

36.

RELATED CORRESPONDENCE

HUNTON & WILLIAMS

2000 PENNSYLVANIA AVENUE, N.W.

P.O. BOX 19230

WASHINGTON, D.C. 20036

TELEPHONE 202-955-1500

707 EAST MAIN STREET P.O. BOX 1535  
RICHMOND, VIRGINIA 23212  
TELEPHONE 804-788-8200  
TWX 710-956-0061

333 SOUTH GRAND AVENUE  
LOS ANGELES, CALIFORNIA 90071  
TELEPHONE 213-617-8200  
TELEX 754709

FIRST VIRGINIA BANK TOWER  
P. O. BOX 3889  
NORFOLK, VIRGINIA 23514  
TELEPHONE 804-625-5501  
TELEX 755628

DOCKETED  
USNRC

299 PARK AVENUE  
NEW YORK, NEW YORK 10171  
TELEPHONE 212-980-8200  
TELEX 754708

B B & T BUILDING P. O. BOX 109  
Raleigh, NORTH CAROLINA 27602  
TELEPHONE 919-828-9371

FIRST TENNESSEE BANK BUILDING  
P. O. BOX 951  
KNOXVILLE, TENNESSEE 37901  
TELEPHONE 615-637-4311

'84 AGO 24

FILE NO. 24566.3

DIRECT DIAL NO. 202 955-1564

OFFICE OF SERVICE  
DOCKETING & SERV  
BRANCH

August 23, 1984

In the Matter of  
Long Island Lighting Company  
(Shoreham Nuclear Power Station, Unit 1)  
Docket No. 50-322-1 (OL)

Hon. Lawrence Brenner, Esq.  
Administrative Judge  
Atomic Safety and Licensing  
Board  
U.S. Nuclear Regulatory  
Commission  
Washington, D.C. 20555

Hon. Dr. Peter A. Morris  
Administrative Judge  
Atomic Safety and Licensing  
Board  
U.S. Nuclear Regulatory  
Commission  
Washington, D.C. 20555

Hon. Dr. George A. Ferguson  
Administrative Judge  
School of Engineering  
Howard University  
2300 - 6th Street, N.W.  
Washington, D.C. 20059

Dear Administrative Judges:

I am enclosing a Master Table of Contents, as requested by Judge Morris, for all of the testimony filed by Lilco on the crankshafts, pistons, cylinder heads and cylinder blocks. I trust that this Master Table of Contents will be of use to all parties in reviewing Lilco's testimony.

Very truly yours,

*E. Milton Farley, III*  
E. Milton Farley, III

Enclosure

cc: Service List

8408280492 840823  
PDR ADOCK 05000322  
G PDR

*add your  
to CA*

*DS03*

DOCKETED  
USNRC

'84 AGO 24 A10:42

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

LILCO, August 23, 1984

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)                          | ) |                       |

MASTER TABLE OF CONTENTS FOR TESTIMONY  
ON BEHALF OF LONG ISLAND LIGHTING  
COMPANY ON CRANKSHAFTS, PISTONS,  
CYLINDER HEADS AND CYLINDER BLOCKS

*dupe*

MASTER TABLE OF CONTENTS

Crankshafts

Testimony of Roger L. McCarthy, Paul R. Johnston, Eugene F. Montgomery and Simon K. Chen on Behalf of Long Island Lighting Company on Suffolk County's Contention Regarding Replacement Crankshafts on Diesel Generators at Shoreham

|      |   |    |
|------|---|----|
| I.   | Introduction of Witnesses.....  | 1  |
| II.  | Background.....   | 7  |
| III. | Design Requirements.....  | 10 |
|      | A. The Crankshafts Must Comply With Dema.....   | 10 |
|      | B. The Crankshafts Do Not Have To Comply With ABS, Lloyd's, IACS or the Criteria Used By FEV.....                       | 12 |
| IV.  | The Crankshafts Comply With Dema.....   | 20 |
| V.   | The Fatigue Analysis and Field Testing of the Crankshafts Show That The Crankshafts Will Not Fail During Operation..... | 31 |
| VI.  | Conclusion.....   | 42 |

Testimony of Clifford H. Wells, Duane P. Johnson, Harry F. Wachob, Craig Seaman, Dominic Cimino, and N. Ken Burrell on Behalf of Long Island Lighting Company Concerning Shotpeening of the Replacement Crankshafts

|      |   |    |
|------|---|----|
| I.   | Introduction Of Witnesses.....                              | 1  |
| II.  | Background.....   | 5  |
| III. | The Re-Shotpeening And Its Effect Upon The Crankshafts..... | 8  |
| IV.  | Conclusion.....   | 22 |

TESTIMONY OF EDWARD J. YOUNGLING, AND FRANZ F. PISCHINGER ON BEHALF OF LONG ISLAND LIGHTING COMPANY ON SUFFOLK COUNTY'S CONTENTION REGARDING REPLACEMENT CRANKSHAFTS ON DIESEL GENERATORS AT SHOREHAM



Pistons

Testimony of David O. Harris, Duane P. Johnson,  
Roger L. McCarthy, Franz F. Pischinger, Craig K.  
Seaman, Lee A. Swanger and Edward J. Youngling  
on Behalf of Long Island Lighting Company on  
Suffolk County Contention Regarding AE Piston  
Skirts on Diesel Generators at Shoreham

|      |  |    |
|------|--|----|
| I.   | Introduction of Witnesses.....   | 1  |
| II.  | Background.....  | 7  |
| III. | FaAA's Crack Initiation and Growth Analyses<br>Show Cracks In The AE Piston Skirts Might<br>Initiate, But Will Not Grow..... | 13 |
|      | A. General Approach And Assumptions.....   | 13 |
|      | B. Experimental Procedures.....  | 22 |
|      | C. Numerical Procedures.....   | 25 |
|      | 1. Isothermal Analysis.....  | 28 |
|      | 2. Crown/Skirt Interaction Model.....  | 32 |
|      | D. Fatigue Crack Initiation Analysis.....  | 39 |
|      | E. Fatigue Crack Growth Analysis.....  | 44 |
| IV.  | Operating Experience.....  | 50 |
| V.   | Side Thrust Load Is Not A Design Or Operation<br>Problem With The AE Pistons At Shoreham.....                                | 58 |
|      | A. Shoreham AE Piston Skirt.....   | 58 |
|      | B. FaAA Analysis.....  | 64 |
| VI.  | Tin Plating On The AE Pistons At Shoreham<br>Will Not Lead To Failure.....   | 66 |
| VII. | Conclusion.....  | 72 |

Cylinder Heads

Testimony of Craig K. Seaman, Edward J. Youngling,  
John C. Kammeyer, Clifford H. Wells, Lee A. Swanger,  
John F. Wallace, Clinton S. Mathews and Franz C. Pischinger  
For Long Island Lighting Company On Suffolk County Contention  
Regarding Cylinder Heads On Diesel Generators At Shoreham

|      |  |    |
|------|--|----|
| I.   | Background.....  | 7  |
| II.  | Improved Delaval Production Techniques<br>Minimize The Potential For Leakage.....  | 17 |
| III. | The Replacement Cylinder Heads Are<br>Adequately Designed.....   | 47 |
|      | A. The Ranges And Dimensions Of The<br>Firedeck Provide For Adequate Cooling<br>Of The Firedeck And Adequate Resistance<br>To Mechanical Loads And Do Not Create<br>Stress Risers..... | 47 |
|      | B. Non-Uniform Bolt Spacing Has No Effect<br>On Stresses In The Cylinder Head.....   | 51 |
| IV.  | The Operating Record Of The New Heads<br>Demonstrates That Leakage In The New Heads<br>Should Not Occur At Shoreham.....   | 62 |
| V.   | Barring-Over Will Detect Leaks.....  | 71 |
| VI.  | Leaks From Casting Defects Will Not<br>Develop While The Diesels Are In Standby.....   | 76 |
| VII. | Cracks Developing In The Cylinder Heads<br>During Operation Will Not Prevent The<br>Diesels From Performing Their Required<br>Function.....  | 89 |
| IX.  | None Of Shoreham's Replacement Cylinder<br>Heads Has A Relevant Indication.....  | 93 |
| X.   | The Replacement Cylinder Heads Were<br>Adequately Inspected After Operation.....   | 94 |
| XI.  | Conclusion.....  | 99 |

Cylinder Blocks

Testimony of Roger L. McCarthy,  
Charles A. Rau, Clifford H. Wells,  
Harry F. Wachob, Duane Johnson,  
Robert K. Taylor, Craig K. Seaman,  
Edward J. Youngling and Milford H.  
Schuster on Behalf of Long Island  
Lighting Company on Suffolk County  
Contention Regarding Cylinder Blocks

|      |  |    |
|------|--|----|
| I.   | Introduction.....  | 1  |
| II.  | Description Of The Cylinder Blocks.....  | 8  |
| III. | Operating Experience Of TDI Engines.....   | 10 |
| IV.  | FaAA's Analysis Of Ligament And Stud-to-Stud<br>Cracks In The EDG Cylinder Blocks..... | 22 |
|      | A. Evaluation Of Load Factors.....   | 22 |
|      | B. Strain Gage Testing.....  | 26 |
|      | C. Metallurgical Analysis.....   | 29 |
|      | D. Finite Element Analysis.....  | 42 |
|      | E. Cumulative Damage Analysis.....   | 48 |
| V.   | FaAA's Analysis Of The Cam Gallery Cracks.....   | 61 |
| VI.  | The Replacement EDG 103 Block Has Been<br>Adequately Tested.....                       | 68 |
| VII. | The TDI EDGs Are Qualified For Nuclear Service.....                                    | 71 |