff identified in the Catawba engines in procurement, vendor surveillance, or receiving inspection programs? For other DSRV-16 engines?

The failures or deficiencies identified during the period from procurement to receipt inspection are identified in Attachment 6. These deficiencies relate only to the Catawba diesel engines. Applicants are unaware of deficiencies in other DSRV-16 engines, and believe that this question is directed to the NRC Staff. Documents have been made available for inspection and copying. (HLA, JMC, JOB)

35A. Describe in detail the Catawba maintenance and testing program for emergency diesel generators.

Information as to the Catawba maintenance and testing program is included in the Duke submittal to the NRC dated June 29, 1984 entitled "Catawba Nuclear Station Diesel Engine 1A Component Revalidation Inspection". This public document was served on Intervenors. Additional information on the subject is in the letter to Harold R. Denton from Hal B. Tucker, dated July 16, 1984, stating Duke Power Company's plans for the periodic maintenance, inspection, and surveillance of the Catawba 1A

and 1B diesel engines. This letter was served on Intervenors, but not on the Board. Therefore, a copy of this letter is provided as Attachment 7. (RPM)

Respectfully submitted,

Albert V. Carr, Jr.

Duke Power Company

Post Office Box 33189

Charlotte, N. C. 28242

J. Michael McGarry, III Michael D. White Bishop, Liberman, Cook, Purcell & Reynolds 1200 Seventeenth St., N.W. Washington, D. C. 20036

Attorneys for Duke Power Company et al.

August 1 1984

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CERTIFICATE OF SERVICE

I hereby certify that "Applicants Response To Palmetto Alliance And Carolina Environmental Study Group Interrogatories For Which The Board Has Granted Intervenors' Motion To Compel" in the above captioned matter have been served upon the following by deposit in the United States mail this 1st day of August, 1984.

James L. Kelley, Chairman Atomic Safety and Licensing Board Panel U. S. Nuclear Regulatory Commission Washington, D. C. 20555

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albert V. Carl

Original TDI Diesel Engine Documentation

| Shipment No. | Description | Part or Serial No. | 930.1 | Data Repor |
|--------------|---|--|--------|------------------|
| 4 | Master Engine Book for Job #2761, Engine #75017 (Catawba Engine 1B) | | | |
| 10A | Master Engine Book for Job #2762, Engine #75018 (Catawba Engine 1A) | | | |
| 29 | Capscrews & Hexnuts | Various P/N's | X | |
| 32 | Roll Pins | GC-001-182 | Х | |
| 35 | Fuel Oil Pumps | 980018-1 980018-2 980018-3 980018-4 | | X X X X |
| 38 | Misc. Parts | Various P/N's | Х | |
| 39 | Misc. Parts | Various P/N's | х | |
| 41 | Fuel Oil Pumps (See Shipment #35) | 980018-1 980018-2 980018-3 980018-4 | | X X X X |
| 67 | Screws, Nuts, Bolts | Various P/N's | х | |
| 68 | Bearings, Springs, Bolts | Various P/N's | X | |
| 70 | Capscrews, Nuts, Pins | Various P/N's | х | |
| 73 | Gaskets, Springs, Rings | Various P/N's | х | |
| 92A | Cylinder Head Cover Nuts & Washers | 1A-5530 Various P/N's | X X | |
| 117 | Hex Hd. Caps & Nuts for Engine 75017-2761 & 75018-2762 | GB-001-121 GB-034-006 | X X | |
| 122 | Gaskets, Capscrews, Nuts | Various P/N's | х | |
| 131 | Capscrews | GB-001-121 | х | |
| 200 | Ferrule, Back | CE-014-127 | х | |
| 241 | Piston Skirts for 75018-2762 | 03-341-02-AN | х | |

Attachment 1
Response to PA/CESG Interrogatory 15
Page 2

| Shipment No. | Description | Part or Serial No. | 930.1 Data Repor |
|--------------|--|--|------------------|
| 242 | Gasket, Rings, Hex Nuts, Washers | Various P/N's | x |
| 243 | Studs, O-Rings, Pins, Washers | Various P/N's | х |
| 244 | Piston Skirts for Engine 75017-2761 | 03-341-02-AN | х |
| 245 | Dowel, Stud, Washers | Various P/N's | х |
| 246 | Piston Skirts for Engine 75017-2761 | 03-341-02-AN | x |
| 298 | Push Rods | 02-390-06-AB | X |
| 250 | Connector | 02-390-07-AG | X |
| 355 | Turbochargers | A-609063-3 A-809202-3 A-809202-2 A-809201-4 | х |
| | | | |

TDI Replacement Parts Documentation

Part Description

Connecting Rod Bearing Shell Upper & Lower

Piston Skirts

Push Rods, Connector Rods

Subcovers

Connecting Rod Bushings

Cylinder Head Assy.

Exhaust Valves

Piston Ring Sets

Roll Pins

Documentation

1 930, C of C, QA-505D, QA-605A X-Ray test reports, G-1A

930, C of C, QA-505D, QA-605A, G-1A, MT Reports, Heat Treat Reports, PT Reports, Hardness Reports

930, C of C, QA-505D, QA-605A, G-1A(Hold), Heat Treat Reports, Hardness Reports, PT Test (Partial)

930, C of C, QA-505D, QA-605A, PT Tests Reports, G-1A

930, C of C, QA-505D, QA-605A, G-1A

930, C of C, G-1A, MT, UT Reports, Hydrostatic Test Reports

QA-505D, QA-605A, G-1A, Visual Inspection

930, C of C, QA-605A, G-1A

930, C of C, G-1A

Notes:

- 1. Vendor Quality Assurance Certification
- 2. Certificate of Compliance from Vendor
- 3. Duke Augmented Receipt Inspection Requirement
- 4. Duke Vendor Release
- 5. Duke Receipt Inspection Report

Response to PA/CESG Interrogatory 15 Attachment 1 Page 4

CATAWBA NUCLEAR STATION DRAWINGS & DOCUMENTS WHICH APPLY TO THE DIESEL ENGINES

| CNM1301.00-0001 | Diesel Generator Installation Drawing |
|-----------------|---|
| 0002 | D/G Foundation Drawing |
| 0003 | Concrete Foundation Detail With Engine Erection & Installation Note |
| 0004 | Diesel Engine Mounting Detail Drawing |
| 0005 | Consideration For Mounting Diesel Engine |
| 0007 | D/G Jacket Water Schematic |
| 0031 | Engine Schematic |
| 0061 | Governor Wiring Diagram |
| 0071 | Plant Wiring Diagram, Governor |
| 0072 | Outline EGA Control Box |
| 0072 | Outline Governor Servo Booster Motor |
| 0074-1 | |
| | Potentiameter Assembly, Motor Operated |
| -2 | Potentiometer Assembly, Motor Operated |
| 0075 | Governor 0/L EGB35 |
| 0076 | 5 Ohm Resistor Box |
| 0122 | Instructions/Motor Operated Potentiometer |
| 0135 | Anchor Bolts |
| 0160 | Exhaust Intake & Crankcase Piping Schematic |
| 0161-1 | Engine Electric Diagram & Schematic |
| 0161-2 | Engine Electric Diagram & Schematic |
| 0173 | Seismic Qualification Procedure |
| 0175 | Engine Connection Nozzle Loads |
| 0185 | Load Application Schedule - LOCA |
| 0186 | Load Application Schedule - Blackout |
| 0189 | Operation and Maintenance |
| 0212-1 | Assembly & Inspection Procedure |
| 2 | Assembly & Inspection Procedure |
| -3 | Assembly & Inspection Procedure |
| -4 | Assembly & Inspection Procedure |
| -5 | Assembly & Inspection Procedure |
| 0237-1 | D/G Instruction Manual, Volume 1 |
| -2 | D/G Instruction Manual, Volume 2 |
| -3 | D/G Instruction Manual, Volume 3 |
| 0247 | Engine Qualification Test Report |
| 0251 | Platform Support Bracket/S.A. Manifold Interference Mod |
| 0271 | Platform Support Bracket, Engine 1A |
| 0284 | D/G Technical Specification |
| 0285-1 | Seismic Qualification Reports For D/G Units |
| 0285-2 | Seismic Qualification Reprots For D/G Units |
| 0285-3 | Seismic Qualification Reports For D/G Units |
| 0298 | D/G Service Information Memos |
| 0299 | Engine Test Manual |
| 0300 | Engine Test Manual |
| 0301 | Engine Test Manual |
| 0301 | Ligine rest randi |

Response to PA/CESG Interrogatory 15 Attachment 1 Page 5

CATAWBA NUCLEAR STATION DRAWINGS & DOCUMENTS WHICH APPLY TO THE DIESEL ENGINES

| 0302 | Engine Test Manual |
|-----------------|---|
| CNM1301.00-0303 | Seismic Qualification Report On Magnetic Pickup |
| 0306 | Outline Governor Drive Assembly |
| 0307 | D/G Governor Overspeed Trip Assembly |
| 0312 | Assembly Drawing D/G Turbocharger Lube Oil Fittings |
| 0314 | Assembly Drawing D/G Fuel Oil Header |
| 0315 | Assembly Drawing D/G Turbo Water Piping |
| 0316 | Assembly Drawing D/G Water Discharge Manifold |
| 0319 | Assembly Drawing D/G Internal Lube Oil Lines |
| 0322 | Assembly Ddrawing D/G Exhaust Manifold |
| 0323 | Assembly Drawing D/G Water Inlet |
| 0324 | Assembly Drawing D/G Cylinder Block & Liners |
| 0326 | D/G Engine Pneumatic Schematic |
| 0332 | Outline TWO PC Piston Stud For D/G |
| 0333 | Outline Piston Assembly For D/G |

DUKE POWER COMPANY QA ACTIVITY Transamerican Delaval Oakland, California

| Date of Activity | Type Activity | Activity Accomplished |
|------------------|---------------|---|
| 6/19-20/84 | Surveillance | Witness MT exams of piston skirts. |
| 5/16-17/84 | Surveillance | Investigate documentation for heat treating cylinder skirts. |
| 5/7/84 | Surveillance | Perform surveillance on parts prior to shipment. |
| 3/29/84 | Surveillance | Delaval and Elliott on turbochargers. |
| 3/15/84 | Surveillance | Verify QA Program - Elliott turbochargers. |
| 2/10/84 | Surveillance | Review documentation and details on push rods. |
| 2/9/84 | Surveillance | Review fastener order. |
| 2/9/84 | Surveillance | Review parts - turbo- charger. |
| 2/7-10/84 | Surveillance | Reworking of piston skirts. |
| 11/21-22/83 | Audit | N45.2 - 11 Criteria |
| 11/18/83 | Evaluation | Review of the QA Program status in conjunction with ASME Authorization. |
| 5/17/83 | Surveillance | Witnessed magnetic particle examination of returned piston skirts. Reviewed procedures, NDE qualifications. |
| 2/28 & 3/1 '83 | Surveillance | Witnessed rework of returned piston skirts from Catawba consisting of heat treating, nondestructive testing and dimensional verification. |

DUKE POWER COMPANY QA ACTIVITY Transamerican Delaval Oakland, California

| Date of Activity | Type Activity | Activity Accomplished |
|------------------|-----------------------|--|
| 2/7-10/83 | Surveillance | Witnessed rework of eleven returned piston skirts, consisting of heat treating, nondestructive testing & dimensions. |
| 4/21-22/82 | Survey | N45.2, 18 Point Criteria. This survey performed due to the nonconformances written on Delaval piping at the Catawba site. |
| 10/5/81 | Program Eval. | Review of the QA Program status in conjunction with ASME authorization. |
| 6/17/80 | Program Evaluation | Review of the QA Program status in conjunction with ASME authorization. |
| 12/11-17/79 | Surveillance | Witness DEMA test on engine S/N 75019. Witnessed assembling operations of engine S/N 75020, witnessed testing of control panels for S/N 75017 and S/N 75020. Reviewed available documentation. |
| 4/9-12/79 | Surveillance | Witness qualification testing of engine S/N 75018 & generator S/N 175035-200. Reviewed available documentation for engine S/N 75017 & auxiliary equipment. |
| 2/21-3/1 '79 | Surveillance | Witness testing of engine S/N 75017 & assembling of engine S/N 75018. Reviewed process sheets. |

Attachment 2 Response to PA/CESG Interrogatory 16 Page 3

DUKE POWER COMPANY QA ACTIVITY Transamerican Delaval Oakland, California

| Date of Activity | Type Activity | Activity Accomplished |
|------------------|---------------|---|
| 1/29-2/1 '79 | Surveillance | Witness hydrostatic testing of cylinder block. Witness liquid penetrant on main bearing saddle. Witness bluing-in of base prior to assembling bearings and crankshaft. Witness torqueing of bearing caps. Engine S/N 75017 Reviewed process sheets. |
| 10/17-18/78 | Survey | N45 2, 18 Point Criteria |
| 1/17/77 | Surveillance | Reviewed documentation for Unit 1 & 2 embedment equipment. |
| 9/21-23/76 | Survey | N45.2. 18 Point Criteria |
| 6/10-11/76 | Surveillance | Reviewed documentation ie; manuals and procedures. |
| 9/30&10/1 '74 | Survey | N45.2, 38 Point Criteria |
| 2/17/72 | Survey | Reviewed: Manufacturing Engineering, Quality Control, Records, Testing, Subcon- tractors, Seismic Testing & Reliability Testing. |

Response to PA/CESG Interrogatory 17 Attachment 3 Page 1 of 2

CATAWBA NUCLEAR STATION DRAWINGS & DOCUMENTS WHICH APPLY TO THE DIESEL ENGINES

| CNM1301.00-0001 | Diesel Generator Installation Drawing |
|-----------------|---|
| 0002 | D/G Foundation Drawing |
| 0003 | Concrete Foundation Detail With Engine Erection & |
| 0003 | |
| 0004 | Installation Note |
| 0004 | Diesel Engine Mounting Detail Drawing |
| 0005 | Consideration For Mounting Diesel Engine |
| 0007 | D/G Jacket Water Schematic |
| 0031 | Engine Schematic |
| 0061 | Governor Wiring Diagram |
| 0071 | Plant Wiring Diagram, Governor |
| 0072 | Outline EGA Control Box |
| 0073 | Outline Governor Servo Booster Motor |
| 0074-1 | Potentiometer Assembly, Motor Operated |
| -2 | Potentiometer Assembly, Motor Operated |
| 0075 | |
| | Governor O/L EGB35 |
| 0076 | 5 Ohm Resistor Box |
| 0122 | Instructions/Motor Operated Potentiometer |
| 0135 | Anchor Bolts |
| 0160 | Exhaust Intake & Crankcase Piping Schematic |
| 0161-1 | Engine Electric Diagram & Schematic |
| 0161-2 | Engine Electric Diagram & Schematic |
| 0173 | Seismic Qualification Procedure |
| 0175 | Engine Connection Nozzle Loads |
| 0185 | Load Application Schedule - LOCA |
| 0186 | Load Application Schedule - Blackout |
| 0189 | Operation and Maintenance |
| | operation and resistance |
| 0212-1 | Assembly & Inspection Procedure |
| -2 | Assembly & Inspection Procedure |
| -3 | |
| | Assembly & Inspection Procedure |
| -4 | Assembly & Inspection Procedure |
| -5 | Assembly & Inspection Procedure |
| 0237-1 | D/G Instruction Manual, Volume 1 |
| -2 | D/G Instruction Manual, Volume 2 |
| -3 | D/G Instruction Manual, Volume 3 |
| 0247 | Engine Qualification Test Report |
| 0251 | Platform Support Bracket/S.A. Manifold Interference Mod |
| 0271 | Platform Support Bracket, Engine 1A |
| 0284 | D/G Technical Specification |
| 0285-1 | Seismic Qualification Reports For D/G Units |
| 0285-2 | Seismic Qualification Reprots For D/G Units |
| 0285-3 | Seismic Qualification Reports For D/G Units |
| 0298 | D/G Service Information Memos |
| 0299 | Engine Test Manual |
| 0300 | Engine Test Manual |
| | |
| 0301 | Engine Test Manual |
| 0302 | Engine Test Manual |
| | |

Response to PA/CESG Interrogatory 17 Attachment 3 Page 2 of 2

CATAWBA NUCLEAR STATION DRAWINGS & DOCUMENTS WHICH APPLY TO THE DIESEL ENGINES

| CNM1301.00-0303 | Seismic Qualification Report On Magnetic Pickup |
|-----------------|---|
| 0306 | Outline Governor Drive Assembly |
| 0307 | D/G Governor Overspeed Trip Assembly |
| 0312 | Assembly Drawing D/G Turbocharger Lube Oil Fittings |
| 0314 | Assembly Drawing D/G Fuel Oil Header |
| 0315 | Assembly Drawing D/G Turbo Water Piping |
| 0316 | Assembly Drawing D/G Water Discharge Manifold |
| 0319 | Assembly Drawing D/G Internal Lube Oil Lines |
| 0322 | Assembly Ddrawing D/G Exhaust Manifold |
| 0323 | Assembly Drawing D/G Water Inlet |
| 0324 | Assembly Drawing D/G Cylinder Block & Liners |
| 0326 | D/G Engine Pneumatic Schematic |
| 0332 | Outline TWO PC Piston Stud For D/G |
| 0333 | Outline Piston Assembly For D/G |
| | |

P-1A

TDI Diesel Figine 1A Inspection Records (After receipt at Catawba)

Description of various forms included:

| Description of various forms included: | | |
|--|--|--|
| Form | Description of Form | |
| P-1A | Receiving Inspection Report | |
| 930.1C | DPCo QA Dept. Supplier QA Cert. | |
| CP-350 | Diesel Generator Doweling Record | |
| L-71H | Equipment Lubrication Record | |
| M-5A(&attachments) | Structural Grouting Inspection | |
| M-9D(&attachments) | Process Control Sheet for Installation of Rotating and Non-Rotating Equipment | |
| M-10A | Process Control & Inspection of Torque (or tension) to Bolts and Studs | |
| M-9B | Equipment Release Document for the Installation of Rotating and Non-Rotating Equipment | |
| M-22A | Equipment Disassembly and Reassembly Process Control | |
| M-4A | Weld Process Control Sheet | |
| F-10A(&attachments) | Alteration/Repair Process Control | |
| Q-1A(&attachments) | Non-Conforming Item Report | |
| Work Request 785 (&attachments) | Nuclear Station Work Requests | |
| F-14A | Release For On-site Vendor Work | |
| Q-1D | Reportability Evaluation Request | |
| Miscellaneous Instrument C | alibration Records | |
| M-4J | Temporary Weld Check-off List | |
| R-2A | Inspection Discrepancies | |
| Complete Listing of Inspec | tion Records: | |
| 930.1C | Engine S/N 75018 | |
| CP-350 | Engine Doweling Record S/N 2762-75018 | |
| L-71H | Diesel Engine 1A-Governor | |
| M-5A, CP-377 | Carter-Waters Corporation Grouting Records | |
| M-9D | Diesel Engine 1A | |
| M-10A | Joint EPQ-1609-011-AB Rev.0 | |
| M-10A | Joint EPQ-1609-011-FWB Rev. 0 | |
| M-9B | ID Number 2762-75018 | |
| M-9n(7 shts./4 attachs.) | ID Number 2762-75018 | |
| Miscellaneous Instrument C | alibration Records (18 pages) | |
| M-10A | Joint EPQ-1609-011-VG5 Rev. 0 | |

Engine S/N 2762 70518

| Form | Description of Form |
|-----------------|---------------------------------|
| M-10A | Joint EPO-1609-011-VG6 Rev. 0 |
| M-10A | Joint EPO-1609-011-VG7 Rev. 0 |
| M-10A | Joint EPO-1609-011-VG8 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG9 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG10 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG11 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG12 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG13 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG14 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG16 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG17 Rev. 0 |
| M-10A | Joint EPQ-1609-011-VG18 Rev. 0 |
| M-10A | Joint EPQ-1609-001-VG104 Rev. 0 |
| M-10A | Joint EPQ-1609-001-VG105 Rev. 0 |
| M-10A | Joint EPQ-1609-001-VG107 Rev. 0 |
| M-10A | Joint EPQ-1609-001-VG106 Rev. 0 |
| M-22A | CN: 1609-001, SN: 3 sheet 1. |
| M-9A | Sheet 1 of 1, Rev. 0, EPQ-FD-1A |
| M-10A | Joint EPQ-1609-001-FD1 Rev. 0 |
| M-10A | Joint EPQ-1609-001-FD2 Rev. 0 |
| M-4A | Weld No. FDRR1A1-1 |
| M-4A | Weld No. FDRR1A1-2 |
| F-10A | Serial No. 741 |
| M-4A | Weld No. FDRR1A1-3 |
| M-4A | Weld No. FDRR1A1-4 |
| M-4A | Weld No. FDRR1A1-5 |
| F-10A | Serial No. 742 |
| M-4A | Weld No. FDRR1A2-1 |
| M-4A | Weld No. FDRR1A2-2 |
| M-4A | Weld No. FDRR1A2-3 |
| M-4A | Weld No. FDRR1A2-4 |
| M-4A | Weld No. FDRR1A2-5 |
| F-10A (2 Pages) | Serial No. 505 |
| M-4J | Unit No. 1A |
| R-2A | Serial No. PC-4877 |
| F-10A (2 Pages) | Serial No. 485 |
| M-4J | Unit No. 1 |

| Form | Description of Form |
|---------|---------------------------------|
| M-22A | CN: 1609-0011, SN: 3 Sheet 1 |
| M-10A | Joint EPQ-1609-001-KD1 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD1 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD1 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD2 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD2 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD3 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD3 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD4 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD4 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD5 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD5 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD5 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD6 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD6 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD6 Rev. 1 |
| M-10A | Joint EPQ-1609-001-KD7 Rev. 0 |
| M-10A | Joint EPQ-1609-001-KD8 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD9 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD10 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD11 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD12 Rev. 0 |
| M-10A | Joint VNIAIMA-1 Rev. 0 |
| M-10A | Joint VN1AIMA-2 Rev. 0 |
| M-10A | Joint VN1AIMA-3 Rev. 0 |
| M-22A | CN-1609-001, F-13A #2484 Rev. 0 |
| ' M-10A | Joint EPQ-1609-001-EQA Rev. 0 |
| M-10A | Joint EPQ-1609-011-AIA Rev. 0 |
| M-9D | Serial No. 75018-2762 Rev. 0 |
| Q-1A | Serial No. 15497 |
| M-10A | Joint EPQ-1609-001-LD1 Rev. 0 |
| M-22A | CN-2609-001 Rev. 0 |
| M-10A | Joint EPQ-1609-011-LOPB Rev. 0 |
| M-10A | Joint EPQ-1609-011-LCB Rev. 0 |
| M-22A | Serial No. 75018 Rev. 0 |
| M-22A | Serial No. 75018-2762 Rev. 0 |
| | |

Work Request 785 & Work Request 785 Supplemental (420 pages)

Attachment 4
Response to PS/CESG Interrogatory 18
Page 4

| Form | Description of Form |
|-------|--------------------------------|
| M-22A | 609-00 (2 pages) Rev. 0 |
| Q-1A | Serial No. 16035 |
| F-14A | Work Scheduled Jan. 24, 1983 |
| M-10A | Joint EPQ-1609-011-VG15 Rev. 0 |

TDI Diesel Engine 1B Inspection Records (After Receipt at Catawba)

Description of various forms included:

| Form | Description of Form |
|--|---|
| P-1A | Receiving Inspection Report |
| M-22A | Equipment Disassembly and Reassembly Process |
| M-10A | Control Process Control and Inspection of Torque (& Tension) to Bolts and Studs |
| M-9D | Process Control Sheet for Installation of Rotating and Non-Rotating Equipment |
| M-5A | Structural Grouting Inspection |
| CP-350 | Diesel Generator Doweling Record |
| F-10A | Alteration / Repair Process Control |
| M-4A | Weld Process Control Sheet |
| Q-1A | Non-Conforming Item Report |
| M-4I | Piping Surface Check |
| F-9B | Detailed Process Control Sheet |
| R-2A | Inspection Discrepancies |
| R-3A | Variation Notice |
| F-14A | Release For On-Site Vendor Work |
| Work Request 784 (&attachments) | Nuclear Station Work Request |
| 930.1C | DPCo QA Dept. Supplier QA Cert. |
| Complete Listing of Ir | nspection Records: |
| | |
| P-1A | Engine S/N 2761-75017 |
| P-1A P-1A | Engine S/N 2761-75017 4 pieces "N" Stamp Piping Parts for 75017 |
| | |
| P-1A | 4 pieces "N" Stamp Piping Parts for 75017 |
| P-1A M-22A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J |
| P-1A M-22A M-10A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB |
| P-1A M-22A M-10A M-10A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB |
| P-1A M-22A M-10A M-10A M-10A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB |
| P-1A M-22A M-10A M-10A M-10A M-9D | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) |
| P-1A M-22A M-10A M-10A M-10A M-9D M-9D | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) Revision 0 for 75017-2761 (2 pages) |
| P-1A M-22A M-10A M-10A M-10A M-9D M-9D M-5A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) Revision 0 for 75017-2761 (2 pages) CN-1609-012 (3 pages) |
| P-1A M-22A M-10A M-10A M-10A M-9D M-9D M-5A CP-350 | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) Revision 0 for 75017-2761 (2 pages) CN-1609-012 (3 pages) Serial No. 75017-2761 |
| P-1A M-22A M-10A M-10A M-10A M-9D M-9D M-5A CP-350 M-10A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) Revision 0 for 75017-2761 (2 pages) CN-1609-012 (3 pages) Serial No. 75017-2761 Joint EPQ-1609-002-LD1 Rev. 0 |
| P-1A M-22A M-10A M-10A M-10A M-9D M-9D M-5A CP-350 M-10A M-10A | 4 pieces "N" Stamp Piping Parts for 75017 Serial No. G89A 417J Joint EPQ-1609-012-LCB Joint EPQ-1609-012-AB Joint EPQ-1609-012-FWB Revision 1 for 75017-2761 (14 pages) Revision 0 for 75017-2761 (2 pages) CN-1609-012 (3 pages) Serial No. 75017-2761 Joint EPQ-1609-002-LD1 Rev. 0 Joint EPQ-1609-002-KD9 Rev. 0 |

| Form | Description of Form |
|--------|--------------------------------|
| M-10A | Joint EPQ-1609-002-KD13 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD14 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD15 Rev. 0 |
| M-10A | Joint EPQ-1609-002-KD16 Rev. 0 |
| M-9D | EPQ-FD-1B |
| M-10A | EPQ-1609-002-FD2 Rev. 0 |
| M-10A | EPQ-1609-002-FD1 Rev. 0 |
| F-10A | Serial No. 743 |
| M-4A | Weld FDRR1B1-1 |
| M-4A | Weld FDRR1B1-2 |
| M-4A | Weld FDRR1B1-3 |
| M-4A | Weld FDRR1B1-4 |
| M-4A | Weld FDRR1B1-5 |
| M-4A | Weld FDRR1B1-4A |
| Q-1A | Serial No. 15751 |
| F-9B | Weld No. FDRR1B1-4A |
| M-4A | Weld FDRR1B2-1 |
| M-4A | Weld FDRR1B2-2 |
| M-4A | Weld FDRR1B2-3 |
| M-4A | Weld FDRR1B2-4 |
| M-4A | Weld FDRR1B2-5 |
| M-22A | Rev. 0 for Serial No. 75017 |
| F-10A | Serial No. 744 |
| R-2A | Serial No. W-172 |
| M-10A | Joint EPQ-1609-012-VG1 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG2 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG2 Rev. 1 |
| M-10A | Joint EPQ-1609-012-VG3 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG4 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG4 Rev. 1 |
| M-10A | Joint EPQ-1609-012-VG5 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG6 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG7 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG8 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG9 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG10 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG10 Rev. 1 |
| 930.1C | Engine S/N 75017 |

| Form | Description of Form |
|-----------------------------|---------------------------------------|
| M-10A | Joint EPQ-1609-012-VG13 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG14 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG15 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG16 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG17 Rev. 0 |
| M-10A | Joint EPQ-1609-012-VG18 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG19 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG19 Rev. 1 |
| M-10A | Joint EPQ-1609-002-VG104 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG105 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG106 Rev. 0 |
| M-10A | Joint EPQ-1609-002-VG107 Rev. 0 |
| M-22A | Unit 1-B, System EPQ |
| M-22A | SN2 Sheet 1, CN: 1609-012 |
| M-9D | CN-1609-002 Rev. 0 |
| R-3A | Serial No. 40952 |
| M-10A | Joint VN1BIMB-1 Rev. 1 |
| M-10A | Joint VN1BIMB-2 Rev. 1 |
| M-10A | Joint VN1BIMB-3 Rev. 1 |
| M-22A | CN-1609-002 Rev. 1 |
| M-10A | Joint EPQ-1609-012-AIA Rev. 0 |
| M-10A | Joint EPQ-1609-012-EOA Rev. 0 |
| M-22A | CN: 1609-002 Rev. 0 |
| M-22A | CN: 1609-002 Rev. 0, Ref. F-13A #1698 |
| Q-1A | Serial No. 16035 (21 pages) |
| F-14A | Work Scheduled Jan. 24, 1983 |
| Work Request No. 784 and Su | applements (384 pages) |

Diesel Engine 1A & 1B Turbocharger (& Associated Components) Repair Documentation

Description of various forms included:

| Form | Description of Form | |
|---|--|--|
| P-1A | Receiving Inspection Report | |
| M-22A | Equipment Disassembly & Reassembly Process Control | |
| M-10A | Process Control & Inspection of Torque or Tension to Bolts & Studs | |
| R-3A | Variation Notice | |
| 930.1C | DPCo QA Dept. Supplier QA Certification | |
| Complete Listing of Inspection Records: | | |
| P-1A | Engine 2764-75020 | |
| M-22A | Diesel Engine 75019-2763 | |
| M-10A | Joint EQC-2609-002 KD2 Rev. 0 | |
| M-22A | Process Control, Diesel Engine 2764-75020 | |
| P-1A | Turbochargers S/N A609063-3, A809202-3, A809202-2 & 1 Rotor | |
| M-22A | Diesel Engine 2763-75019 | |
| P-1A | Turbochargers P/N MP-022-000 & MP-023-000 | |
| M-22A | Diesel Engine 2763-75019 | |
| M-10A | Joint EQC-2609-001-KD2 Rev. 0 | |
| R-3A | Serial No. 43087 | |
| P-1A | Diesel Engine 2763 75019 | |
| 930.1C | Diesel Engine 75019-2763 | |

Components in Catawba TDI Engines Not Manufactured by TDI

- Turbochargers manufactured by United Technologies/Elliot Corporation
- Air Intercooler manufactured by Young Radiator
- Intake and Exhaust Valves manufactured by TRW, Inc. or Wells Valve Co.
- Valve Springs manufactured by Betts Spring Co.
- Cylinder Heat Gaskets manufactured by Flexitallic or Bay Seal Co.
- Large Gears manufactured by Bay City Iron Works
- Fuel Pumps and Injectors manufactured by Bendix Scintilla Division, Allied Corporation
- Governor manufactured by Woodward Governor Co.
- Tube Fittings manufactured by Swagelok Division of Crawford Fittings Co.
- Lube Oil Filter manufactured by Commercial Filters Div., Carborundum Corp.
- Fuel Oil Filter manufactured by Air Maze Div., Incom International
- Flexible Pipe Couplings manufactured by Dresser Industries
- Special Fasteners manufactured by Horspool and Romaine
- · Pushrods and Connector Rods manufactured by Weber Machine Co.
- Overspeed Trip Mechanism manufactured by Woodward Governor
- Fuel Oil Booster Pump manufactured by Roper Pump Co.
- Jacket Water Pump (Volute and Impeller Only) manufactured by Pacific Pump Co.
- Lube Oil Pump Cartridge Assembly manufactured by TDI IMO Pump Division

In addition, numerous small items such as seals and fasteners were manufactured by various suppliers. Also, raw components were supplied to TDI for machining and other final manufacturing operations. Some examples of this are:

- Bearing Castings Alcoa Aluminum
- Cam Forgings TDI Texas Forge Division
- Connecting Rod Forgings Kropp Forge Co.
- · Crankshaft Forgings Ellwood City Forge Co.

Attachment 5
Response to PA/CESG Interrogatory 19
Page 2

Direct surveillance at United Technologies/Elliot Corporation was performed by the Duke Power QA Vendors Division on 3/15/84, 3/29/84 and 6/4/84 on repair work on the Duke turbochargers these surveillance reports are contained in the listing. In addition, Duke Power QA Vendors Division has approved the QA Programs of Woodward Governor, Swagelok, Pacific Pump and TDI Imo Pumps Division for other purchases other than those related to the diesel engines.

Subvendor procurement by TDI is regularly reviewed during surveillance visits and reevaluations of the TDI QA Program.

DEFICIENCIES IDENTIFIED DURING PROCUREMENT AND SURVEILLANCE OF TDI DIESEL ENGINES

- 4/21-22/82 ORGANIZATIONAL CHART IN QUALITY ASSURANCE I NUAL INCORRECT.
- 2/8-10/84 TWO NONCONFORMANCES CONSIST OF 54 OBSERVATIONS OF THE ASSEMBLY ROUTE SHEETS. ROUTE SHEETS WERE NOT PROPERLY PREPARED.
- 11/21-22/83 THE INDEX FOR WELDING PROCEDURE SPECIFICATIONS STATED A HIGHER REVISION NUMBER FOR WPS 100-W-1A THAN THE ACTUAL WPS SHOWED IN THE PROCEDURES MANUAL.
- 2/28 & 3/1 '83 DRAWING DID NOT STIPULATE THE PROPER REVISION LEVEL.
- 4/21-22/82 QUALITY ASSURANCE MANUAL DOES NOT SHOW REVISION STATUS.
 - NO DOCUMENTED EVIDENCE THAT ASME CODE ADDENDAS HAVE BEEN REVIEWED FOR IMPACT ON QUALITY ASSURANCE MANUAL.
- 10/17-18/78 NO TIME INTERVAL NOTED FOR THE REISSUE OF INSPECTOR AND WELDER STAMPS AFTER THE STAMP HAS BEEN TURNED IN.
 - MILL TEST REPORT PREPARED BY DELAVAL DOES NOT STATE THE SIZE FOR ELONGATION TESTING (2"-8").
- 9/30 & 10/1 '74 QUALITY CONTROL IS NOT INVOLVED IN THE REVIEW AND APPROVAL FOR DOCUMENT CHANGES.
- 11/21-22/83 APPROVED VENDORS LIST DOES NOT SHOW THE ADDRESS OF SUPPLIERS.

 PURCHASE ORDERS SHOULD STATE APPROVED LOCATION OF SUPPLIERS.
- 4/21-22/82 PURCHASE ORDER 37579 NOT REVIEWED BY QUALITY ASSURANCE PERSONNEL.
- 9/30 & 10/1 '74 NO WRITTEN FORMALIZED PROCEDURES FOR REVIEW OF THE COMPONENT SYSTEM DESIGN AS REQUIRED BY ASME.
 - QUALITY CONTROL IS NOT INCLUDED IN DESIGN REVIEW AND DESIGN CHANGES.
- 11/21-22/83 QUALITY ASSURANCE MANUAL DOES NOT CONTAIN ANY PROVISIONS FOR REPAIR OR REWORK OF CUSTOMER RETURNED MATERIAL.
 - QUALITY ASSURANCE MANUAL DOES NOT CONTAIN ANY PROVISIONS FOR WORK PERFORMED BY DELAVAL AT CUSTOMER NUCLEAR SITES.
- 4/21-22/82 TRAINING RECORDS WERE NOT AVAILABLE FOR THE QUALITY ENGINEERING MANAGER.

Attachment 6
Response to PA/CESG Interrogatory 21
Page 2

- 11/21-22/83 TWO VENDORS ON THE APPROVED VENDORS LIST WERE PAST DUE FOR EVALUATION. BUFFALO FORGE EXPIRED AUGUST 1983 AND CROSBY VALVE EXPIRED SEPTEMBER 1983. FURTHERMORE, THE APPROVED VENDORS LIST WAS REVISED AND ISSUED ON NOVEMBER 18, 1983.
- 4/21-22/82 BETHLEHEM STEEL WAS SURVEYED 5/80, HOWEVER, NO AUDIT HAS BEEN PERFORMED SINCE.

APPROVED VENDORS LIST DOES NOT STATE HOW VENDORS ARE APPROVED.

ASME CERTIFICATION FOR BONNEY PRODUCTS HAVE EXPIRED, HOWEVER, THEY REMAIN ON THE APPROVED VENDORS LIST.

SURVEYS PERFORMED ON ASSOCIATED SPRING AND D M KEMP WERE INADEQUATE.

CALIBRATION SERVICE SUPPLIERS ARE NOT ON THE APPROVED VENDORS

- 4/9-12/79 GENERATOR CONTROL PANEL IN USE FOR TESTING ENGINE 75018 HAS MISSING PARTS.
- 10/17-18/78 VENDOR USED THAT DID NOT APPEAR ON THE APPROVED VENDORS LIST (POWER CONVERSION PRODUCTS). THERE WERE NO RECORDS AS HOW THEY WERE APPROVED.
- 6/10-11/76 DESIGN CONSULTING SERVICES WERE NOT INCLUDED IN THE VENDOR AUDIT PROGRAM.
- 11/21-22/83 NEITHER THE ROUTE SHEET OR DRAWING SPECIFY THE WELDING PROCEDURE REQUIRED FOR WELDING OPERATION ON NUCLEAR SAFETY-RELATED WORK.
- 4/21-22/82 WELDING PROCEDURE 100-W-18A REVISION 2 NOT SIGNED OFF ON WELDING SPECIFICATION SHEET.

NEITHER THE DRAWING OR ROUTE SHEET SPECIFY THE WELDING PROCEDURE REQUIRED FOR NON-CODE FABRICATION.

- 2/8-10/84 TWO NONCONFORMANCES CONSISTED OF 10 OBSERVATIONS CONCERNING SEQUENTIAL SIGN OFFS BY INSPECTORS.
- 2/21 & 3/1 '79 INSPECTION POINTS NOT SIGNED OFF ON TRAVELER.

Attachment 6
Pssponse to PA/CESG Interrogatory 21
Page 3

3/15/84 - Lack of implementation of TDI QA Program at United Technologies/Elliott Corporation.

5/7/84 - Traceability not clear on some parts.

5/16-17/84 - Lack of heat treatment on 1 piston skirt on 1B engine.

6/19-20/84 - Lack of 100% MT testing each piston skirt.

Projects Division NCI's From Receipt Inspection Of Catawba Diesel Engines

| # | Date | Description |
|------|----------|---|
| 664 | 11/16/76 | No documentation received for foundation equipment |
| 665 | 11/16/76 | No documentation received for foundation equipment |
| 666 | 11/16/76 | Rust of foundation bolts and anchors (at receipt) |
| 835 | 01/04/77 | No legible heat number on foundation bolts |
| 836 | 01/04/77 | Heat number of part does not match documentation |
| 887 | 01/20/77 | No documentation received for foundation bolts |
| 5789 | 06/04/79 | One jacket water cooler had loose bolts on capped end |
| 5887 | 06/14/79 | Two jacket water keepwarm pumps did not have national board number |
| 5896 | 06/15/79 | No national board number on two 3-way valve assemblies |
| 7184 | 11/29/79 | No national board numbers on 3 lube oil pumps and 4 fuel oil booster pumps |
| 7338 | 12/20/79 | No national board numbers on 2 waterjacket keepwarm pumps |

Attachment 6
Response to PA/CESG Interrogatory 21
Page 5

Operations Division NCI's on Replacement Parts For Catawba Diesel Engines

| # | Date | Description |
|-----|----------|---|
| 099 | 06/21/84 | MT indication on piston skirt |
| 119 | 07/30/84 | MT indication on link rod bolt |
| 120 | 07/30/84 | X-ray indications on two connecting rod bearing shells |

DUKE FOWER COMPANY P.O. BOX 33189 CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE (704) 373-4531

July 16, 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's plans for the periodic maintenance, inspection and surveillance of the Catawba lA and lB diesel engines. The plan is based on an engineering evaluation of the results of the Catawba lA diesel engine post extended operating test inspections (reference 1), TDI Owner's Group recommendations, and NRC comments regarding diesel engine maintenance, inspection, and surveillance (reference 2). Inspection of the Catawba lB diesel, following its extended operating test has just begun; if shown to be necessary by these inspections, changes will be developed to the maintenance, inspection and surveillance plan contained herein and submitted to the NRC.

A. Planned Program

Planned maintenance, inspection, and surveillance of the Catawba diesels is outlined in the attached Table 1, except that diesel engine periodic testing required by technical specifications is not shown since it is thoroughly described in the Catawba technical specifications (reference 3). It is considered that the maintenance, inspection and surveillance required by Table 1 satisfactorily addresses:

- . The intent of NRC comments in reference 2.
- · Periodic maintenance recommended by TDI in their technical manual.
- Results of inspections of the Catawba lA diesel and other TDI diesels in nuclear service.

B. NRC Comments

The NRC comments of reference 2 relative to items warranting special attention in the periodic maintenance, inspection and surveillance of nuclear plant diesels, and how Duke Power plans to resolve these comments, are discussed below.

B.1 Cylinder Reads

- a. NRC Comment. Following engine shutdown, the engine should be rolled over with air pressure after four hours (during cooldown) with the indicator cocks open. Subsequent to cooldown, engines should be air rolled every 24 hours. Any cylinder heads discovered leaking must be replaced. The utility should confirm that written procedures are adequate to ensure that the cocks are closed following each air roll.
- All cylinder head leaks in Catawba diesels have Discussion. been associated with welded-in repair plugs. Inspections have been performed of the Catawba 1A diesel, and will be performed of the 1B diesel, to identify and replace any cylinder heads with such welded-in repair plugs. Elimination of heads with welded-in repair plugs is expected to minimize the potential for future cylinder head leakage problems. In this regard, it should be noted that no cracks were noted in the Catawba 1A cylinder heads of the type which would be expected to lead to leakage of cooling water into the cylinders (cracks associated with welded-in plugs lead to leaks into the fuel injector cavities, not into the cylinders). The types of cracks which could lead to water leakage into the cylinders include radial cracks in the fire deck emanating from valve seats; this type of crack was not detected in diesel 1A.

Because of the absence of any history of water leakage into Catawba diesel cylinders, it is considered that daily air rolling of the diesels is not warranted. In addition, air rolling involves placing diesels out of service a significant amount of time, approaching an hour per day, which is undesirable. Moreover, if any difficulty should arise with the air roll operation, it is likely to cause the one hour time limit on having a diesel out of operation to be approached; because of technical specification requirements (reference 3), this would require an unnecessary start of the other diesel.

c. <u>Duke Power Planned Action</u>. The engines will be rolled within 4 hours after shutdown and weekly thereafter with indicator cocks open to check for water leakage into the cylinders. Air rolling of the diesels is also performed prior to routine engine starts. The operating procedures covering air rolling require that the cocks be closed after each roll.

B.2 Engine Block and Base

- a. NRC Comment. Inspect the engine block and base every month or 24 hours of operation, whichever comes first. The inspection should be an external visual inspection requiring no disassembly. No other special maintenance is required if any defects found are "non-critical." Non-critical indications are defined as not causing oil or water leakage; not propagating; and not adversely affecting cylinder liners or stud holes.
- b. <u>Duke Power Planned Action</u> Visual inspections of the block and base, as well as numerous other areas will be performed routinely during engine operation, i.e., every month or more often. These inspections will be directed at detecting signs of water or oil leakage at joints and similar areas, and at verifying that dangerous cracks are not propagating from stud holes in the block. The inspections will be performed and documented by operations personnel as part of normal operational checks and will be limited to those inspections which can be performed without disassembly of any parts.

B.3 Connecting Rods

- a. NRC Comment. After each interval of 25 starts, 50 hours of operation or 6 months, whichever occurs first, all connecting rods should be visually inspected and all connecting rod bolts should be retorqued and the results recorded.
- b. Discussion. Inspection of the Catawba 1A diesel connecting rods after over 800 hours of operation and 120 starts showed no signs of degradation and showed that the torques of the 1 1/2" connecting rod bolts had not relaxed. Accordingly, checks of bolt torques after 24 hours of operation or 25 starts appears to be excessively conservative. The NRC suggestion of a time period of 6 months for bolt preload checks appears to have no relation to processes which might cause bolt relaxation and is not warranted. In addition, inspection at 6 month intervals would result in significant loss of diesel availability, which is undesirable, and would require several additional starts of the other engine.

Checks of connecting rod bolt torques by ultrasonic length measurements have recently been completed for diesel 1A, and are considered to be a superior method of checking the preload in these bolts, as compared to use of torque measurements.

It should be noted that, if no significant loss of preload of these bolts occurs, then there is no chance of the joint degrading and no need to visually inspect the bolts. As noted above, relaxation of these bolts has not been experienced at Catawba, nor have the bolts experienced damage. c. <u>Duke Power Planned Action</u>. All the 1 1/2" connecting rod bolt preloads will be checked at the first refueling outage. It is expected that about 25 starts and 50 hours of operation will have been accumulated at that time and that the maximum would be 50 starts and 200 hours of operation.

B.4 Lube Oil Checks

- a. NRC Comment. The lube oil should be checked for water following pre-operational testing and then weekly and after each 24 hours of operation, whichever comes first. It should also be checked on a monthly basis for particulates and chemical contaminants associated with wear of bushings and bearings. Also, at intervals of one month, a sample should be collected from the bottom of the sump to check for water. All filters and strainers should also be checked monthly.
- b. <u>Discussion</u>. The clean lube oil tank and the sump tank are checked for water on a monthly basis. No problems with water accumulation have been noted. Performing this check on a weekly basis is not warranted considering that the diesels are operated on a monthly basis and considering the lack of problems in this area.

A monthly check of lube oil for particulates and chemical contaminants associated with wear of bushings and bearings is not considered warranted since the diesel will accumulate only about I hour of operation per month. Accordingly, this type of check is planned to be performed each 6 months.

c. Duke Power Planned Actions.

- The lube oil will be checked for water following pre-operational testing and then monthly or after 24 hours of operation, whichever comes first.
- A sample will be collected from the bottom of the lube oil sump tank and checked for water each month.
- The lube oil will be checked by ferrographic and spectrographic means every 6 months to check for contaminants and particulates.
- The differential pressures across all filters and strainers will be checked during diesel operation, and filters and strainers will be cleaned or replaced as necessary.

B.5 Cylinder Head Studs, Rocker Arm Cap Screws, Air Start Valve Capscrews

a. NRC Comment. Each month 25% of the capscrews should be spot checked or torqued.

- b. <u>Discussion</u>. Results of the Catawba lA post extended operation test inspection reported in reference 1 showed that no problems with loss of bolt torque occurred in over 800 hours of operation. Subsequent to completion of preoperational tests, only about 1 or 2 hours of operation are expected to be accumulated each month, which is not considered to be significant in regard to causing bolt preload relaxation. In addition, it should be noted that performance of preload checks would involve making the engine inoperable for extensive periods of time while the covers, subcovers and push rods are removed to provide access.
- c. <u>Duke Power Planned Action</u>. Twenty-five percent of the head studs, rocker arm capscrews, and air start valve capscrews will be checked for preload relaxation during each refueling outage. The preloads checks will be performed either by torque measurements or by ultrasonic length measurements.

B.6 Push Rods

- a. NRC Comment. Following pre-operational testing and then subsequently after each 24 hours of operation, cams, tappets, pushrods, etc. should be visually checked. This can be done at a time with the engine shutdown but without affecting its availability for service.
- b. <u>Discussion</u>. Inspection of these parts requires removal of top covers and side covers and this involves having the diesel inoperable for extended periods of time. Accordingly, this inspection should be performed during an outage. Duke Power has friction welded push rods that have seen over 890 hours of operation and 1.2 x 10⁷ cycles with no evidence of cracking.
- c. <u>Duke Power Planned Action</u>. All cams, tappets, push rods, and rocker arms will be visually checked each refueling outage.

B.7 Lube Oil Filter Pressure Drop

- a. NRC Comment. During standby, the lube oil pressure drop should be checked daily.
- b. <u>Discussion</u>. During standby, the diesel lube oil system is in a steady state condition with a low flow rate. Since the diesel is not operating, production and release of particulates is minimal. Accordingly, weekly checks provide fully satisfactory monitoring of filter pressure drop.
- c. <u>Duke Power Planned Action</u>. The prelube oil filter pressure drop will be checked on a weekly basis.

B.8 Crankshaft Deflection Tests

- a. MRC Comment. Perform hot and cold crankshaft deflection checks every 6 months with the hot deflection tests performed within 15 minutes of engine shutdown.
- b. <u>Discussion</u>. Hot and cold deflection tests performed to date up to over 810 hours of operation for diesel 1A have revealed no problems. Performance of these checks every 6 months, i.e. every 6 to 12 hours of operation, is not considered warranted. In addition, it would involve making the diesels inoperable for significant periods of time, which is not desirable.

Performing hot deflection tests within 15 minutes of shutdown is not permissible because of the need to let possibly explosive vapors escape from the crankcase. TDI indicates that hot deflection checks may be performed up to 4 hours after shutdown.

c. <u>Duke Power Planned Action</u>. Hot and cold web deflection tests will be performed at least once each refueling cycle. The hot deflection tests will be performed as expeditiously as possible and within the time period specified by the manufacturer, i.e., within 4 hours of engine shutdown.

B.9 Monitoring of Temperatures, Pressures and Vibrations

- During engine operation, the exhaust NRC Comment. temperature for each cylinder should be monitored continuously by the operator and recorded on a log at hourly intervals, as the temperatures entering and exiting turbocharger. Other temperature and pressure readings for which the engine is instrumented should also be monitored continuously, and recorded hourly, or more frequently if specified by the manufacturer. These should at least include lube oil, jacket water, intercooler temperature, and air pressure. If the engine is equipped with an accelerometer on If the engine is equipped with an accelerometer on the main bearings and turbocharger, these should also be monitored continuously and recorded at hourly intervals. If the engine is not equipped with an accelerometer at these points, main bearing oil temperature should be monitored continuously and recorded hourly. Also, lube oil filter pressure should be monitored daily during engine operation.
- b. <u>Discussion</u>. During diesel operation the following parameters are monitored:
 - Cylinder Exhaust Temp.*
 - · Generator Stator Temp.
 - Turbocharger Inlet Air Temp. (at Intercooler Inlet)*
 - Turbocharger Outlet Air Temp. (at Intercooler Outlet)*

- . Engine Lube Oil Temp.*
- Crankcase Vacuum
- . Lube Oil Filter Delta P
- · Lube Oil Pressure
- e Lube Oil Tank Level
- Fuel Oil Filter Delta P
- Fuel Oil Pressure
- Fuel Oil Tank Level
- Jacket Cooling Water Temp.*
- Jacket Cooling Water Pressure
- Jacket Cooling Tank Level
- · Control Air Pressure
- Lube Oil Pressure at Turbocharger Inlet
- Manifold Air Pressure
- · Starting Air Pressure

The parameters marked with asterisks are continuously recorded as well as monitored.

The following parameters are recorded hourly on operating logs:

- Load Watt Meter
- Power Factor
- Generator Volts
- Generator Amps
- Stator Temp.
- · Lube Oil Pressure
- Lube Oil Filter D/P
- RB Turbo Oil Pressure
- LB Turbo Oil Pressure

- . Fuel Cil Pressure
- Fuel Oil Filter D/P
- Jacket Water Pressure
- . R&L Intake Manifold Pressure
- Lube Tank Level
- · Cylinder Exhaust Temps.

Vibration switches located on the turbocharger are set to trip if excessive vibration levels are encountered. Vibration levels are also measured at various locations on the diesels on a semi-annual basis using hand-held probes.

It is considered that monitoring and recording the above parameters as discussed above provides a fully satisfactory program for monitoring the condition of the diesels.

c. <u>Duke Power Planned Action</u>. Pertinent diesel operating parameters will be monitored and recorded during diesel operation as described above.

C. Significant Features of Planned Program

C.1 Piston Skirt Inspection

The plan in Table 1 includes inspection of all piston skirts after about 10 years of operation to verify the absence of cracking at stud bosses and internal reinforcing rib - wrist pin boss junctions. This inspection would require extensive disassembly, which would not be warranted by the expected number of hours of operation. Accordingly, it is intended to monitor the performance of AE pistons in other TDI diesels during the next 10 years. If the accumulated experience provides confidence, as expected, that AE pistons are not subject to serious cracking concerns, then this inspection may be deleted or changed to a sample basis inspection.

C.2 Bearing Inspections

The plan in Table 1 is based on not disassembling connecting rods or main bearings for inspection until 10 years unless this is indicated to be prudent by ferrographic or spectrographic analyses of lube oil. At that time, a sample of the bearings will be inspected. The bases for this approach are as follows:

- 5,000 hours (connecting rod bearings) to 10,000 hours (main bearings) of diesel operation. It is expected that, in 40 years, the Catawba diesels will accumulate less hours than TDI's recommended inspection periods of 5,000 and 10,000 hours.
- Ferrographic and spectrographic analyses provide a reliable method of ensuring that unusual or excessive bearing wear is not occurring.
- Extensive disassembly of the diesel exposes the engine to factors which can reduce reliability.

D. Summary Observations and Comments

- D.1 The maintenance and inspections recommended by TDI for various time periods are based on the assumption that the diesels will accumulate hours at the rates normal for marine or utility diesels, e.g., 5,000 hours per year. However, in fact, the Catawba diesels are expected to accumulate less than 50 hours per year. Accordingly, the TDI recommendations are excessively conservative for the Catawba diesels. For this reason, TDI's recommended schedule has been relaxed in Table 1 for some items; however, the schedule in Table 1 still calls for much more frequent inspection and maintenance than would be required by the hours of operation.
- D.2 The maintenance, inspection, and surveillance program of Table 1 applies to both the Catawba 1A and the 1B diesels.
- D.3 The TDI Owners Group is preparing a recommended maintenance, inspection, and surveillance program. When it is issued, the Catawba program will be re-evaluated and revised as appropriate.
- D.4 The enhanced inspections requested by the NRC regarding bolt preload checks require extensive amounts of work and appear to be not warranted based on there being no observed loss of preload in the Catawba IA diesel after over 800 hours of operation. Accordingly, if initial preload checks after continued operation continue to show no loss of preload, Duke Power may request relaxation or elimination of these enhanced requirements.
- D.5 The routine periodic maintenance, inspection, and surveillance covered in Table 1 should be considered preliminary and subject to change. As experience is gained with diesel operation, maintenance and test, these requirements may be adjusted. However, any changes to the enhanced requirements discussed in Section B above will be transmitted to the NRC prior to being implemented.

E. References

References used in this letter are listed below:

- Duke Power Company report, Catawba Nuclear Station, Diesel Engine 1A Component Revalidation Inspection, Final Report, June 29, 1984.
- NRC letter dated April 25, 1984, Docket No. 50-416, NRC Evaluation of the TDI Diesel Generator Reliability for Power Operation at Grand Gulf Nuclear Station, Unit 1.
- 3. Catawba Nuclear Station Technical Specifications

We trust that the information provided herein satisfies NRC needs regarding planned maintenance, inspection, and surveillance of the Catawba diesel engines. Please call me if I can be of any further service.

Very truly yours,

Hal. B. Tucker, Vice President

The B. Luction

Nuclear Production

HBT: JG: rum

Enclosures

cc: Mr. James P. O'Reilly, Regional Administrator
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Table 1

Catawba 1A and 1B Diesel Engines

Periodic Inspection, Maintenance and Surveillance Schedule

Planned periodic inspection, maintenance, and surveillance for the Catawba IA and IB diesel engines is described in this table. It should be noted that additional inspection, maintenance, and surveillance will be performed on an as-required basis to correct or investigate actual or potential problems and as required by the plant technical specifications.

The periodic inspection, maintenance, and surveillance program is based on the plant following an 18 month refueling cycle. The anticipated operation of the diesels is as follows:

1 to 2 hours of operation per month of plant operation.

1 start per month of plant operation.

I non prelube start per year.

The planned periodic maintenance, inspection, and surveillance is categorized below by the planned frequency of the work.

SCHEDULE

DURING OPERATION

| PART NO. | PART NAME | REMARKS |
|----------|----------------------------------|---|
| | TOTAL DIESEL AND SUPPORT SYSTEMS | GENERAL VISUAL CHECKS FOR |
| | INCLUDING ENGINE BLOCK & BASE | LEAKAGE AND CHECKS OF COMPONENT PERFORMANCE PARAMETERS |
| 02-500B | CONTROL PANEL ANNUNCIATORS | TEST ANNUNCIATOR LIGHTS VIA TEST |
| 02-5001 | CONTROL PANEL PYROMETERS | CONTINUOUSLY MONITORED, CALI- BRATED AS REQUIRED |
| | STARTING AIR SYSTEM | DRAIN LOW POINTS, STRAINERS AND |
| | LUBE OIL SYSTEM | CHECK LEVELS IN SUMP TANK, GOVERNOR AND PEDESTAL BEARING |
| 02-371A | FUEL OIL PUMP RACK | CHECK FREEDOM OF PUMP BACK |

WEEKLY

| PART NO. | PART NAME | REMARKS |
|----------|------------------|---|
| - | | |
| 02-361 | INDICATING COCKS | CHECK FOR WATER LEAKAGE, AND WITHIN 4 HRS OF SHUTDOWN |
| CN-115 | BATTERY CHARGER | VERIFY BATTERY VOLTAGE |

MONTHLY

| PART NO. | PART NAME | REMARKS |
|----------|--|--|
| CN-119 | GENERATOR | MEGGAR TEST ROTOR AND STATOR |
| - | LUBE OIL SYSTEM | CHECK SYSTEM AND SUMP TANK FOR WATER, PARTICULATES, NEUTRALIZATION, AND SIMILAR CHARACTERIS- |
| | JACKET WATER SYSTEM | TICS CHECK pH |
| CN-110 | FULL FLOW LUBE OIL FILTER SPACE HEATERS | DRAIN WATER & SLUDGE CHECK OPERATION OF SPACE HEATERS IN CABINET |

SEMI-ANNUAL

| PART NO. | PART NAME | REMARKS |
|----------|--|---|
| | | |
| 02-371A | FUEL RACK LINKAGE AND CONTROL SHAFT | LUBRICATE BEARINGS ON CONTROL SHAFT |
| | LUBE OIL SYSTEM | CHECK LUBE OIL BY SPECTROGRAPHIC AND FERROGRAPHIC MEANS |
| - | DIESEL | VIBRATION MONITORING USING MANUAL PROBES |

PACH REFUELING

| PAR | T NO. | PART NAME | REMARKS |
|------|---------|--|---|
| | | IUE OIL JEIS | CHECK FOR PLUGGED OR BROKEN LINES |
| | | CYLINDER3 | MEASURE COLD COMPRESSION & FIRING PRESSURE |
| 0 | 0-700D | JACKET WATER STANDPIPE GADGES | PER STATION CALIBRATION SCHEDULE |
| 0 | 0-700E | JACKET WATER STANDPIPE GAUGES JACKET WATER STANDPIPE SWITCHES | PER STATION CALIERATE TEST SCHEDULE |
| n | 2-31DA | COANECUADO | HETE AND CYNED CHEEK THEOREMONE MEACH DEMENTS |
| 0 | 2-310C | CRANKSHAFT THRUST BEARING RING | MEASURE THRUST BEARING RING CLEARANCE |
| 0 | 2-311A | CRANKCASE ASSEMBLY | REMOVE DOORS AND EXAMINE ENGINE |
| u | Z=31 DE | CYLLINDER HEAD STUDS | CHELK PREJURD OF 252 OF STUDS |
| 0 | 2-340A | CONNECTING RODS AND BUSHINGS | CHECK PRETOAD OF BOLTS |
| 0 | 2-345A | INTAKE TAPPETS | VISUAL & PERFORM MEASUREMENT/ADJUSTMENT |
| 0 | 2-345B | FUEL TAPPETS | VISUAL & PERFORM MEASUREMENT/ADJUSTMENT |
| 0 | 2-350A | FUEL TAPPETS CAMEBAFT ASSEMBLY AIR START VALVE (BOLITING) | VISUAL INSPECTION OF CAM LOBES VERIFY TORQUE OF 25% OF BOLIS |
| 0: | 2-359 | AIR START VALVE (BOLITING) | VERLIFY TORQUE OF 25% OF BOLTS |
| 0 | 2-365B | FUEL INJECTION TIPS | REMOVE, CLEAN, RESET, & REINSTALL |
| 0 | 2-390G | ROCKER ARM BOLTING | VERIFY TOROUE |
| 0 | 2-410A | GOVENOR OVERSPEED TRIP | PERFORMANCE TEST AND RECALLERATE VISUAL INSPECTION WHERE ACCESSABLE W/ELASTOMER REPLACEMENT |
| 0 | 2-411A | GOVENOR DRIVE GEAR AND SHAFT | VISUAL INSPECTION WHERE ACCESSABLE W/ELASTOMER REPLACEMENT |
| 0 | 2-411B | COVENOR DRIVE COUPLING COVENOR LINKAGE | REPLACE ELASTOMER IN COUPLING |
| 0 | 2-413A | GOVENOR LINKAGE | |
| 0: | 2-415A | SPEED RECULATING COVENER | INSPECT FOR LOOSE PARIS ON LINKAGE CHANCE OIL, VERIFY SETTINGS PERFORMANCE TEST, MAINTAIN AS REQUIRED CALIBRATE PER STATION PROCEDURE |
| 0: | 2-475B | TURBOCHARGER AIR BUTTERFLY VALVE | PERFORMANCE TEST, MAINTAIN AS REQUIRED |
| 0 | 2-5700 | CONTROL PANEL PRESSURE CAUCES | CALLERATE PER STATION PROCEDURE |
| 0: | 2-500F | CONTROL AIR ACCUMILATOR | PRESSURE TEST PER STATION CALIBRATION PROCEDURE |
| 0: | 2-500G | CONTROL ATR SYSTEM VALUES | PROPERTIES THAT PER STATION CALIBRATION PROCESSES |
| 0: | 2-500H | CONTROL AIR SYSTEM PRESSURE SWITCHES | CALIBRATE PER STATION PROCEDURE |
| 0: | 2-50W | CONTROL SYSTEM RELAYS | TEST PER STATION SYSTEM PROCEDURE CALLERATE PER STATION SYSTEM PROCEDURES |
| 0 | 2-500K | CONTROL SYSTEM SCLENOID VALVES | CALLERATE PER STATION SYSTEM PROCEDURES |
| 0: | 2-500L | CONTROL PANEL TACHOMETER | CALIBRATE PER STATION PROCEDURE |
| | | LUBE OIL SUMP TANK HEATER | SET THERMOSTATS PER STATION PROCEDURE |
| 02 | 2-6300 | INSTRUMENTATION THERMOCOUPLES | FUNCTIONALLY TEST |
| 02 | 2-689 | INSTRUMENTATION THERMOCOUPLES OFF ENG. SAFETY ALARM SENSORS-WIRING | FUNCTIONALLY TEST |
| 0. | 2-690 | ENGINE ALARM SENSORS | FUNCTIONALLY TEST & CALLERALE |
| 02 | 2-691A | OFF ENG. SAFETY ALARM SENSORS-SWITCHES | FUNCTIONALLY TEST A'D CALIERATE PER STATION PROCEDURE |
| 02 | 2-695B | ENG SHUIDOWN VALVES, REQUIATORS, ORIFICES | SET OR CALLERATE PER STATION SYSTEM PROCEDURE |
| 02 | 2-695C | ENGINE SHUIDOWN TRIP SWITCHES BATTERY CHARGER | TEST PER STATION SYSTEM PROCEDURE |
| 1000 | | | |
| a | -117/8 | GENERATOR CONTROL | TEST AND ALTON SECTIONER PER STATION PROTEDURE |
| | | MISC. EQUIPHEATER, JACKET WATER | |
| G | 119A | CENERATUR SHAFT AND BEARINGS | CHANGE LUBE OIL |

EVERY OTHER REFUELING

PART NO. PART NAME

02-365A FUEL INJECTION PUMP

REMARKS

DISASSEMBLE & CLEAN, INSPECT ONE REPRESENTATIVE PUMP

EVERY FIVE YEARS

PART NO. PART NAME

00-491B TURBO INLET ADPTR-MIG HOWE & FLEX CONN 02-350C CAMEHAFT SUPPORTS, BOLITING AND GEAR 02-355A IDLER GEAR ASSEMBLY (CRANK TO PUMP) 02-355B IDLER GEAR ASSEMBLY 02-410C OVERSPEED TRIP COUPLING

REMARKS

GENERAL VISUAL INSPECTION W/TURBO DISASSEMBLY VISUALLY INSPECT GEAR, MEASURE BACKLASH VISUALLY INSPECT GEAR, MEASURE BACKLASH VISUALLY INSPECT CEAR, MEASURE BACKLASH REPLACE ELASTOMER, INSPECT FOR LOOSENESS ON SHAFT WHILE ASSE CLEAN & POLISH SNAIL & VANES, MEASURE THRUST CLEARANCE

EVERY TEN YEARS

MP22/23 TURBOCHARGER

PART NO. PART NAME

02-305A MAIN BEARING CAP BASE ASSEMBLY

02-3050 MAIN BEARING CAPS

02-305F MAIN BEARING CAP SEALS, GASKETS, & COVER

02-307A LUBE OIL INTERNAL READERS

02-307B LUBE OIL TUBING AND FITTINGS

02-307C LUBE OIL INTERNAL SEALS

02-307D LUBE OIL LINE SUPPORTS

02-310B CRANKSHAFT BEARING SHELLS

02-315A CYLINDER BLOCK

02-315C CYLINDER LINER

02-340B CONNECTING ROD BEARING SHELLS

02-34IA PISTUNS

02-341B PISTON RINGS

02-341C PISTON PIN ASSEMBLY

02-359 AIR START VALVE

02-360A CYLINDER HEAD

02-360B INTAKE AND EXHAUST VALVES

02-3600 VALVE SPRINGS

02-380B EXHAUST MANIFOLD BOLTING

02-390A ROCKER ARM ASSEMBLY

02-390B EXPAINT ROCKER ARM ASSEMBLY

02-390C PUSHRODS

02-3900 CONNECTOR PUSHROD

02-390E ROCKER ARM BUSHING

02-642A STARTING AIR DISTRIBUTOR ASSEMBLY

02-550 FOUNDATION BOLTS AND ANCHORS

CN-111 LUTE OIL HEAT EXCHANGER

CS-120 JACKET WATER HEAT EXCHANGER

F-068 INTERCOCLER

REMARKS

PT OR MT OF TWO SADDLES

CENERAL VISUAL INSPECTION W/ DISASSEMBLY (TWO CAPS)

(EMPRAL VISTAL INSPECTION W/DISASSEMBLY (TWO CAPS)

(PAPRAL VISUAL INSPECTION W/DISASSEMBLY

GINERAL VISUAL INSPECTION W/DISASSEMBLY

CENERAL VISUAL INSPECTION W/DISASSEMBLY

CENTRAL VISUAL INSPECTION W/DISASSEMBLY

VISUAL & RT OF SAMPLE IN CONJUNCTION WITH DISASSEMBLY

PT ACCESSABLE AREAS W/CYL HEAD DISSASSEMBLY

VISUAL INSPECTION IN CONJUNCTION WITH DISASSEMBLY

DIMENSIONAL, VISUAL, & RT OF BEARING SHELLS

VISUAL AND MI INSPECTIONS

REPLACEMENT RINGS INSTALLED DURING REASSEMBLY

VISUAL INSPECTION OF CHROME PLATING

REPOVE, CLEAN & VISUALLY INSPECT W/DISASSEMBLY

PT SELECTED AREAS OF FIRE DECK

VISUALLY INSPECT SEATS & CERCME PLATING

VISUAL INSPECTION W/DISASSEMELY

SX VISUAL INSPECTION W/TURBO DISASSEMBLY

VISUAL INSPECTION OF SOCKETS

VISUAL INSPECTION OF SOCKETS

VISUAL INSPECTION OF WELDS

VISUAL INSPECTION OF WELDS

VISUAL INSPECTION WHERE ACCESSABLE

VISUALLY INSPECT POPPET VALVES SPOOL END & TIMING CAM

VERIFY TORQUE, CHECK FOUNDATION BOND

INSPECT FOR FOULING, ENOSIGN, ETC.

DEPECT FOR FOULING, EROSION, ETC.

VISUAL INSPECTION OF WATER SIDE

AS REQUIRED

| PART NO. PART NAME | REMARKS |
|--|--|
| | |
| 02-387D CRANKCASE VENTILATORS & FLUID MANOMETE | R MONITOR DURING OPERATION AND CALIBRATE AS REQUIRED |
| 02-441B START AIR STRAINERS AND FILTERS | CLEANING/REPLACEMENT COVERNED BY D/P |
| 02-455A FUEL OIL FILTERS | REPLACEMENT COVERNED BY D/P |
| 02-455B FUEL OIL STRAINERS | REPLACEMENT GOVERNED BY D/P |
| 02-540A LUBE OIL SUMP TANK | BASED ON OIL CHANGE REQUIREMENT |
| 02-825D FUEL OIL DUPLEX STRAINER | CLEANING GOVERNED BY D/P |
| 02-835A AIR DRYER | CHANGE DESSICANT |
| CN-106 INTAKE AIR FILTER | REPLACEMENT GOVERNED BY D/P |
| CN-110 FULL FLOW LUBE OIL FILTER | REPLACEMENT COVERNED BY D/P |
| CN-122 OIL PRELUBE FILTER | CHANCE COVERNED BY D/P |
| CN-131 LUBE OIL KEEPWARM STRAINER | CLEANING GOVERNED BY D/P |
| SE-025 LUBE OIL FULL PRESSURE STRAINER | CLEANING GOVERNED BY D/P |

INSPECTION, MAINTENANCE AND SURVEILLANCE PLAN NOTES

- Note 1: Time intervals listed should be understood as meaning the indicated period +/- 50% for time intervals shorter than a refueling interval.
- Note 2: Items requiring 5 and 10 year inspections may be performed at the refueling either before or after the indicated period.

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| In the Matter of | | |
|---|------------|------------------|
| DUKE POWER COMPANY, et al. | Docket No. | 50-413 50-414 |
| (Catawba Nuclear Station) Units 1 and 2) | | 30-414 |

AFFIDAVIT

I, Jesse O. Barbour, being duly sworn, hereby state that I am employed by Duke Power Company as Quality Assurance Manager, Operations. The business address for Duke Power Company is 422 South Church Street, Charlotte, North Carolina.

I have been responsible for furnishing the basic information used in providing responses to those Interrogatories by Palmetto Alliance and Carolina Environmental Study Group concerning the diesel generator contention admitted by the Atomic Safety and Licensing Board by which my initials appear. Those responses are true and correct to the best of my knowledge and belief.

Jesse O Barbour

Subscribed and sworn to before me this / day of august 1984.

Joann D Bowman

My Commission expires: 7-12-88

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| In the Matter of | | |
|---|------------|------------------|
| DUKE POWER COMPANY, et al. | Docket No. | 50-413 50-414 |
| (Catawba Nuclear Station) Units 1 and 2) | | 30 414 |

AFFIDAVIT

I, J. Malcolm Curtis, being duly sworn, hereby state that I am employed by Duke Power Company as Quality Assurance Manager - Vendors. The business address for Duke Power Company is 422 South Church Street, Charlotte, North Carolina.

I have been responsible for furnishing the basic information used in providing responses to those Interrogatories by Palmetto Alliance and Carolina Environmental Study Group concerning the diesel generator contention admitted by the Atomic Safety and Licensing Board by which my initials appear. Those responses are true and correct to the best of my knowledge and belief.

J-Malculm Centro

Subscribed and sworn to before me this 1 day of august 1984.

Po ann D. Bowman

My Commission expires: 7-12-88

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| In the Matter of | |
|---|-----------------------------|
| DUKE POWER COMPANY, et al. | Docket No. 50-413 50-414 |
| (Catawba Nuclear Station) Units 1 and 2) | 50-414 |

AFFIDAVIT

I, J. David Heffner, being duly sworn, hereby state that I am employed by Duke Power Company as Technical Specialist. The business address for Duke Power Company is 422 South Church Street, Charlotte, North Carolina.

I have been responsible for furnishing the basic information used in providing responses to those Interrogatories by Palmetto Alliance and Carolina Environmental Study Group concerning the diesel generator contention admitted by the Atomic Safety and Licensing Board by which my initials appear. Those responses are true and correct to the best of my knowledge and belief.

J David Heffrer

Subscribed and sworn to before me this / day of august 1984.

go ann D. Bowman

My Commission expires: 7-12-88

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| In the Matter of | |
|---|-------------------|
| DUKE POWER COMPANY, et al. | Docket No. 50-413 |
| (Catawba Nuclear Station) Units 1 and 2) | 50-414 |

AFFIDAVIT

I, E. E. Barels, being duly sworn, hereby state that I am employed by Duke Power Company as Assistant Field Engineer, Construction Department. address for Duke Power Company is 422 South Church Street, Charlotte, North Carolina.

I have been responsible for furnishing the basic information used in providing responses to those Interrogatories by Palmetto Alliance and Carolina Environmental Study Group concerning the diesel generator contention admitted by the Atomic Safety and Licensing Board by which my initials appear. Those responses are true and correct to the best of my knowledge and belief.

Edward E. Barels

Subscribed and sworn to before me this 1st day of august

Notary Public Williams

My Commission expires: March 7, 1993

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| In the Matter of | |
|---|-------------------|
| DUKE POWER COMPANY, et al. | Docket No. 50-413 |
| (Catawba Nuclear Station) Units 1 and 2) | 50-414 |

AFFIDAVIT

I, H. L. Atkins, being duly sworn, hereby state that I am employed by Duke Power Company as Quality Assurance Engineer. The business address for Duke Power Company is 422 South Church Street, Charlotte, North Carolina.

I have been responsible for furnishing the basic information used in providing responses to those Interrogatories by Palmetto Alliance and Carolina Environmental Study Group concerning the diesel generator contention admitted by the Atomic Safety and Licensing Board by which my initials appear. Those responses are true and correct to the best of my knowledge and belief.

Subscribed and sworn to before Spesse of Williams
Notary Public

My Commission expires: March 7, 1993