LILCO, February 17, 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)	)	
	)	

REQUEST FOR PRODUCTION OF DOCUMENTS

TO: Alan R. Dynner, Esq.
Kirkpatrick, Lockhart, Hill,
Christopher & Phillips
1900 M Street, N.W.
Washington, D.C. 20036

Long Island Lighting Company requests that Suffolk County produce and permit LILCO to inspect and copy the documents in their possession described below.1/

1/ Many of the following Requests refer to specific paragraphs in the proposed contentions. In each such instance, SC need not produce the documents cited in each paragraph of the contention, though its response to this Request for Production should list those documents if they are responsive. Moreover, in many instances, individual paragraphs of a contention do not make any specific claim that the alleged defect or condition exists on the Shoreham diesels. If the County does not claim that a particular defect or condition exists at Shoreham, the response to the paragraph in question should so state and no documents need be produced.

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Paragraph I.A of Contention I

1. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph I.A.1 of Contention I that, "the replacement crankshafts currently installed in the EDGs are incapable of operating for a two hour per twenty-four period at overload (3900 KW) as required by FSAR § 8.3.1.1.5, without the development of a nucleation site."

2. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.A.1 of Contention I that "the design of those [13" X 12"] crankshafts is marginal for operation at 3500 KW."

3. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.A.1 of Contention 1 that "the replacement crankshafts . . . , because of their greater weight . . . , will cause excessive wear on the main bearing between the number 4 and number 5 cylinders."

4. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.A.2 of Contention I that "the replacement crankshafts . . . , because of . . . the effect of 'crankshaft whirl,' will cause

excessive wear on the main bearing between the number 4 and number 5 cylinders."

5. Reports, memoranda and calculations which Suffolk County relies in support of its allegation in paragraph I.A.2 of Contention I that "the replacement crankshafts . . . , because of their greater weight . . . , will cause . . . loosening of the main bearing."

6. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.A.2 of Contention I that "the replacement crankshafts . . . , because of their greater weight . . . , will cause . . . crankshaft misalignment."

7. Reports, memoranda and calculations which Suffolk County relies upon in support of allegation in paragraph I.A.4 of Contention I that the "replacement cylinder heads are of inadequate design and manufacture to withstand satisfactorily thermal and mechanical loads during EDG operation."

8. Reports, memoranda and calculations which Suffolk County relies upon in support of its contention in paragraph I.A.5 of Contention I that "the interrelationship of the crankshaft, pistons, and cylinder heads and other components during operation may exacerbate the weaknesses of major components."

Paragraph I.B of Contention I

9. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph I.B.1 of Contention I that exhaust gas temperatures for the Shoreham diesel generators "are very high (approximately 1100 F) and indicative of over-rating."

10. Reports, memoranda and calculations on which Suffolk County relies in support of its allegations in paragraph I.B.2 of Contention I that "the TDI diesel engines on the Columbia were derrated to increase reliability in response to those problems."

11. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.B.3 of Contention I that the Shoreham diesel generators "have experienced excessive vibration."

12. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph I.B.3 of Contention I that the Shoreham diesel generators have experienced "variations in the vibration levels among the three EDG's."

Paragraph II.A of Contention II

13. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph II.A.1 of Contention II that the design of the connecting rod bearings "will not ensure correct lubrication."

14. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph II.A.1 of Contention II that the connecting rod bearing matter "has been only partially remedied and will not ensure correct lubrication."

15. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph II.A.2 of Contention II that the location of the jacket water pump is improper and "exacerbates the deleterious effect of vibrations."

16. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph II.A.2 of Contention II that location of the jacket water pump caused or played any role in the "scoring indications caused by slippage of the impeller on the shaft."

17. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph II.A.3 of Contention II that the redesign of the capscrew and modifications to the rocker arm holddown assembly "transfer the sheer loading from the rocker shaft bolts to, and may overstress, the cylinder head subassembly."

18. Paragraph II.A.4 of Contention II does not appear to allege that the current shrouded fuel lines are improperly designed. If such an allegation is intended, however, LILCO requests all reports, memoranda and calculations on which Suffolk County relies in support of any such allegation.

19. Paragraph II.A.5 of Contention II does not appear to allege that the current design capscrew is too long or improperly designed. If such an allegation is intended, however, LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any such allegation.

20. Paragraph II.A.6 of Contention II does not appear to allege that the currently installed cable is inadequate in any respect. If such an allegation is intended, however, LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any such allegation.

21. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph II.A.7 of Contention II that "exfoliation of the hardened surface material on camshaft lobes on EDG 101 is evidence of improper design."

22. Reports, memoranda and calculations which Suffolk County relies upon in support of its allegation in paragraph II.A.8 of Contention II that the modified design of the lubricating oil system for the turbocharger thrust bearings "could lead to blockage of oil."

23. Reports, memoranda and calculations which Suffolk County relies upon in support of any allegation that the tubing referred to in paragraph II.A.9 of Contention II as modified and currently existing experiences excessive vibration or is indicative of poor design and manufacturing.

24. Paragraph II.A.10 of Contention II makes no specific allegation that the baseplate of EDGs 102 and 103 were improperly designed. Also, the County makes no specific allegations that the baseplates for these engines are now inadequate to perform their intended functions. If such allegations are intended, however, LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any such allegations.

25. The memorandum cited by Suffolk County in support of paragraph II.A.11 of Contention II indicates that improper installation was the likely cause of the failure, not design deficiency. If Suffolk County nonetheless contends that failure occurred as a result of design deficiency, LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any allegation that the turbocharger holddown bolts were deficiently designed.

26. Paragraph II.A.12 of Contention II does not specifically allege that cylinder liners in all three EDGs were deficiently designed. If such an allegation is intended, however, LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any such allegation.

27. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph II.A.13 that the specific modifications listed in subparagraphs (a)-(j) "reflect(s) . . . deficiencies in the design of the TDI EDGs."

Paragraph II.B of Contention II

28. The Shoreham pistons do not use spherical washers referred to in paragraph II.B.1 of Contention II. If Suffolk

County contends that the use of spherical washers at Grand Gulf which are not used at Shoreham reflects deficient design of the Shoreham TDI diesels, then LILCO requests the reports, memoranda and calculations on which Suffolk County relies in making any such allegation.

29. The governor lube oil cooler assembly referred to in paragraph II.B.2 of Suffolk County proposed Contention II is positioned in a location on the Shoreham diesel generators different from the location of such assembly on the engines covered by the referenced Part 21 report. If Suffolk County nonetheless contends that a Part 21 report that did not apply at Shoreham reflects any design deficiency with respect to the Shoreham diesel generators, then LILCO requests the reports, memoranda and calculations on which Suffolk County relies in support of any such allegation.

30. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegations in paragraph II.B.3 of Contention II that design problems pertaining to the connecting push-rod welds at Grand Gulf exist in the Shoreham diesels and that the new intermediate push rods ordered by LILCO are defectively designed.

31. If Suffolk County contends in paragraph II.B.4 of Contention II that failures of jacket water pipe welds and turbocharger mounting bolts which occurred at Grand Gulf allegedly as a result of high turbocharger vibration levels exist at Shoreham, produce all reports, memoranda and calculations upon which Suffolk County relies in support of such allegation.

32. Paragraph II.B.5 of Contention II does not allege that the air start valves at Shoreham have any deficiencies in design or operation. If, however, Suffolk County contends that the air start valves in the Shoreham diesels have the same design defects as those at Grand Gulf, produce all reports, memoranda and calculations upon which Suffolk County relies in support of such allegation.

33. Paragraph II.B.6 of Contention II does not allege that the lack of Class IE power present at Perry applies to the Shoreham diesel generator control circuits. Shoreham uses Class IE power for diesel generator control circuits. If, however, Suffolk County alleges in paragraph II.B.6 of Contention II that the design defects alleged to have occurred at Perry exist at Shoreham, produce all reports, memoranda or calculations upon which Suffolk County relies in support of such allegation.

34. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.B.7 of Contention II that the design defect resulting in failure of the sheared bolt on the rear crankcase cover at Grand Gulf exist in the bolts on the rear crankcase cover at Shoreham. Also, if the County alleges that the generator damage that occurred at Grand Gulf could occur at Shoreham, produce reports, memoranda and calculations upon which Suffolk County relies in support of such an allegation.

35. The fuel oil line arrangement for the V-16 engine at Grand Gulf, which is the subject of paragraph II.B.8 of Contention II, differs from that on Shoreham's diesels. If, however, Suffolk County alleges in paragraph II.B.8 of Contention II that any design defect causing crack initiation, propagation and ultimate failure in the main fuel supply tubing at Grand Gulf existed at Shoreham, produce reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

36. The pressure sensing line between the starting air storage tank and the starting air compressor at Shoreham is seismically supported. If, however, Suffolk County alleges in paragraph II.B.9 of Contention II that there is any design defect in that pressure sensing line such as existed at Grand

Gulf, produce all reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

37. Class IE cable has been used in the diesel generator control circuits at Shoreham and, therefore, the problem described in paragraph II.B.10 of Contention II is inapplicable to the Shoreham diesels. If, however, Suffolk County contends otherwise, produce reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

38. The Shoreham diesels do not have link rod assemblies such as are used on the "V" engines described in the Part 21 report to which paragraph II.B.11 of Contention II refers. If, however, Suffolk County contends that there is any defect in the design of the link rod assembly at Grand Gulf which is applicable to the design of the Shoreham engines, produce all reports, memoranda and calculations upon which Suffolk County relies in support of such allegations.

39. The flexible drive coupling on the Shoreham diesels are made of neoprene which is not susceptible to the type of deterioration that occurred on the isoprene flexible drive couplings at Catawba. If, however, Suffolk County contends that the flexible couplings on the Shoreham diesels

are defectively designed produce reports, memoranda and calculations on which the County relies in support of any such allegation.

40. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegations, if any, II.B.13 of Contention II that the rotor, stator and AC box on the Shoreham diesels have dimensional, electrical and specification deficiencies resulting from design defects similar to those alleged to have been experienced at the Shearon Harris Plant.

41. Shoreham uses different air check valves than those described in the Part 21 report to which paragraph II.B.14 of Contention II refers. If, however, Suffolk County alleges in paragraph II.B.14 of Contention II that air check valves on the Shoreham diesels leak as a result of any design defect, produce all reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

42. Shoreham's pneumatic logic is of a different design than that at Grand Gulf. If, however, Suffolk County contends in paragraph II.B.15 of Contention II that the pneumatic logic at Shoreham is defectively designed in a manner similar to that alleged at Grand Gulf, produce all reports,

memoranda and calculations upon which Suffolk County relies in support of its allegation.

43. Paragraph II.B.16 of Contention II does not allege that the relay tachometer at Shoreham is defective. If, however, Suffolk County contends that the relay tachometer at Shoreham was defectively designed as was the relay tachometer at Grand Gulf, produce all reports, memoranda and calculations upon which Suffolk County will rely in support of any such allegation.

Paragraph II.C of Contention II

44. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.1 of Contention II that failures of bolting mechanisms and crown-to-skirt oil seals in pistons on the M.V. Columbia are attributable to TDI design deficiencies which exist in bolting mechanisms and crown-to-skirt oil seals in the pistons on the Shoreham diesels.

45. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.2 of Contention II that the design defect resulting in piston rings on the M.V. Columbia requiring frequent change out and scrapping due to accelerated wear and chrome flaking

embedded in the piston crown exist with respect to piston rings on the Shoreham diesels.

46. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.3 of Contention II that the design defect resulting in cylinder heads on the M.V. Columbia having a high failure and removal rate exist with respect to cylinder heads on the Shoreham diesels.

47. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.4 of Contention II that design defects resulting in galling and scoring, premature wear, deformation, chrome flaking, incomplete combustion and operational problems in cylinder liners on the M.V. Columbia exist in cylinder liners on the Shoreham diesels.

48. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.5 of Contention II that design defects causing connecting rods and related components on the M.V. Columbia to crack and fail due to high stress loading exist in connecting rods on the Shoreham diesels.

49. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.6 of Contention II that design defects causing cylinder blocks on the M.V. Columbia to crack due to high stresses from cylinder head hold down forces exist in the cylinder blocks on the Shoreham diesels.

50. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.7 of Contention II that design defects causing turbocharger failures on the M.V. Columbia exist in turbochargers on the Shoreham diesels.

51. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.8 of Contention II that design defects causing cam lobes on the M.V. Columbia to be worn beyond acceptable limits exist in cam lobes on the Shoreham diesels.

52. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.9 of Contention II that design defects causing main bearings on the M.V. Columbia to wear prematurely due to high carbon loading imposed on the lube oil and failure of the lube oil system to continuously purify the lube oil exist on the Shoreham diesels.

53. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.10 of Contention II that design defects causing carbon build-up on the valve stems and stuck valves and guide damage on the M.V. Columbia exist on the Shoreham diesels.

54. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.11 of Contention II that design defects causing connecting rod bearings on the M.V. Columbia to incur excessive wear exist in the new connecting rod bearings on the Shoreham diesels.

55. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.i.12 of Contention II that design defects on the M.V. Columbia engines resulting in excessive major overhauls exist with respect to the Shoreham diesels.

56. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.1 of Contention II that design defects causing stellite valve seats in the cylinder heads on the M.V. Pride of Texas to crack from exhaust valve failures exist in the cylinder heads on the Shoreham diesels.

57. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.2 of Contention II that design defects causing the fuel cam roller on the M.V. Pride of Texas to "[ride] either at or over the edge of the cam, greatly stressing both the lobe and the roller" exist on the Shoreham diesels.

58. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.3 of Contention II that design defects causing the tappet assembly rollers on the M.V. Pride of Texas to be severely galled exist on the Shoreham diesels.

59. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.4 of Contention II that design defects causing the chrome plating to flake off piston pins in the M.V. Pride of Texas exist with respect to the piston pins on the Shoreham diesels.

60. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.5 of Contention II that design defects causing the intercoolers on the M.V. Pride of Texas to fail as a result of "erosion of the tubes caused by fluid velocity and debris in

the fresh water system" exist in the intercoolers on the Shoreham diesels.

61. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.6 of Contention II that design defects causing valves on the M.V. Pride of Texas to fail exist on the Shoreham diesels.

62. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.7 of Contention II that design defects causing excessive engine vibration on the M.V. Pride of Texas resulting in failure of components exist with respect to the Shoreham diesels.

63. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.8 of Contention II that design defects causing crankshaft plugs on the M.V. Pride of Texas to crack from improper use of gauge material exist on the Shoreham diesels.

64. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.9 of Contention II that design defects causing failures of the wall tubing of fuel oil return lines on the M.V. Pride of Texas exist on the Shoreham diesels.

65. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.10 of Contention II that design defects causing control system circuitry on the M.V. Pride of Texas to fail to identify signals exist in the control system circuitry on the Shoreham diesels.

66. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.11 of Contention II that design defects causing the cylinder blocks to fail on the M.V. Pride of Texas exist on the Shoreham diesels.

67. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.12 of Contention II that design defects causing piston skirts on the M.V. Pride of Texas to crack exist in the new model "AE" piston skirts on the Shoreham diesels.

68. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.ii.13 of Contention II that design defects causing a cylinder liner on the the M.V. Pride of Texas to crack exist in the cylinder liners on the Shoreham diesels.

69. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.iii.1 of Contention II that design defects causing cylinder heads on the the M.V. Star of Texas to crack exist in the cylinder heads on the Shoreham diesels.

70. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.iii.2 of Contention II that design defects causing piston skirts on the M.V. Star of Texas to crack at the termination of the fillet exist in the new model "AE" piston skirts on the Shoreham diesels.

71. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.iii.3 of Contention II that design defects causing the clutch on the the M.V. Star of Texas to fail due to excessive vibration exist on the Shoreham diesels.

72. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.iii.4 of Contention II that design defects causing turbochargers on the the M.V. Star of Texas to experience difficulty supplying sufficient air exist in the turbochargers on the Shoreham diesels.

73. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph II.C.iv of Contention II that design defects causing cylinder heads to crack on the the M.V. Edwin H. Gott exist with respect to cylinder heads on the Shoreham diesels.

Paragraph III.A of Contention III

74. Reports, memcranda and calculations on which Suffolk County relies in support of its allegation in paragraph III.A.1 of Contention III that the cylinder heads cracked "due in part to poor casting techniques."

75. FaAA's final connecting rod bearing report indicates that the voids found in the Shoreham connecting rod bearings were not atypical of cast aluminum bearings. If Suffolk County alleges that this conclusion is incorrect, produce reports, memoranda and calculations which support its allegation. Also produce reports, memoranda and calculations indicating that the voids in the connecting rod bearings would be detrimental to the life of the bearings given the anticipated stresses on them.

76. The FaAA final report on the connecting rod bearings indicates that the replacement connecting rod bearings have a predicted life of 38,000 hours. If Suffolk Cunty

alleges that this conclusion is incorrect, produce reports, memoranda and calculations on which it relies in support of its allegation.

77. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph III.A.3 of Contention III that cracking in the pistons was caused "in part by poor manufacturing techniques."

78. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegations in paragraph III.A.4 of Contention III that the high pressure fuel line failed, that the high pressure fuel line contained a crack "that propagated from a tool mark," or that the failure of the high pressure fuel line was caused by that crack.

79. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.4 of Contention III that the tool mark which allegedly caused the crack resulting in the fuel line failure at Grand Gulf resulted from the same manufacturing technique which caused the alleged propagation of the crack in the high pressure fuel line at Shoreham.

80. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph

III.A.4 of Contention III to show the relationship, if any, between the fuel oil line arrangement at Grand Gulf and that at Shoreham or the relationship between the manufacture of the high pressure fuel line used at Grand Gulf and that used at Shoreham.

81. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.5 of Contention III that:

(a) there was mechanical damage to the insulation on the rotor pole causing low-megger readings;

(b) the mechanical damage alleged to the insulation was caused "in part" by a sharp corner located close to the window; and

(c) the mechanical damage to the insulation was caused "in part" by the "marginal quality of workmanship in fabrication of the pole piece."

82. Reports, memoranda and calculations upon which Suffolk County relies to support its allegation in paragraph III.A.5 of Contention III that the mechanical damage to the insulation on the rotor pole was caused by anything other than

an isolated occurrence and, therefore, has any import with respect to the overall reliability of the generator.

83. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.6 of Contention III that the groove on the cylinder liner "was attributed to improper machine shop processes."

84. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.6 of Contention III that the groove on the cylinder liner would have any effect on the reliable operation of the piston and, therefore, the diesel generator's operation.

85. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.7 of Contention III that cracks occurring in the web of the bridge between the two sides of the subcover assembly at the fuel injector indentation have any impact on diesel operation or that the crack resulted from improper manufacture.

86. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.8 of Contention III and indicating that:

(a) the failure of two cylinder head nuts was attributable to a manufacturing defect;

(b) there is or has been any manufacturing defect with respect to any of the cylinder head nuts currently in the diesel generators; or

(c) any such defect existing in the present cylinder head nuts would cause a failure, if at all, at any time other than torquing during installation.

87. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.9 of Contention III that "a mandatory hole was not drilled through the pipe due to a shop fabrication error," or any of the following:

(a) that the lack of such hole has not been corrected;

(b) that the lack of such hole has or will have any effect upon the operation of the diesel generators;

(c) that the alleged fabrication error was not discovered and corrected in the

normal course of LILCO's initial check-out program; or

(d) that the alleged shop fabrication error affected any other part of the diesel generators.

88. Paragraph III.A.10 of Contention III does not appear to allege that the currently-installed camshaft lobes are inadequate in any respect. If such allegation is intended, however, LILCO requests that Suffolk County produce all reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.10 of Contention III that "exfoliation of the hardened surface material on camshaft lobes on EDG 101 may have resulted in part from ineffective heat treatment, a manufacturing deficiency," or in support of any of the following:

(a) that exfoliation of the type observed at Shoreham would in any way affect the reliability and operation of the Shoreham diesel generators; or

(b) that any similar exfoliation or alleged manufacturing deficiency exists in EDG 102 or 103.

89. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.A.11 of Contention III that "several injector tips were improperly manufactured," that the alleged improper manufacture of these injector tips affects the reliability or operation of the diesel generators.

90. Reports, memoranda and calculations upon which Suffolk County relies in support of any allegation in paragraph III.A.12 of Contention III that the tubing described in paragraph II.A.9 of Contention II as modified and currently existing experiences excessive vibration or is indicative of poor design and manufacturing.

91. If paragraph III.A.12 of Contention III intends to allege that the base plate of EDGs 102 and 103 were improperly manufactured, produce all reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

92. If paragraph III.A.12 of Contention III intends to allege that cylinder liners in all three EDGs were deficiently or improperly manufactured, produce all reports, memoranda or calculations upon which Suffolk County relies in support of any such allegation.

Paragraph III.B of Contention III

93. Reports, memoranda and calculations upon which Suffolk County relies in support of any allegation in paragraph III.B.1 of Contention III that "residual stress caused by the improper method of heat treating of piston skirts could result in cracking" in the diesel generators at Shoreham or that the condition identified in the Part 21 report cited by the County in this contention is applicable to the AE type pistons now installed at Shoreham.

94. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.B.2 of Contention III that the partial separation of a piston crown from a piston skirt at Grand Gulf "due to the failure of one of the four attachment stud bolts" caused "in part by an improperly manufactured spherical washer assembly," is related to any condition existing at Shoreham and indicating:

(a) that spherical washers of the type used at Grand Gulf are installed in the AE pistons now installed at Shoreham, or

(b) that the manufacturing defect alleged by the County to have caused the

condition at Grand Gulf is related to or affects the operation of the pistons in any of the diesels at Shoreham.

95. Reports, memoranda and calculations upon which Suffolk County relies in support of the allegation in paragraph III.B.3 of Contention III that "valve springs installed on the engine cylinder head assembly were improperly manufactured" on other diesels and that the condition alleged in this paragraph exists at Shoreham.

96. If Suffolk County alleges in paragraph III.B.4 of Contention III that the failure of spherical washers attached to a piston which occurred at Grand Gulf relates in any way to the reliability or operation of the AE type pistons at Shoreham, produce reports, memoranda or calculations supporting any such allegation.

97. If the County contends in paragraph III.B.4 of Contention III that failures of jacket water pipe welds and turbocharger mounting bolts which occurred at Grand Gulf allegedly as a result of high turbocharger vibration levels are related to the reliability or operation of the diesel generators at Shoreham, produce reports, memoranda or calculations upon which Suffolk County relies in support of such allegations.

98. If Suffolk County alleges in paragraph III.B.4 of Contention III that the sheared bolt on the rear crankcase cover which failed at Grand Gulf allegedly due to a combination of metallurgical and vibrational factors and allegedly caused a generator short circuit at Grand Gulf is related to the reliability or operation of the diesel generators at Shoreham, produce reports, memoranda or calculations upon which Suffolk County relies in support of any such allegation.

99. If Suffolk County alleges in paragraph III.B.4 of Contention III that any manufacturing defect causing crack initiation, propagation and ultimate failure in the main fuel supply tubing as alleged to have occurred at Grand Gulf is related to the reliability or operation of the diesel generators at Shoreham, produce reports, memoranda or calculations upon which Suffolk County relies in support of any such allegation.

100. If Suffolk County alleges in paragraph III.B.4 of Contention III that air-check valves furnished by TDI to Shoreham leaked as a result of any manufacturing defect, produce reports, memoranda or calculations upon which Suffolk County relies in support of any such allegation.

Paragraph III.C of Contention III

101. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.1 that the cylinder head cracking occurring on the M.V. Columbia was similar or related to cylinder head cracking at Shoreham.

102. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.1 of Contention III that the fire-deck warping occurring on the M.V. Columbia was similar or related to fire deck warping at Shoreham.

103. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.1 that contaminant inclusion occurring on the M.V. Columbia was in any way related to contaminant inclusion at Shoreham.

104. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.1 that coreshifting occurring on the M.V. Columbia was in any way related to any similar condition at Shoreham.

105. If Suffolk County claims that the casting techniques used for the new cylinder heads at Shoreham do not prevent the alleged defects listed in paragraph III.C.i.1 of Contention III, produce reports, memoranda and calculations upon which Suffolk County relies in support of its allegations.

106. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.2 of Contention III that any of the following conditions alleged to have occurred on the M.V. Columbia exist on the diesel generators at Shoreham or that the alleged manufacturing techniques resulting in the defects on the M.V. Columbia were employed with respect to the Shoreham diesels and are indicative in any way of any problem with the reliability or operation of the diesel generators at Shoreham:

(a) piston rings requiring frequent change out and scrapping due to accelerated wear and chrome flaking imbedded in the piston crown;

(b) cylinder head failures, including head cracking and fire-deck warping;

(c) failure of cylinder liners, including galling and scoring, premature wear and liner deformation;

(d) failure of connecting rods and related components;

(e) cracking of cylinder blocks;

(f) failures of turbochargers, including leaking oil/air seals, bearings, nozzles, rotors/cracked casings and fasteners;

(g) cam lobes worn beyond acceptable limits;

(h) main bearings prematurely worn due to high carbon loading imposed on the lube oil;

(i) carbon build-up on valve stems causing stuck valves and guide damage.

107. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.ii.1 of Contention III that:

(a) galling of tappet assembly rollers occurring on the M.V. Pride of Texas exists or will occur at Shoreham;

(b) that the alleged inadequate heat treatment which caused galling of tappet assembly rollers on the M.V. Pride of Texas

is applicable to the Shoreham diesels and are indicative of any condition affecting the reliability or operation of the Shoreham diesels.

108. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.ii.2 that:

(a) two fuel cam failures occurring on the M.V. Pride of Texas indicate that similar failures have occurred or will occur at Shoreham;

(b) manufacturing techniques resulting in the two fuel cam failures on the M.V. Pride of Texas were employed with respect to the Shoreham diesels and are indicative of any condition affecting the reliability or operation of the Shoreham diesels.

109. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.ii.3 that:

(a) stress risers and piston disintergration failures occurring on the

M.V. Pride of Texas have occurred or will occur at Shoreham; or

(b) manufacturing techniques resulting in piston disintegration on the M.V. Pride of Texas were employed with respect to the "AE" pistons now installed on the Shoreham diesels.

110. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.4 that:

(a) a scuffed cylinder liner similar to that which occurred on the M.V. Pride of Texas exists or will occur at Shoreham;

(b) manufacturing techniques resulting in the scuffed cylinder liner on the M.V. Pride of Texas were employed with respect to the Shoreham diesels; or

(c) a scuffed cylinder liner of the type which occurred on the M.V. Pride of Texas could prevent the Shoreham diesels from performing their intended functions.

111. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.i.5 of Contention III that manufacturing defects causing any of the following conditions on the M.V. Pride of Texas exist or will occur at Shoreham and that the alleged manufacturing defects are in any way indicative of any lack of reliability with respect to the operation of the Shoreham diesel generators;

(a) chrome plating flaking off piston pins;

(b) failure of intercoolers;

(c) failures of couplings and clutch assembly resulting from excessive engine vibration;

(d) cracking of crankshaft plugs allegedly resulting from improper use of gauge materials;

(e) cylinder-block failure and cracks;

(f) cracking of piston skirts; and

(g) a cracked cylinder liner.

112. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.iii that any of the following conditions on the M.V. Star

of Texas were caused by manufacturing defects related to conditions existing with respect to the Shoreham diesel generators or that the manufacturing defects are indicative of any lack of reliability with respect to the operation of the Shoreham diesel generators:

(a) cracked cylinder heads;

(b) cracked piston skirts at the termination of the fillet radius; and

(c) clutch failure due to excessive vibration.

113. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph III.C.iv that casting stresses and aeration problems allegedly resulting in cracked cylinder heads on the M.V. Edwin H. Gott existed in the manufacture of the new cylinder heads now installed on the Shoreham diesels.

Paragraph IV.A of Contention IV

114. Reports, memoranda and calculations on which Suffolk County relies in support of its contention that any of the deficiencies and defects alleged in Contentions I, II and III were not detected through the QA program in effect and "would have been prevented or detected" by an "effective program."

115. For each of the alleged deficiencies or defects described in Contentions I, II and III, produce all reports, memoranda and calculations upon which Suffolk County relies to relate such defect or deficiency to a particular alleged failure in the QA program.

Paragraph IV.B of Contention IV

116. Paragraph IV.B.1 of Contention IV does not allege that the jacket water and lube oil pipes at Shoreham had welds in violation of applicable requirements. If, however, Suffolk County so contends, produce all reports, memoranda and calculations upon which Suffolk County relies in support of its allegation.

117. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.B.2 of Contention IV that "installation of the fitted cam gear bolts were not verified due to an error in shop QA procedures;" and any reports, memoranda and calculations indicating that:

(a) the fitted cam gear bolts are not now properly installed on the Shoreham diesels;

(b) the present condition of the fitted cam gear bolts adversely affects the timing of the diesel engines in any way; or

(c) a failure or omission of the bolts would result in a failure of the diesels to operate.

118. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.B.3 of Contention IV that "proper alignment of the engine governor drive was not verified due to an error in shop QA procedures which place excessive stress on the governor drive coupling, breaking the drive grid and causing the drive shaft key-key slot to wear;" and any reports, memoranda and calculations indicating that:

(a) the alignment of the engine governor drive is deficient or defective in its present condition; and

(b) the alignment of the engine governor drive in its present condition will adversely affect the reliability or operation of the diesels at Shoreham.

119. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.B.4 of Contention IV that the "excessive crankshaft thrust" was related to or resulted from an alleged QA deficiency at TDI. Also, if Suffolk County alleges that this condition has not been corrected, produce records, memoranda and calculations upon which Suffolk County relies in support of its allegations.

120. Shoreham does not have any battery racks associated with the diesel generators of the type alleged to be defective at Catawba in paragraph IV.B.5 of Suffolk County's Contention IV. If Suffolk County contends, however, that the alleged deficiencies with respect to such battery racks at Catawba relate to any conditions at Shoreham, produce reports, memoranda and calculations upon which Suffolk County relies in support of its allegation and in support of the allegation that any related deficiency in TDI's QA program related to or resulted in any deficiency in the diesel generators at Shoreham.

121. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.B.6 of Contention IV that pump motors at Shoreham failed to meet applicable requirements in any way similar to the alleged failure at Grand Gulf and that any alleged failure of the pump

motors at Shoreham to meet those requirements resulted from a deficiency in TDI's QA program.

122. Shoreham diesel generators do not have air check valves manufactured by William Powell Company such as those described in paragraph IV.B.7 of Contention IV. If, however, Suffolk County contends that there are defects in the air check valves on the Shoreham diesels and that such defects resulted from deficiencies in the QA program of TDI, produce reports, memoranda and calculations upon which Suffolk County relies in support of any such allegation.

123. Problems with the internal baffling of the heat exchangers similar to that noted in paragraph IV.B.8 of Contention IV have not been found at Shoreham. If Suffolk County, however, alleges that such defects exist at Shoreham and that the defects resulted in deficiencies in TDI's QA program, produce reports, memoranda and calculations upon which Suffolk County relies in support of its allegations.

124. Paragraph IV.B.9 of Contention IV does not allege that the condition with respect to the thrust bearings at WPPS exists in the Shoreham diesel generators. If, however, Suffolk County contends that there is any defect in the thrust bearing clearance at Shoreham and that such defect was a result of a

deficiency in the QA program of TDI, produce reports, memoranda and calculations upon which Suffolk County relies in support of its contention.

125. The switchgear components at Shoreham were not supplied by TDI and, therefore, are not subject to the allegations contained in paragraph IV.B.10 of Contention IV with respect to the switchgear components at River Bend. If, however, Suffolk County contends that there are defects in the switchgear components at Shoreham which resulted from a deficiency in the QA program of TDI, produce reports, memoranda and calculations upon which Suffolk County relies in support of any such allegations.

126. Paragraph IV.B.11 of Contention IV does not allege that defects exist at Shoreham in piping supports of the type alleged to have occurred at Comanche Peak. Additionally, the pipe supports on the Shoreham diesels are not required to meet the ASME III requirements. Nevertheless, if Suffolk County contends that there are defects in the pipe supports on the Shoreham diesels and that such defects resulted from a deficiency in the QA program of TDI, produce reports, memoranda and calculations upon which Suffolk County relies in support of its allegation.

127. Paragraph IV.B.12 of Contention IV does not allege that the governor problems described therein exist at Shoreham. If, however, Suffolk County contends that such defects in the governors exist on the Shoreham diesels and that such defects are a result of any deficiency in TDI's QA program, produce reports, memoranda and calculations upon which Suffolk County relies in support of such allegation.

128. Paragraph IV.B.13 of Contention IV does not allege that the problems with valve springs at River Bend exist on the Shoreham diesels. If, however, Suffolk County contends that such problems exist with respect to the Shoreham diesels and that such problems resulted from a deficiency in TDI's QA program, produce reports, memoranda or calculations upon which Suffolk County relies in support of such allegation.

129. Paragraph IV.B.14 of Contention IV does not allege that the problems with engine anchor bolts and nuts at Shearon Harris exist on the Shoreham diesels. If, however, Suffolk County contends that such problems exist with respect to the engine anchor bolts and nuts at Shearon Harris and that such problems resulted from a deficiency in TDI's QA program, produce reports, memoranda or calculations upon which Suffolk County relies in support of such allegation.

130. Reports, memoranda and calculations on which Suffolk County relies in support of its allegation in paragraph IV.B.15 of Contention IV that "rocker arm hold-down bolts on one cylinder head subcover failed during testing of EDG 101" as a result of a defect in the QA program of TDI, that the failure of such bolts was not promptly and properly discovered and that any defects presently exist in such bolts.

Paragraph IV. C of Contention IV

131. Reports, memoranda and calculations upon which Suffolk County relies in support of any allegation in paragraph IV.C.1 of Contention IV that any of the conditions described in the reports described in that paragraph exist at Shoreham, adversely affect the reliability and operation of the diesel generators and resulted from a deficiency in TDI's QA program.

132. Reports, memoranda and calculations that (a) indicate which findings of the I&E reports cited in paragraph IV.C.3 of Contention IV identify deficiencies in TDI's QA program, (b) support the allegation of a TDI QA deficiency, and (c) support the allegation that the alleged deficiency has not been corrected.

133. Suffolk County does not allege that any of the S&W audit findings referenced in paragraph IV.C.4 of Contention

IV had any impact on the reliability or operability of the Shoreham diesels. If, however, the County contends that deficiencies in the diesels exist as a result of these findings, produce reports, memoranda and calculations on which Suffolk County relies in support of its allegations.

134. Suffolk County does not claim that the alleged deficiencies in the Energy Consultants, Inc. Report have not been corrected. If, however, the County does claim that any deficiency has not been corrected, produce records, memoranda and calculations on which it relies to support its allegation. Also, produce records, memoranda and calculations that indicate that the alleged deficiency affects the reliability or operability of the diesels.

Paragraph IV.D of Contention IV

135. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.D.1 of Contention IV that the replacement cylinder heads installed in the Shoreham diesel generators "were not designed and manufactured in accordance with an effective Appendix B QA program."

136. Reports, memoranda and calculations upon which Suffolk County relies in support of its allegation in paragraph IV.D.2 of contention IV and in any way evidencing:

(a) the defects in the Appendix B QA program under which the replacement crankshafts were designed and manufactured;

(b) any deficiencies in the qualifications of the subcontractor who manufactured the replacement crankshafts or in its quality assurance requirements and program; and

(c) any effect the alleged deficiencies have on the ability of the replacement crankshafts to perform their intended function.

Miscellaneous

137. Reports, memoranda and calculations that contain or include any criticism, analysis or comment concerning the following reports or memoranda:

(a) FaAA report dated October 31, 1984 on the 13" X 11" crankshaft failure;

(b) FaAA report dated October 31, 1983 on the adequacy of 13" X 12" crankshaft;

(c) FaAA preliminary report dated October 31, 1983 on the connecting rod bearings;

(d) Stone & Webster report [redacted] crankshaft tests;

(e) TDI Report dated Febr[redacted], Analyses of Base Plate [redacted]

(f) Delaval Field Torsiograph Test dated October 5, 1983;

(g) FaAA Preliminary Metallurgical Evaluation of Failed Crankshaft from DG 102;

(h) Woodward Governor Failure Analysis Report dated October 28, 1983;

(i) Final Report on Diesel Engine Head Casting (C. R. Isleib) dated October 6, 1983;

(j) Parsons Peebles Electric Products, Generator Failure Analysis Report (EF-3060) dated October 11, 1983;

(k) November 25, 1983 memorandum from L. A. Swanger/M. F. Wacheb (FaAA) to M. H. Milligan re: Failure Analysis of Fractured Cylinder Head Nut;

(l) Report on Analysis of Lubricating Oil for Emergency Diesel Generator dated November 1, 1983;

(m) FaAA Metallurgical Analysis of Cracked Piston Skirts dated December 8, 1983;

(n) December 7, 1983 letter from C. H. Wells (FaAA) to M. H. Milligan/W. M. Judge re: Integrity of EDG Engine Bases;

(o) Emergency Diesel Generator Test Program dated December 14, 1983;

(p) FaAA Final Report on connecting rod bearings dated December 15, 1983;

(q) December 15, 1983 memorandum from Donald O. Cox (FaAA) to M. H. Milligan re: inspection of jacket water pumps from TDI diesel engines;

(r) SWEC Field Test on Emergency Diesel 101;

(s) Shoreham Diesel Recovery Program Summary and Appendices dated January 6, 1984;

(t) the Diesel Generator Operational Review Report (July 1983);

(u) the Seaworthy Report;

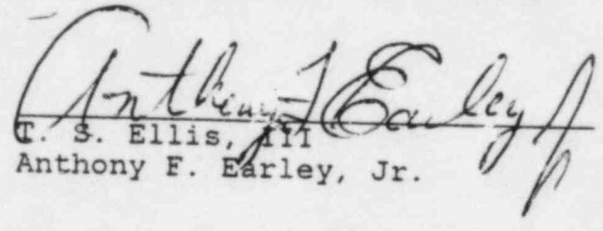
(v) the Sharp Report; and

(w) the Falcon Report.

A separate response to each subpart is requested.

Respectfully submitted,

LONG ISLAND LIGHTING COMPANY



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DATED: February 17, 1984

LILCO, February 17, 1984

CERTIFICATE OF SERVICE

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

I hereby certify that copies of LILCO's Request for Production of Documents were mailed this date to the following by first-class mail, postage prepaid, or were served by hand, as indicated by an asterisk:

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