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APPEARANCES:

On behalf of the Applicant:

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On behalf of the Nuclear Regulatory Commission Staff:

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## C O N T E N T S

	<u>DIRECT</u>	<u>CROSS</u>
2	<u>WITNESSES:</u>	
3	LILCO Panel on Cylinder Blocks	
4	Roger Lee McCarthy )	
5	Harry Frank Wachob )	
6	Charles A. Rau )	
7	Clifford H. Wells )	
8	Edward J. Youngling)	
9	Craig K. Seaman )	
10	Duane P. Johnson )	
11	Milford H. Schuster)	
12	By Mr. Farley	24369
13	By Mr. Dynner	24373
14	<u>DOCUMENTS INSERTED:</u>	
15	Prefiled testimony of LILCO Panel on Cylinder	
16	Blocks (see above) with attachments, and	
17	supplemental testimony, and errata	(Fls Page 24372)
18	Luncheon Recess	24422
19	Afternoon recess	24469
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1 EXHIBITSFor Id.

- 2 Applicant's Cylinder Block
- 3 Exhibits B-1 through B-50: 24372
- 4 B-1 through B-6 (Not used)
- 5 B-7 - Diagram (not otherwise identified)
- 6 B-8 - Diagram: Block top dimensions, Reference Block
- 7 B-9 - Section through cylinder head stud
- 8 B-10 - Section through non-stud region
- 9 B-11 - Cylinder liner
- 10 B-12 - Effect of section thickness on tensile strength
- 11 of gray cast iron
- 12 B-13 - Engine 101 load history, SNPS
- 13 B-14 - Engine 102 load history, SNPS
- 14 B-15 - Engine 103 load history, SNPS
- 15 B-16 - SNPS DG101 crack map
- 16 B-17 - SNPS DG102 crack map
- 17 B-18 - SNPS DG103 crack map
- 18 B-19 - Diagram: typical example of a ligament crack
- 19 B-20 - Diagram: stud-to-stud cracking in SNPS DG103
- 20 B-21 - Component task evaluation rpt Q-410, 12 pgs
- 21 B-22 - Strain gage placement, Rosette and Compliance
- 22 B-23 - Strain gage placement: uniaxial
- 23 B-24 - Typical cross-section of V-shape crack
- 24 B-25 - DNPS DG103 crack map, 9/22/84
- 25 B-26 - Strain vs load, Gages 8, 9, 10
- 26 B-27 - Strain vs load, Gages 11, 12, 13

- 1 WRBagb 1 B-28 - Strain/stress vs. load (Gage 3)
- 2 B-29 - Principal stresses vs. load for Gages 8, 9, 10
- 3 B-30 - Principal stresses vs. load for Gages 11, 12, 13
- 4 B-31 - Strain/stress vs. load (Gage 3)
- 5 B-32 - (Deleted)
- 6 B-33 - Widmanstätten microstructure in DG103
- 7 B-34 - Microscopy comparison
- 8 B-35 - Details of Widmanstätten graphite
- 9 B-36 - Microstructure of DG101
- 10 B-37 - Microstructure of DG102
- 11 B-38 - Comparison of eutectic cell boundaries
- 12 B-39 - Schematic drawing of specimen location from DG103  
13 segment removed from between Cyls 6 and 7
- 14 B-40 - Summary of tensile tests
- 15 B-41 - (Deleted)
- 16 B-42 - Strain-life data for TDI gray cast iron
- 17 B-43 - Reversals to failure
- 18 B-44 - Alternating stress intensity range
- 19 B-45 - Diagram (not otherwise identified)
- 20 B-46 - Perspective view of 3-dimensional block top model
- 21 B-47 - 2-dimensional block top model with internal  
22 pressure equal
- 23 B-48 - Factors relating stress measured at Shoreham  
24 Gage 13 to block top crack sites
- 25 B-49 - Goodman-Smith diagram for low cycle fatigue at  
26 100% load for Shoreham DG-101 and DG-102

1 WRBagb 1 B-50 - Goodman-Smith diagram for high cycle fatigue  
2 at 100% load for Shoreham engines DG101 and DG102  
3 B-51 - Ltr to Proj Engr, LILCO, SNPS, re: Two-year  
4 operating cycle, EDGs, SNPS, 12/15/83, with  
5 attachments (13 pgs)  
6 B-52 - (Deleted)  
7 B-53 - (Deleted)  
8 B-54 - (Deleted)  
9 B-55 - (Deleted)  
10 B-56 - (Deleted)  
11 B-57 - (Deleted)  
12 B-58 - (Deleted)

13 Suffolk County Exhibits:

For Id.

14 Diesel Exhibit D-73 - Liquid Penetrant Exam Rpt. 24398  
15 Cyl liner landing, Cyl #7,  
16 DG102, 2/10/84  
17 D-74 - TER Q-329: Liquid Penetrant 24445  
18 Exam Rpts, Cyl block liner  
19 landing, Cyl #2, #3, #4, #5  
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1 the knowledge of the bases for the conclusion that no  
2 cracks were found or anything else on those other engines.

3 BY MR. DYNNER:

4 Q Dr. Wells, were any cracks found in the engine  
5 block at Catawba?

6 A (Witness Wells) The block top inspections at  
7 Catawba revealed no cracks. These inspections were  
8 witnessed by an engineer under our supervision, Dr. Lee  
9 Swanger.

10 Q Were any other cracks found in the block at  
11 Catawba beside the block top? My question was, any cracks  
12 at all in the engine block at Catawba?

13 A I am unaware of any records of cracks in the  
14 blocks at Catawba.

15 Q Were any cracks found in the blocks at River  
16 Bend?

17 A I'm aware of the inspection records on one block  
18 and no cracks have been found on that block.

19 Q Would you identify the document that you're  
20 reading from?

21 A I am reading the notes compiled for my benefit on  
22 the inspection summaries of River Bend, Shearon Harris,  
23 Catawba, Grand Gulf, Comanche Peak, Plant Vogtle, and San  
24 Onofre.

25 Q Did you personally compile that data and do you



2 AGBpp 1 have personal knowledge of it?

2 A I have personally reviewed the inspection records  
3 of some, but not all, of these inspections. We have through  
4 the diesel generator owner's group DR/QR program received  
5 all the inspection reports from these plants. Some of them  
6 I have gone through and some I have not.

7 Q Were any cracks found in the blocks at Comanche  
8 Peak?

9 A There were indications of casting defects found  
10 in one block top at Comanche Peak.

11 Q Were any cracks found in the block at Grand Gulf?

12 A No block top cracks had been found at Grand Gulf  
13 and they have been inspected by liquid penetrant. I believe  
14 that is just for one engine, that would be two blocks.

15 Q You just said block top. I asked you whether any  
16 cracks were found anywhere in the block; do you know?

17 A I can't assert that, no.

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