

ORGANIZATION: TRANSAMERICA DELAVAL, INCORPORATED  
ENGINE AND COMPRESSOR DIVISION  
OAKLAND, CALIFORNIA

REPORT NO.: 99900334/83-02	INSPECTION DATE(S): 9/6-15/83	INSPECTION ON-SITE HOURS: 114
CORRESPONDENCE ADDRESS: Transamerica Delaval, Incorporated Engine and Compressor Division ATTN: Mr. C. Matthews, Vice President and General Mgr. 550 85th Avenue Oakland, California 94261		
ORGANIZATIONAL CONTACT: Mr. R. E. Boyer, Manager, Quality Assurance TELEPHONE NUMBER: (415) 577-7422		
PRINCIPAL PRODUCT: Emergency diesel generators.		
NUCLEAR INDUSTRY ACTIVITY: Transamerica Delaval, Incorporated (TDI) has one inprocess contract for domestic nuclear emergency diesel generators.		
ASSIGNED INSPECTOR: <u>I. Barnes</u> for J. W. Sutton, Special Projects Section		1-16-84 Date
OTHER INSPECTOR(S): W. E. Foster, Reactive Inspection Section (RIS) I. Barnes, RIS		
APPROVED BY: <u>I. Barnes</u> I. Barnes, Chief, RIS		1-16-84 Date
INSPECTION BASES AND SCOPE:		
A. <u>BASES</u> : 10 CFR Part 21 and 10 CFR Part 50, Appendix B.		
B. <u>SCOPE</u> : This inspection was made at the request of both NRC Headquarters and Regional Offices as a result of the identification of numerous deficiencies in emergency diesel generators (EDGs) that have been furnished to various sites. Subjects addressed during this inspection included: (1) rocker arm capscrew failure, (2) seismic qualification of (cont. on next page)		
PLANT SITE APPLICABILITY: Rocker arm capscrew failure, missing timing gear bolts, cracked cylinder heads leaking lube oil cooler tubes: 50-322. Jacket water pump shaft failure: 50-322, 50-312, 50-458/459. Seismic qualification of mufflers/silencers: 50-329/330, 50-312, 50-440/441. Piston head rework: 50-206, 50-322, 50-416/417.		

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diesel mufflers/silencers, (3) missing cam gear bolts, (4) leaking lube oil cooler tubes, (5) piston head rework, (6) field service activities, (7) cracked cylinder heads, and (8) jacket water pump shaft failure.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 1:02.2 and 2:06.10 in Perry Specification No. SP-750-454-9-00 and paragraph 1:06.4 in Perry Specification No. SP-706-454-9-00, a QA program was not imposed by TDI on the manufacturer of exhaust silencers for EDGs furnished to Perry, Units 1 and 2.
2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 10.2.6 and 10.3.2 in Section 10 of the Quality Assurance Manual (QAM), inspection stamps and dates on process sheets did not, necessarily, provide evidence of performance of inspection or inspection acceptance as illustrated by the following examples:
  - a. Operation 550 (i.e., dowel cam gear rocker arm hold down bolt installation) in the assembly route sheets (RSs) for Shoreham Nuclear Power Station (SNPS) EDG Serial Nos. 74011, 74012, and 74013 was stamped off as complete by the QC inspector. A subsequent inspection at the SNPS site discovered, however, that the bolts had not been installed.
  - b. A Certificate of Compliance was signed on March 4, 1982, for 23 reworked pistons and shipment made to the San Onofre Nuclear Generating Station, Unit 1, on the following day. Review of inspection dates on RSs for these pistons indicated, however, that QC inspectors accepted the various RS operations in the time period of March 22-26, 1982.
3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 8.1.3 in Section 8 of the QAM and paragraph 4.17.1 in Bechtel Specification 9645-M-018-0, Revision 4:
  - a. Rework was performed on 92 pistons from SNPS and Grand Gulf EDGs without issue and use of RSs.

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- b. Records of activities affecting quality were not maintained with respect to rework operations performed on 66 pistons from Grand Gulf.
4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 2.2, 2.2.3, 2.3, 2.3.2, and 2.4 in Engineering Operating Procedure 6 dated July 21, 1978, jacket water pump analyses dated September 24 and October 4, 1982, and July 15, 1983, for the SNPS had not been certified by the staff Registered Professional Engineer (RPE).
5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 6.4 in Section 6.0 of the Foundry Quality Control Manual and paragraph 10.1 in Quality Control Procedure (QCP) I.P.600-20, the following was noted with respect to replacement cylinder head assemblies for SNPS (Long Island Lighting Company [LILCO] Purchase Order [PO] No. 310552-23):
  - a. Test reports had not been initiated to confirm performance of magnetic particle and ultrasonic examination of castings. Examples by serial and heat number are G83/381J, H-60/519J, H-56/512J, H-66, 67/533J, and H-89/586J.
  - b. Liquid penetrant inspection reports had not been issued in regard to dye check of valve seats of cylinder heads.
6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 9.3.5 and its subparagraphs in Section 9 dated February 27, 1981, of the QAM, certain personnel performing nondestructive examinations of cylinder heads for SNPS on LILCO PO No. 310552-23 had not been certified. This was evidenced by the application of QC Stamp Nos. 3, 8, and 10 (i.e., unqualified personnel) at nondestructive operations on RSs for Part No. 03-360-03-OF. Examples by serial number are G-53, H-11, E-71, H-50, and G-83.
7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 4.4.2 and 4.6.1 in QCP I.P.600, review of certification records for current TDI nondestructive examination personnel revealed that practical examination records did not indicate the use of ten checkpoints by the examiner. It was additionally noted with respect to the 3-year recertification requirement that the Level II radiographer was certified on August 20, 1979, but not recertified until June 2, 1983.

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8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraphs 2.4.1, 8.1.2, and 8.1.3 of QCP I.P.300 dated April 1, 1981, regarding previously identified cylinder heads:
  - a. The inspector had not stamped and dated RSs in the appropriate space for acceptable parts. This was evidenced by: (1) more stamps than dates and (2) limited stamps and dates joined by a line. Examples by serial number are: E-71, H-11, G-50, H-34, and G-4.
  - b. Initials had been used as acceptable evidence of in-process inspection on RSs. Examples by serial number are: G-50, H-11, G-19, E-71, H-89, and H-60.
  - c. A surrendered inspection stamp (QC 30) had been reissued prior to expiration of the minimum 6-month period. Records indicate that the previous holder left the company on September 10, 1982; however, as an example, the RS for Cylinder Head G-50 reflects its usage at Operation No. 170 on November 10, 1982.
9. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 7.5.8.1 in Section 7.0 dated January 25, 1983, of the Foundry QC Manual and paragraph 2.6.1 and its subparagraphs and paragraph 3.1.2 in QCP I.P.100 dated February 12, 1982:
  - a. Welding Machine No. 41 in Weld Area No. 3 (Foundry) had not been calibrated in accordance with the required 12-month frequency as evidenced by its displaying three calibration stickers which exhibited due dates of August 30, 1980.
  - b. Heat Treat Furnace No. 5 had not been calibrated in accordance with the required 6-month frequency as evidenced by the meters and recorders displaying calibration stickers which exhibited due dates of March 13, 1983.
10. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 2.2.3.2 in Section 2 of the QAM, the Manufacturing Manager had not assured adherence to the specified process identified at Operation No. 90 of the RSs for SNPS replacement cylinder head assemblies. The operation (hardfacing of valve seats) required welding in accordance with Specification No. 100-W-17. The NRC inspector was informed that the material reflected in that specification was no longer used and, consequently, a new specification (100-W-17A) was being used.

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11. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 16.2.1 in Section 16 of the QAM dated February 27, 1981, assembly RSs for the cylinder head assemblies furnished for SNPS on LILCO PO. No. 310552-23 had not been retained by Quality Control.

12. Contrary to Criterion V of Appendix B to 10 CFR Part 50, LILCO PO No. 310552-23 dated May 24, 1983, and Revision 1 to Specification No. SH1-89, the Certificate of Compliance dated June 28, 1983, for the cylinder head assemblies furnished for SNPS on LILCO PO No. 310552-23 had not been notarized.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

The findings contained in the report of the previous inspection (99900334/83-01) were not issued prior to the start of the current inspection and, accordingly, will be reviewed during a subsequent inspection.

E. OTHER FINDINGS OR COMMENTS:

1. Failed Rocker Arm Capscrew: A 10 CFR Part 50.55(e) report was made by LILCO on May 4, 1983, to NRC, Region I, which stated that a sudden change in engine sound was noted by the operator during testing of EDG 103. After shutdown of the engine to determine the reason for the condition, it was ascertained by removal of the No. 1 cylinder valve cover that the intermediate intake rocker arm assembly hold down capscrew had failed. Examination by the NRC inspector of documentation pertaining to TDI failure analysis indicated that the failure had been attributed to a fatigue mechanism. Review by TDI on July 18, 1983, with respect to reportability under the provisions of 10 CFR Part 21, concluded that the condition was not reportable in that the failure was considered an isolated case and was the result of improper torqueing. The NRC inspector was informed that this capscrew is torqued in the field as well as at the manufacturing facility. Examination of Appendix IV to the TDI Instruction Manual indicated that a torque value of 365 ft. lb. was specified for the capscrew. It was additionally noted that TDI had issued a Service Information Memo (SIM) on July 26, 1974, which indicated the importance of compliance with specified torque values. Reissuance of this SIM was identified to the NRC inspector as being under consideration.



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The NRC inspector established that the capscrews had been purchased as commercial items and had been installed in all TDI engines. LILCO was stated to have opted for installation of a new type of capscrew in the SNPS engines. After review of the available documentation, the NRC inspector concluded that the failure cause had been identified and that the generic potential could only be assessed by direct verification of applied capscrew torque in supplied engines.

2. Seismic Qualification of Diesel Silencers and Exhaust Systems:

- a. During the Atomic Safety and Licensing Board hearing on July 29, 1983, for the Consumers Power Company Midland Plant, it was identified in testimony that the mufflers/silencers furnished by TDI to Midland and other sites were not seismically qualified.
- b. The NRC inspector reviewed the applicable Bechtel requirements which had been imposed on TDI for silencers and established that the specifications did not include a seismic qualification requirement. TDI was requested to furnish an in line residential type Burgess Manning Model ACA or approved equal silencer with multicompartment construction to limit noise level to NEMAD requirements at 160 feet from the exhaust port. Connecting piping for air and exhaust systems is supplied and installed by site personnel. TDI does provide, however, a seismic report which includes silencers and supports even when not required by customer specification.
- c. The NRC inspector reviewed Perry Specification No. SP-750-4549-00 and associated specifications and identified that exhaust systems had been classified as safety-related and Seismic Category 1. Documentation review at TDI indicated that the required seismic analysis had been performed. One nonconformance (see paragraph B.1) was identified with respect to the failure to impose a QA program on the silencer manufacturer as stipulated by the customer specification. In this phase of the inspection, the NRC inspector reviewed the Gilbert Associates 10 CFR Part 21 report dated July 27, 1983, concerning elevation of engine back pressure. TDI personnel stated that exhaust piping was not designed by TDI and was installed by site personnel. From the available information, it would appear that the installed piping design may have a bearing on the high exhaust pressure. This problem is not considered to have generic aspects in that each nuclear site has different criteria for installation of exhaust piping.

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- d. The NRC inspector additionally reviewed specification requirements and documentation pertaining to seismic evaluation of silencers that had been furnished with EDGs to the River Bend and Rancho Seco facilities. The inspection established that TDI had complied with seismic qualification requirements.
3. Missing Cam Gear Bolts: The NRC inspector reviewed LILCO Deficiency Report No. 654 and the assembly and testing RSs for the SNPS engines. Operation 550 was noted as having been stamped off as complete by the QC inspector for the bolt installation. Subsequent examination at SNPS established, however, that the bolts had not been installed.
- One nonconformance was identified as a result of this deficiency (see paragraph B.2.a).
4. Leaking Lube Oil Cooler Tubes Due to Improper Rolling: Review of available documentation indicated that the lube oil cooler had been purchased from an ASME Certificate Holder and had passed the required hydrostatic test and had been accepted by an authorized nuclear inspector. Examination of SNPS TDI Field Service Reports in regard to this deficiency identified an opinion that the leaking tubes may have resulted from a thermal shock imposed on the cooler during site EDG testing. The absence of site operational records precluded evaluation at TDI whether this opinion was based on actual knowledge that the EDG had been operated in a manner which could result in thermal shock to the lube oil cooler; e.g., operation for a period of time without coolant flow through the cooler resulting in heating of the component and followed by a sudden resumption of coolant flow.
5. Piston Head Rework: The NRC inspector reviewed available documentation pertaining to rework activities that were performed on returned pistons from SNPS, Grand Gulf, and San Onofre as a result of issue of SIM 324, Revision 2. As a result of review of this documentation (i.e., POs, customer specifications, external correspondence, and available RSs), the NRC inspector ascertained that RSs were not prepared for control of rework operations on the 92 pistons received from SNPS and Grand Gulf. It was additionally noted that Becntel Specification No. 9645-M-018-0, Revision 4, required that records of operations, monitoring, etc., be retained for the rework of the Grand Gulf pistons. Review of Stone and Webster Specification No. SH1-89, which is applicable to the SNPS engines, revealed that Certificates of Compliance were required to be notarized. The failures to utilize RSs and retain required records

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in regard to piston rework operations have been identified as a nonconformance (see paragraph B.3). The failure to have the Certificate of Compliance notarized for the SNPS piston rework has been reflected in an additional nonconformance (see paragraph B.12).

Records examination confirmed that RSs had been prepared for control of rework operations on the San Onofre pistons. It was noted, however, that the QC operation acceptance dates on the RSs occurred after issue of the Certificate of Compliance and shipping of the reworked pistons to San Onofre (see paragraph B.2.b).

The above deficiencies are considered indicative of a direct failure of the QA/QC function to both enforce committed quality assurance program provisions with respect to manufacturing process control and to assure appropriate manufacturing compliance with the engineering requirements stipulated for this activity.

6. Field Service Reports and Personnel Qualifications: The NRC inspector reviewed field service reports that had been generated from 1977 to 1983 with respect to the SNPS EDGs. The reports were found to contain adequate information and a description of the corrective action taken to correct a specific problem. A review was additionally made of job descriptions for field service representatives and supervisory personnel to ascertain qualification and experience requirements. It was noted from this review that prior field experience is a requirement for these positions. During the inspection, a discussion was held with TDI management in regard to use of a formalized procedure for reporting to QA/QC of those field identified problems which related to performance of QA/QC activities during manufacturing.
7. Jacket Water Pump Shaft Failure: During a Vendor Program Branch inspection which was conducted July 11-15, 1983, the NRC inspector observed a memorandum addressing jacket water pumps installed on EDGs that had been furnished to LILCO, Gulf States Utilities Company, and a foreign customer. Requested information regarding susceptibility of the jacket water pumps to failure and nonincorporation of the SNPS modification at the River Bend Station (RBS) was not provided. Consequently, this issue remained open. Subsequent to the inspection, it was revealed that EDGs of the same model had also been furnished to the Sacramento Municipal Utility District.



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<p>As a result of the query, an analysis was performed and a memorandum initiated. The memorandum is not in agreement with the failure analysis report (FAR) regarding the cause of the problem. The conclusion of the FAR states, "Failure of the shaft was due to a fatigue crack starting at the small keyway radius. The cause of the keyway radius crack was cyclic movement on an improperly tightened impeller hub nut." The memorandum states, in part, "The cause of the jacket water pump failure at LILCO was attributed to be caused by a high amplitude torsional excitation of the water pump close to the pumps natural frequency." One of the actions to preclude recurrence was to change the impeller material from red brass to ductile iron. According to a memorandum on the redesign analysis of the jacket water pump, "the change to ductile iron . . . increases the shaft-impeller natural frequency away from the pump 4th order resonance . . . ." Another action to preclude recurrence was elimination of the impeller key.</p> <p>The analysis resulted in a "Comparison of R-48 Engine Front End Amplitude of 4th Order at 450 RPM." The comparison accounted for SNPS and RBS but did not account for the units at the Rancho Seco Nuclear Generating Station (RSNGS). The NRC inspector was informed that the data for RBS would also apply to RSNGS inasmuch as the units were essentially the same.</p> <p>It appears that adequate engineering attention has been provided, but a similar level of manufacturing attention does not appear to have been provided. Regarding the jacket water pumps, the NRC inspector has not determined that: (a) different assemblers performed assembly tasks, and (b) inspections have been performed at RSNGS and RBS to ensure that assembly is correct. This will be reviewed during a future inspection.</p> <p>During this area of the inspection, it was determined that the contract required the jacket water pump to be tested and/or analyzed. An engineering operating procedure stated that contractually required analysis and/or test would be reviewed, approved, and certified. The NRC inspector observed that certain calculations associated with the jacket water pump had not been certified; consequently, the nonconformance detailed in paragraph B.4 was identified.</p>		

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8. Cracked Cylinder Heads: LILCO filed a 10 CFR Part 50.55(e) report on April 15, 1983, with the Nuclear Regulatory Commission, Region I. The report addressed "apparent cracking in cylinder heads" in EDGs that had been furnished to SNPS.

The NRC inspector was informed that the only castings that are not produced in the onsite foundry are the housings for the fuel oil, lube oil, fuel injection, and jacket water pumps; also, no aluminum castings. Castings are not categorized as critical or noncritical. It was noted that all cylinder head castings are produced for stock.

The replacement cylinder head assemblies furnished to SNPS on LILCO PO No. 310552-23 were selected for review of process control requirements and implementation of requirements during foundry, machining, and assembling activities. Process controls appear to be adequately documented; however, implementation is less than adequate. Casting certifications attested to the acceptability of magnetic particle and ultrasonic inspections; however, the necessary reports had not been initiated. Additionally, in some instances, the inspection checkoff list (reverse side of the Shipping Copy of the Foundry RS and Production Order) had not been annotated regarding accomplishment of magnetic particle and ultrasonic inspections. The RSs for machining activity exhibited: (a) uncertified/unqualified QC personnel conducting nondestructive examinations, and (b) inspection stamps that had been obliterated by correction fluid and application of a different inspection stamp. In the latter situation, reports of acceptable liquid penetrant inspection had not been issued for the dye checks; consequently, it could not be determined whether the: (a) examinations were performed, or (b) obliterated stamps were simply restamped. Also, there were instances where initials were used where inspection stamps were required. RSs for assembly of the selected hardware had not been retained. Nonconformances identified during this area of the inspection are detailed in paragraphs B.5 through B.11.

In an effort to assess the effectiveness of process controls, the following areas were evaluated: (a) change control, (b) manufacturing process control, and (c) records. This area of the inspection was accomplished by evaluating the following documents for requirements and/or implementation of requirements: 12 drawings, 15 specifications, 8 procedures, 2 quality manuals, 1 PO, 5 memoranda, 1 letter, and numerous other documents identified as: calculations, failure analysis report, casting certification, production RSs, foundry RSs, inspection checkoff sheets, and documents for packaging/shipping. The findings are indicated at other locations of this report.

PERSONS CONTACTED

prany TRAKAMERICA DeLaval INC  
Engine AND Compressor Div.  
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Dates Sept to Apr 6-15-1983

Inspector J. W. Sutton.

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W. Sutton.

Reactor Inspector

USNRC -

WARD DOBREC

FOUNDRY MGR

T. D. I.

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MR. - QUALITY ENGR.

T. D. L.

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DC SUPERVISOR

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D. Beck

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← Attached Exit INTERVIEW -

1	2	TITLE/SUBJECT	3	4
37	8	FDL Customer Service Engineer "B" & "C"		
38	8	4 Supervisor Field Service Dept		
39	8	11 Field Service Representative: Mullen Specialist		
40	8	11 Field Service Representative	3-1-82	
41	5	SO CAL. PO 5610008 - Rework Pistons	11-10-80	
42	8	SIM-324 - Piston Skirt. TDI.	3-4-82	
43	8	CofC. Pistons	3-4-82	
44	8	Supplier Release		
45	8	Salv Order N2 7693	3-1-82	
46	8	Production Routing Sheet - JTB 67824 (23) Pistons	3-7-82	
47	8	Supplier QA Release - SCE - 1		
48	8	Packing List - N2 7693		
49	8	Customer Report. Caplin Reassembly		
50	8	" " Before Reassembly		Rn/21
51	5	P.O. 9645 - F-60002 - Sales order 28618 - Miss Kowalski	11-13-81	
52	2	Test. Specification 9645 - M-018.0 66 Pistons - Shupin	11-23-81	
53	8	DOC Form G 321-C - GG 10 - Grand Grief	11-25-81	
54	8	CofC.	11-23-81	

Columns:  
 1. Sequential Item Number  
 2. Type of Document  
 3. Date of Document  
 4. Revision (if applicable)

Document Types:  
 1. Drawing  
 2. Specification  
 3. Procedure  
 4. QA Manual  
 5. Purchase Order  
 6. Internal Memo  
 7. Letter  
 8. Other (Specify-if necessary)



1	2	TITLE/SUBJECT	3	4
55	6	TRIP report - TPI - Schumacher - Loose Bolts on Pista -	11-21-81	
56	8	Hotel Quality Surveillance Report - (Metal Unit) -	9-23-76	B
57	1	03-341-02 - AE	5-11-82	
58	5	PO 50983 - Horsepool + Romme.	6-18-82	
59	3	COF C.	4-22-81	
60	3	Grid Cnts - Horsepool + Romme	3-11-82	
61	5	PO 49833 - Stud -	11-9-73	Rev 4.
62	2	Beddle Spec - Appendix C - Det 9645 4.17 QA Records.	11-2-81	
63	5	P.O. Beddle River Corp - 9645-F-6002 - Revok	11-25-81.	
64	3	Nuclear Enclavint Shipping Notification 81-782-74034		
65	8	Lilco - Refurb Pactor COFC -	June 24-81	Rev 1
66	1	Spec. S H.I. 89. 65.6		
67	3	PP-300	1-4-82	Rev 1
68	3	C of C - TPI. PO. 310552 - Specification 310552 -	1-5-82	
69	8	TPI. C of C. - Lilco		
70	8	Piston after Assembly - Inspection		
71	3	History before Disassembly.		
72	7	Street Webster - TPI. Series - Det. V 11600. 2.	12-4-81	

Columns:  
 1. Sequential Item Number  
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Document Types:  
 1. Drawing  
 2. Specification  
 3. Procedure  
 4. QA Manual  
 5. Purchase Order  
 6. Internal Memo  
 7. Letter  
 8. Other (Specify-if necessary)

DOCUMENTS EXAMINED

Scope/Module Followup. Regional Requests

1	2	TITLE/SUBJECT	3	4
73	1	TDL- Potomac Crown Studio- S in 324A.	4-16-81	
74	2	SW Spec- Rd. Mark. 2. - 556 d- Rd 1-44-1-30-1-21	5-28-81	
75	3	Stop. TLD. Rpt for Gen. SW. - 1-74.	3-4-81.	
76	7.	TDL- SW. C of C.	5-5-77.	
77	3	C of C- J Gen Sets- 310552-	11-10-80	
78	3	S.M. 324-	8-31-83	
79	6	MEMO- NRC- Aug 31-83- To Potomac from Warner Reg III	8-10-83	
80	6	MEMO NRC. J. Darwin Reg III from R. Cook. S. K. in	6-81.	Rev B4-
81	3	Michand. FSAR- Sheet 35-36	8-9-83	
82	7	Jettin Jordan- Ford - Potential Part 21- Muffler.	7-29-83-	
83	3	Tron Script - Hearing - Page 19535-32.	7-12-83	
84	7	Letter Consumer Power Co- to NRC- Reg. vi III	5-12-83	
85	8.	Rept. 82-22-08. NW Item - Violation NRC-	8-12-83	
86	8	NW Conf Rept C.R. M019-7-158	12-26-83	
87	7.	Sham- Lincoln - Ball - Letter Re. qualification.	6-78	Rev 10
88	3	Amendment #6- Attachment A - PSAR.	8-82	3536
89	3	Michand FSAR- Attachment B- 9.5-29-31		43
90	3	" " " C 3.2-1-3. Table 3.2.1		

Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

1	2	TITLE/SUBJECT	3	4
91	7	TD1 to Bechtel - Rec definition - safety related	8-2-83	
92	6	TD1 - Reference letter above -	3-23-83	
93	7	Bechtel - to TD1. Safety related equipment -	3-14-83	
94	8	TD1 to Bechtel - TD1. Price Repair -	2-24-83	
95	7	TD1 to Bechtel - TD1. Requirements. Immediate Gen.	2-18-83	
96	7	TD1 - Bechtel - Safety related equipment -	2-9-80	Rev S
97	1	TD1 702036 - 020 - CN-E 12-36.	2-22-83	8
98	5	7220-F-390169 -	10-24-89	
99	8	Report - Exhaust Gas Silencer - Final Rep. Prot. Bond.	6-11-82	
100	2	M17-02 - h. Rankin Seco - Smud.	7-81	Rev 11
101	2	SP-562-4549-00 -	3-15-75	Final
102	2	Spec. SP 562-4549-00.	9-7-78	
103	5	TD1 62643 - for Silencer -	10-13-76	
104	5	TD1 62645	10-15-76	
105	2	Per. Mat Spec - 75051 - 12.3. Expansion Joint -	4-27-78	D
106	8	Quality Data - Perry	10-24-76	C
107	8	Bid Request M17-02-01		

## Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

## Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Inspector W. E. FosterScope/Module Followup on Region Requests

DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
1		No. 03-425-09-AF - Shaft, Water Pump	6/29/79	B
2	1	~ 03-425-10-AD - Impeller, 10 1/8" Dia. R.H. C.C.W.	2/10/81	C
3		~ 03-425-09-04 - Pump, Centrifugal - J. U. Eng. Drawn	6/19/83	I
4		~ 03-310-03-0A - Crankshaft, 8 Cyl	6/18/82	H
5		~ 03-310-05-AC - ~	9/1/81	H
6		~ 03-310-05-08 - Crankshaft w/25" Dia x 21" Wide Webs...	9/18/81	A
7		~ 03-310-05-AK - Crankshaft, 8 Cyl	11/12/82	A
8		~ 03-310-05-01 - Crankshaft w/25" Dia x 21" Wide Webs...	3/28/75	AK
9		~ 03-360-03-0F - Cyl Hd, 4 Vlt	2/22/83	J
10		~ 1A-6446 - Head & Valve Assy... Non Nuclear & Nuclear	10/15/82	2
11		~ 1A-6447 - Head Assy...	6/4/80	
12		~ 1A-6379 - ~	10/6/82	
13	2	~ RL 019-000 - Impeller, Mod. 9E - R.H. ...	5/1/81	
14		Engine Spec for Eng 5/24 74039/40 - Mod DSR-28	6/27/82	A
15		~ ~ ~ 81015/116 - ~	1/10/81	
16	2	No. RL 017-000 - Impeller, Mod. B6 JRB L		

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Inspector W. E. Foster

Scope/Module Followup on Region Requests

DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
17		No. 600-30 Add. A - Magnetic Particle Spec.	12/11/81	1
18		~ 1400-2 - Processing of Carbon ... Production Order	2/13/80	0
19		~ 1400-2A -	2/13/80	0
20		~ 120-11-51 - Welding Procedure Spec.	10/26/81	0
21		~ 9010-03-160-03-0F - ... Foundry Practice Procedure	4/15/81	3
22		~ 7 - Low Carbon Manganese Steel	7/2/80	7
23		~ 100-41-N - ... Manual Metallic Arc Welding of ASME Carbon Steel Cyls	9/19/73	1
24		~ 100-1-D - ... Manual Shielded Metal Arc Welding of Mild Steel Castings	6/24/83	3
25		~ 600-3 - ... Normalizing of Carbon and Low Alloy Steel Castings	2/10/81	3
26		~ 600-5 - ... Tempering Steel Cyls	7/15/83	4
27		~ 600-20 - Liquid Penetrant Examination General	10/6/76	3
28		E0176 - Analysis By the Applied Mechanics Group	7/21/78	
29		No. 600-50 - Ultrasonic Examination	11/12/75	0
30		~ 600-20 - Liquid Penetrant Examination	10/6/76	2
31		~ 600-10 - Visual Inspection	9/22/75	1
32		~ 600-30 - Magnetic Particle Particle Examination	10/6/76	1

Columns:

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Document Types:

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5. Purchase Order
6. Internal Memo
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# Scope/Module Followup on Region Requests

DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3
33	3	No. I.P. 600 - Non-Destructive Examination	5/5/81
34	3	Set IV of the Manufacturing Engineering Procedures Manual	1/15/81
35	3	No. I.P. 100 -	2/12/82
36	4	Foundry QC Manual, Sects 2.0; 11.0	5/24/83
37	4	QA Manual, Sects. 5, 9	2/12/82
38	5	LILCO No. 310552-23	7/15/83
39	6	To: Dublin, Fr: W.V. Dilworth - LILCO S.O. #74010/12, I.O. Inspection #14	3/1/83
40		To: G.E. Tammell, Fr: W.L. Pugh - Nuel R-48 Jkt Wtr Pwr	6/4/82
41		To: Staff, Fr: R. Nimm - Memo for Foundry Programs	10/18/82
42		To: Inspector, Fr: K. Knopf - Inspection Stamp Assignments	2/11/82
43	6	To: G.E. Tammell, Fr: D.P. Volf - Jkt Wtr Pwr Redesign Analysis	2/15/83
44	7	To: Stone & Webster Engineering Corp - Shepperton Nuclear Plant...	9/24/82
45	8	Engine Cases - R-48 Front End Amplitude Due to 4th Order	10/4/82
46		~ - Shaft, H <sub>2</sub> O Pwr Flw 03-416-08-AA-R48 LILCO Eng...	9/22/82
47		~ - - - - -	
48	8	Failure Analysis Rpt #146-1A-6786 J.W. Pwr	

## Document Types:

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3. Procedure
4. QA Manual

## 5. Purchase Order

## 6. Internal Memo

## 7. Letter

## 8. Other (Specify-if necessary)

## Columns:

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3. Date of Docu
4. Revision (I

1	2	TITLE/SUBJECT	3	4
1		19 Casting Center for Cyl HD Arays on LILCO P O # 319552-23	Various	
49	8	Inspect Check off Shfts for 8 Cyl HD Sdgs on ~	~	
59		19 Production Rtnng Shfts for Cyl HD Aray above	~	
60		3 Findng Rte Shfts for Cyl HD, P/A 03-360-03-OF	7/8/81	
61		Inventory Cntl Form for Cyl HD Aray P/A 1A-6446	No Date	
62		List of 5 Cyl HD Arays - Machined Thickener North	6/28/81	
63		Anal Pkg/Shipg Notifcation # 88-412 i Supporting documents		
64	8			

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3. Date of Document
4. Revision (If any)

Document Types:

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2. Specification
3. Procedure
4. QA Manual

5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify)

7. Letter \_\_\_\_\_  
8. Other (Specify-if necessary) \_\_\_\_\_