8/29/83

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

'83 AUG 31 A10 :45

Before the Atomic Safety and Licensing Board

In the Matter of	
LONG ISLAND LIGHTING COMPANY	Docket No. 50-322-OL-3 (Emergency Planning)
(Shoreham Nuclear Power Station, Unit 1)	

SUFFOLK COUNTY UPDATE OF OBJECTION
TO SPECIAL PREHEARING CONFERENCE ORDER

In the Suffolk County Objection to Special Prehearing Conference Order (the "Objection"), dated August 23, 1983, the County made certain representations regarding the recent diesel generator problems at the Shoreham plant and the potential impact of those events on the schedule. Late last week the County received updated information from LILCO which affects two of the statements made in the Objection. This pleading is filed to update the Objection with the more current data which the County now possesses.[1/]

First, in footnote 5 of the Objection, the County stated that it had learned that a second diesel crankshaft had indications of a failure. It now has been confirmed that

---

1/ Under the Board's August 24 Order, other parties but not the County are permitted to file pleadings in reply to the County's Objection. The instant County filing is proper since it is not a "reply" but rather brings to the Board's attention altered facts which may affect the Board's consideration of the Objection.

8309010158 830829
PDR ADOCK 05000322
G PDR

D503

all three diesel crankshafts have cracks. See LILCO Status Report on Diesel Generator Crankshaft Matters, Exhibit 1 hereto, at pages 1-2.

Second, on page 7 of the Objection, the County reported from an August 18, 1983 LILCO Press Release that LILCO's most favorable date for Shoreham readiness to load fuel was the first quarter of 1984. LILCO reported on August 25 as follows:

> At the present time, as a result of the crankshaft failures and indications, it is LILCO's current judgment that under the most favorable known circumstances, Shoreham will not be ready to load fuel until sometime late in the first quarter of 1984 or early in the second quarter of 1984.

Exhibit 1 at page 5 (emphasis supplied).

Respectfully submitted,

David J. Gilmartin
Patricia A. Dempsey
Suffolk County Department of Law
Veterans Memorial Highway
Hauppauge, New York 11788

Herbert H. Brown
Lawrence Coe Lanpher
Karla J. Letsche
KIRKPATRICK, LOCKHART, HILL,
CHRISTOPHER & PHILLIPS
1900 M Street, N.W., Suite 800
Washington, D.C. 20036

Attorneys for Suffolk County

August 29, 1983

EXHIBIT 1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322 (OL)
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	
	)	

STATUS REPORT ON DIESEL
GENERATOR CRANKSHAFT MATTERS

LILCO submits this Status Report on Diesel Generator Crankshaft Matters pursuant to the Board's Memorandum and Order Deferring Filing of Testimony and Commencement of Hearings on Diesel Generators dated August 16, 1983.

As LILCO previously reported to the Board promptly on Saturday, August 13, 1983, a failure occurred in the crankshaft of emergency diesel generator 102 in the vicinity of the no. 7 cylinder. Further investigation of the failure indicated that the crankshaft had experienced a crack that severed the shaft. As reported in LILCO's letter to the Board dated August 22, 1983, indications were found on the crankshaft of emergency diesel generator 103. Subsequent investigation confirmed that this crankshaft contained a crack approximately 2" long and

1/2" deep. Examination of the crankshaft of emergency diesel generator 101 has revealed an indication similar to the indication found on the crankshaft of emergency diesel generator 103. The Staff and County were advised of these facts. The indication on the crankshaft of diesel generator 101 has since been determined to be a crack 1 1/2" - 2" long and approximately 360 mils deep. Additional examination of the crankshaft of emergency diesel generator 101 has also revealed indications in the vicinity of the no. 3 and no. 5 cylinder journals. Examination of the crankshafts on diesel generators 101 and 103 is still in progress.

Investigation of the cause or causes of the failure of the crankshaft of emergency diesel generator 102 is underway and will be conducted in accordance with a master plan which generally describes steps to be taken during the investigation and remedy of the crankshaft failure. The master plan also describes organizational responsibilities for this effort. A copy of the master plan, which was approved yesterday, has been made available to the Staff and the County and for the Board's information is attached to this Report. The plan was prepared prior to confirming the existence of cracks on the crankshafts of diesel generators 101 and 103 and therefore does not reflect that information. This Status Report will supplement the

information provided in the master plan with respect to emergency diesel generators 101 and 103.

As the plan indicates, LILCO will use the resources of appropriate LILCO organizations, Stone & Webster Engineering Corp., Transamerica Delaval and appropriate contractors to carry out the steps outlined in the diesel generator master plan. In addition, as the plan also reflects, Failure Analysis Associates (FAA), a highly qualified and experienced organization in the field of failure analyses, will conduct the investigation to determine the cause or causes of the crankshaft failure on diesel generator 102 and the cracks in the crankshafts of diesel generators 101 and 103. FAA, engineering and metallurgical consultants, have substantial experience investigating mechanical, structural and materials failures both in nuclear and non-nuclear applications.

The master plan calls for moving emergency diesel generator 102 from the diesel room to the turbine building where a clean area with controlled access will be established. Transamerica Delaval personnel will then disassemble the engine to permit removal of the failed crankshaft. At present, disconnection of diesel generator 102 from its auxiliary equipment has been completed and preparations for removing the engine from the diesel generator room are underway. Once the engine

has been placed in the turbine building and disassembled, the crankshaft will be sent to an appropriate facility off site for completion of failure analyses by or under the supervision of FAA. A similar process will be used to investigate the cracks on the crankshafts of diesel generators 101 and 103.

LILCO currently intends to replace the existing 13" X 11" crankshafts with 13" X 12" crankshafts on all three engines. Arrangements are now being made for shipment of the crankshafts to the site. The investigation being conducted will also determine whether the installation of these new crankshafts will remedy the problems experienced in the old crankshafts or whether other remedies will be required. LILCO is not certain at this time whether the replacement of the three crankshafts will resolve the problems encountered with the diesel generators or whether some other remedial measures may be required.

Crankshaft replacement is currently planned to take place in the turbine building where the engines will be reassembled. Once reassembly is complete, the engines will be returned to the diesel room where they will be installed and reconnected to auxiliary equipment. As described in the master plan, appropriate testing of the diesels will then be conducted.

As noted, the investigation into the cause or causes of the crankshaft failure in diesel generator 102 and the cracks found in the crankshafts of diesel generators 101 and 103 has commenced and is underway. The cause or causes of these cracks and failures have not been identified. LILCO expects that the crankshaft for emergency diesel generator 102 will be removed from the engine in approximately two weeks and that preliminary information concerning the failure analysis may be available two weeks thereafter. Thus, FAA estimates that a final report on the failure analysis will be completed 4-6 weeks from the date of this Status Report. A copy of this FAA report will be made available to the Board and parties. This estimate of 4-6 weeks will be revised if necessary.

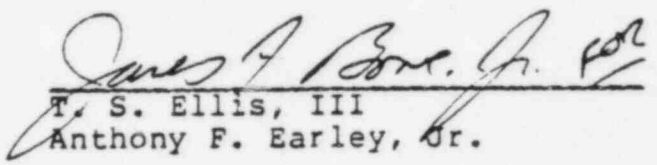
At the present time, as a result of the crankshaft failures and indications, it is LILCO's current judgment that under the most favorable known circumstances, Shoreham will not be ready to load fuel until sometime late in the first quarter of 1984 or early in the second quarter of 1984. More precise estimates of the time it will take to complete the investigation and to repair and test all three diesel generators must necessarily await receipt of further information from the failure analysis. Needless to say, LILCO will continue to take whatever steps are appropriate that would permit an earlier fuel load.

Given this situation, LILCO does not believe it would be productive to conduct any litigation on diesel generator issues until issuance of FAA's failure analysis report. Litigation of diesel generator issues prior to completion of that report would interfere with LILCO's efforts to investigate and remedy the crankshaft matters because key personnel at LILCO, Stone & Webster and Transamerica Delaval would be involved in discovery and testimony at the same time they would be involved in the crankshaft efforts. Accordingly, LILCO respectfully requests that litigation of diesel generator contentions be held in abeyance pending issuance of the FAA final report which is expected in approximately 4-6 weeks. LILCO respectfully suggests that the Board and parties review and consider the matter of scheduling litigation of the diesel generator contentions after the issuance of the FAA final report.

LILCO understands that the Staff supports deferral of any consideration of diesel generator issues. The substance of this status report was provided to the County late Tuesday and we understand that the County also supports deferral.

Respectfully submitted,

LONG ISLAND LIGHTING COMPANY



T. S. Ellis, III
Anthony F. Earley, Jr.

Hunton & Williams
Post Office Box 1535
Richmond, Virginia 23212

DATED: August 25, 1983

1-710.

Shoreham Nuclear Power Station

Emergency Diesel Generator 103

Crankshaft Failure Analysis/Recovery

Master Plan

Approvals:

Project Engineer

Operational Quality Assurance Engineer

Startup Manager

Chairman Design Team Group

Plant Manager

Vice President Nuclear

Dated: August 27, 1985

2 9 10

SHOREHAM NUCLEAR POWER STATION EMERGENCY DIESEL GENERATOR 102 CRANKSHAFT FAILURE ANALYSIS/MASTER PLAN

I. PURPOSE:

The purpose of this master plan is to describe the organization and organizational responsibilities for implementing the investigation into and recovery from the crankshaft failure on the Emergency Diesel Generator 102 at the Shoreham Nuclear Power Station. This master plan includes a description of those activities associated with the failure analysis; the disassembly of the Emergency Diesel Generator to allow for the investigation of the failed components; the review of the implications of this failure on the reliability of the other two diesel generators #101 and #103; and the identification of required retesting to ensure reliable diesel generator operation following repairs.

It must be emphasized that the master plan is necessarily preliminary in nature. Revisions to the approach will be made, if necessary, as information is obtained during the actions set out in this plan.

This master plan has been put in place by the organization described herein, has been reviewed by representatives of LILCO Project Engineering, LILCO Startup, the Shoreham Joint Test Group, Operational Quality Assurance and the Vice-President of Nuclear. In addition, this plan has been developed with the assistance of TransAmerica DeLaval Inc. of Oakland, California and Failure Analysis Associates of Palo Alto, California.

II. ORGANIZATION:

As a result of the failure of the crankshaft on Emergency Diesel Generator 102, an organization has been put in place consisting of the necessary expertise to assess the cause or causes of the crankshaft failure; to recover from that failure and perform suitable retesting following recovery and to determine the implications of this failure on diesel generators 101 and 103. The essential areas of expertise are shown in Attachment No. 1 Organizational Interface Diagram and consist of the following:

a. Startup Personnel
b. Engineering Personnel
c. Scheduling Personnel
d. Vendor Representatives (TDI)

e. Plant Staff Maintenance Support Personnel
f. Failure Analysis Consultants
g. Operational Quality Assurance and TDI QA Personnel

In addition to the organization shown on the attachment, support from the LILCO Office of Nuclear as well as the entire Long Island Lighting Company are available, such as the Purchasing, Engineering, Maintenance Services and Quality Assurance Departments.

A. LILCO Startup

LILCO Startup under the direction of the Startup Manager has the primary line responsibility for implementing and scheduling the entire effort on the three diesel engines since the Emergency Diesel Generators are still under Startup jurisdiction.

Repair Rework Requests initiated by Test Engineers will be the base document for the rework with Maintenance Work Requests (MWR's) being used to support administrative requirements of the maintenance contractor, Catalytic Inc. and other maintenance support organizations. Implementing maintenance and test procedures will be generated by Project Engineering, Startup and TDI and will be provided to the field via the above base documents.

B. MAINTENANCE

Catalytic Inc., a supplemental maintenance contractor to the LILCO Plant Staff maintenance section, will prepare the equipment for removal of diesel generator 102 from the Diesel Generator Room by disconnecting the piping, electrical and other appropriate connections to the engine and generator in accordance with Diesel Generator 102 Disconnection Checklist and implementing work request documents.

Gerosa Inc., a rigging and hauling contractor, will jack and skid the diesel engine out of the room and transport the equipment to the Turbine Building turbine deck, Elevation 63'.

TransAmerica DeLaval Inc. (TDI), the diesel engine manufacturer, will perform the disassembly and rebuilding of the engine. Additionally, the generator will be inspected under the cognizance of its manufacturer (Portec) to determine if it sustained any damage.

TDI representatives will observe all activities associated with this investigation and will provide technical direction. TDI will provide required replacemant parts.

C. LILCO Project Engineering

LILCO Project Engineering (LPO) assisted by the Stone & Webster Site Engineering Office (SEO) will provide engineering support and is responsible for the failure analysis. To accomplish these tasks LPO will use its own resources supplemented by Stone & Webster Engineering Corporation, TDI, Failure Analysis Associates and other consultants as required. Failure Analysis Associates has been charged to take whatever steps are necessary to determine the cause or causes of the failure.

D. Quality Assurance

Operational Quality Assurance will provide the required Quality Assurance coverage in accordance with the LILCO Quality Assurance Program. TDI QA representatives will be present during the period of engine disassembly and reassembly by the TDI work force. The LILCO Quality Assurance Department will provide support to the OQA organization for quality assurance matters.

E. Shift Compliment

During this investigation and the subsequent recovery the on shift compliment will consist of the following:

Startup Test Engineer
Engineering Representative
TDI Representative
Failure Analysis Associates Representative
OQA Representative
Maintenance Support Supervisor

The Test Engineer will be the Shift Director and is responsible for implementing the activities designated to be accomplished during that shift. A pre shift meeting will be held to insure proper coverage is available and to review those activities with the shift compliment.

F. Stop Work Authority

OQA has the authority to "STOP WORK" based on the QA manual.

Persuant to the memoranda from the Startup Manager, Attachment #2 and #3 the on shift FAA representative and TDI representative have been authorized to stop work through the Test Engineer.

G. Review and Audit

The overall work effort will be under the review and audit of the Joint Test Group as described in the Shoreham Startup Manual.

III. DIESEL GENERATOR 102 CRANKSHAFT FAILURE ANALYSIS AND CRANKSHAFT DESIGN ADEQUACY ASSESSMENT

A. Failure Analysis
Conduct an investigation of, and develop a detailed failure analysis for the Diesel Generator 102 crankshaft to determine causes for failure. This effort consists of the following.
1) Attendance, inspection and documentation of Diesel Generator 102 during teardown and reassembly.
2) Appropriate analysis of the failed crankshaft.
3) Review maintenance and operational history.

B. Crankshaft Design
Conduct an inspection and assessment of the adequacy of the existing (13" x 11") and replacement (13" x 12") TransAmerica DeLaval Crank Shafts for Diesel Generators 101, 102 and 103. This effort consists of the following:
1) Review of the TDI design calculations.
2) Performance of independent calculations, as required.
3) Performance of operational torsional vibration tests at various speeds and engine loads on the existing 13" x 11" crankshafts in diesel-generators 101 and 103 and on the replacement 13" x 12" crankshaft for diesel-generator 102.

IV. DIESEL GENERATOR REWORK & INSPECTION

A. Inspections & Tests - Diesel Generator 102
The inspections and tests on diesel generator 102 include but may not be limited to the following:
1.) The connecting rod for cylinder no. 7 will be pulled to allow for inspection/examination for cylinder liner damage.
2.) Main bearings #8, 9, 10 & 11 adjacent to the failure will be pulled to inspect for damage to the bearing, bearing shell and bedplate. This will be performed as soon as possible to allow evaluation of damage.
3.) Analysis of engine oil, jacket water and bearing metal will be performed.
4.) An overall engine inspection during detailed disassembly for crankshaft removal will be performed.

5.) A generator inspection will be performed.
NOTE: Item 1 and 2 above to be accomplished prior to removing the diesel generator from the room.

B. Inspection and Tests - Diesel Generator 101 and 103
The inspections and tests on diesel generator 101 and 103 include but may not be limited to the following:
1.) 100% visual inspection of crankshaft webs and dye penetrant tests where appropriate.
2.) The connecting rods on cylinder 6, 7 & 8 will be pulled to perform 100% LP and UT of the connecting rod journal.
3.) Torsional vibration testing of the crankshaft in the 101 & 103 will be performed following the above inspections per procedure provided by TDI.

C. Diesel Generator 102 Rework
LILCO has overall responsibility for the Diesel Generator 102 rework effort. The Startup Test Engineer on shift will supervise the various aspects of the work described below.

Catalytic personnel will remove pipe, tubing and electrical connections, disconnect the turbocharger; and disconnect the generator in preparation for jacking and skidding the engine out of the room.

Gerosa personnel will rig and jack the engine, skid it out of the room and move it around via flat bed to the turbine building truck bay. The entire engine will be lifted via the turbine building crane and set inside an existing caged-in area on the turbine building deck. A clean room will be set up and access control will be established.

TDI personnel will perform the disassembly allowing the appropriate inspections to take place. The TDI Service Representative will be the responsible supervisor for the TDI workman. The generator will also be inspected for damage while on the turbine deck. LILCO and FAA inspections will be performed during this work.

Once removed, the damaged shaft will be sent off site for failure analysis.

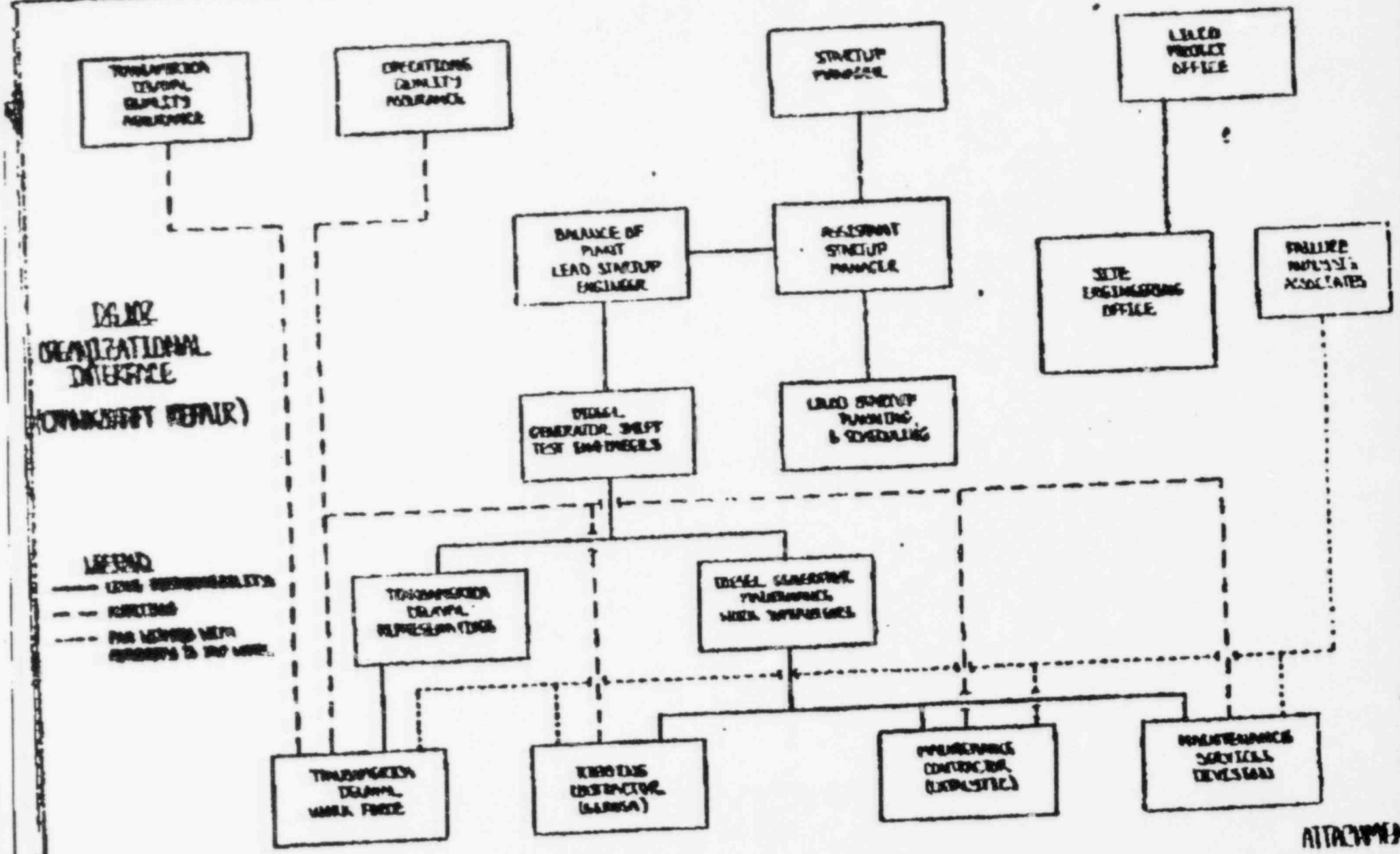
TDI personnel will rebuild the engine under the supervision of a TDI Service Representative and following reassembly, the engine will be transported back into the diesel generator room by Gerosa personnel.

Catalytic personnel will reconnect all apertanances. At this point retesting will begin.

V. RETESTING DIESEL GENERATOR 102

Upon completion of the Emergency Diesel Generator 102 rework and reinstallation, the Preop test program for this engine will be reperformed as follows.

a. All components disturbed by the rework will be subjected to appropriate C&IO, including calibrations, electrical wire checks, and pneumatic tubing connection reverifications.
b. The Lube Oil, Jacket Water, Fuel Oil and Air Start system will be reflushed as required.
c. Initial engine run-in per TDI direction.
d. The Mechanical Preop test will be reperformed in its entirety.
e. The two Electrical Preop tests will be reperformed.
f. Following completion of the above and review and concurrence by the JTG, the Qualification Preop test will be reperformed.


STARTUP MANAGER
LEAD PROJECT OFFICE
BALANCE OF PLANT LEAD STARTUP ENGINEER
ASSISTANT STARTUP MANAGER
SITE ENGINEERING OFFICE
LEAD STARTUP PLANNING & SCHEDULING
LEGEND

ATTACHMENT

ATTACHMENT #2

9 of 10

August 18, 1983

R. T. Purcell
M. Milligan
J. Notaro

STOP WORK AUTHORIZATION - DIESEL ENGINE 102 FAILURE
Shoreham Nuclear Power Station Unit 1
W. O. No. 44430/48923

During the investigation of the Diesel Generator 102 failure the duly authorized Failure Analysis Associate Representative on shift has the authority to stop work as long as the stop work order does not cause a personnel safety concern.

This stop work authorization is being given to ensure that the Failure Analysis Associates people are in a position to ensure that they get the maximum information from the failure investigation.

Upon issuing a stop work order the Failure Analysis Associate Representative shall notify the undersigned of this action immediately.

E. J. Youngling
Startup Manager

EJY:ecm

cc: M. S. Pollock
J. Rivello
W. Museler
W. Steiger
A. Muller
G. Rogers - FAA
J. Kammeyer-SEO

1 of 1 D. LASSITER

ATTACHMENT #3

TO: CAROL PETTIE

August 22, 1983

R. T. Purcell
M. Milligan
J. Notaro

STOP WORK AUTHORIZATION FOR TRANSAMERICA DELAVAL INC.
DIESEL ENGINE 102 FAILURE
Shoreham Nuclear Power Station - Unit 1
W. O. No. 44430/48923

During the investigation of the Diesel Generator 102 failure, the duly authorized Transamerica Delaval Inc. Representative on shift has the authority to stop work, as long as the stop work order does not cause a personnel safety concern.

This stop work authorization is being given to ensure that Delaval personnel are in a position to ensure that they obtain the maximum information from the failure investigation.

Upon issuing a stop work order, the Transamerica Delaval Representative shall notify the undersigned of this action immediately.

E. J. Youngling
Startup Manager

EJY:eom

cc: M. S. Pollock
J. Rivello
W. Museler
W. E. Steiger
A. Muller
G. Rogers - FAA
J. Kammeyer - SEO
L. McHugh - TDI

Rüstl.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322-OL-3 (Emergency Planning)
(Shoreham Nuclear Power Station, Unit 1)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of SUFFOLK COUNTY UPDATE OF OBJECTION TO SPECIAL PREHEARING CONFERENCE ORDER, dated August 29, 1983, were served to the following by U.S. mail, first class, except as otherwise indicated, this 29th day of August 1983.

(*) James A. Laurenson, Chairman
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(*) Dr. Jerry R. Kline
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(*) Mr. Frederick J. Shon
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Edward M. Barrett, Esq.
General Counsel
Long Island Lighting Company
250 Old Country Road
Mineola, New York 11501

Mr. Brian McCaffrey
Long Island Lighting Company
175 East Old Country Road
Hicksville, New York 11801

Ralph Shapiro, Esq.
Cammer and Shapiro
9 East 40th Street
New York, New York 10016

Howard L. Blau, Esq.
217 Newbridge Road
Hicksville, New York 11801

W. Taylor Reveley, III, Esq. (#)
Hunton & Williams
P.O. Box 1535
707 East Main Street
Richmond, Virginia 23212

Mr. Jay Dunkleberger
New York State Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Stephen B. Latham, Esq.
Twomey, Latham & Shea
33 West Second Street
Riverhead, New York 11901

Nora Bredes
Executive Director
Shoreham Opponents Coalition
195 East Main Street
Smithtown, New York 11787

Marc W. Goldsmith
Energy Research Group, Inc.
400-1 Totten Pond Road
Waltham, Massachusetts 02154

MHB Technical Associates
1723 Hamilton Avenue
Suite K
San Jose, California 95125

Joel Blau, Esq.
New York Public Service Comm.
The Governor Nelson A. Rockefeller Building
Empire State Plaza
Albany, New York 12223

David J. Gilmartin, Esq.
Suffolk County Attorney
H. Lee Dennison Building
Veterans Memorial Highway
Hauppauge, New York 11788

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

(*) Bernard M. Bordenick, Esq.
David A. Repka, Esq.
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Stuart Diamond
Environment/Energy Writer
NEWSDAY
Long Island, New York 11747

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Comm.
Washington, D.C. 20555

Hon. Peter Cohalan
Suffolk County Executive
H. Lee Dennison Building
Veterans Memorial Highway
Hauppauge, New York 11788

Eleanor L. Frucci, Esq.
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Comm.
Washington, D.C. 20555

Ezra I. Bialik, Esq.
Assistant Attorney General
Environmental Protection Bur.
New York State Dept. of Law
2 World Trade Center
New York, New York 10047

Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Comm.
Washington, D.C. 20555

Jonathan D. Feinberg, Esq.
Staff Counsel, New York State Public Service Commission
3 Rockefeller Plaza
Albany, New York 12223

Stewart M. Glass, Esq.
Regional Counsel
Federal Emergency Management Agency
26 Federal Plaza, Room 1349
New York, New York 10278

James B. Dougherty, Esq.
3045 Porter Street, N.W.
Washington, D.C. 20008

Spence Perry, Esq.
Associate General Counsel
Federal Emergency Management Agency
Washington, D.C. 20472

Mr. Jeff Smith
Shoreham Nuclear Power Station
P.O. Box 618
North Country Road
Wading River, New York 11792

Lawrence Coe Lanpher

Lawrence Coe Lanpher
KIRKPATRICK, LOCKHART, HILL,
CHRISTOPHER & PHILLIPS
1900 M Street, N.W., Suite 800
Washington, D.C. 20036

DATED: August 29, 1983

(*) By Hand
(#) By Federal Express