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~~RELATED CORRESPONDENCE~~

LILCO, March 8, 1985

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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)	)	

PROFFERED TESTIMONY OF PAUL, R. JOHNSTON

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PDR ADOCK 05000322  
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1. Please state your name, business affiliation and address.

A. My name is Dr. Paul R. Johnston. I am employed by Failure Analysis Associates, 2225 East Bayshore Road, Palo Alto, California 94303.

2. Have you previously testified in this proceeding?

A. Yes. My resume and professional qualifications have been previously submitted in this proceeding.

3. Dr. Johnston, are the measured stresses in the Shoreham replacement crankshafts linear in their progression from 2800 KW to 3800 KW?

A. Yes. The stresses in the crankshaft increase linearly with increase in load. The stresses in the crankshaft have been determined from the dynamic strain gauge test of EDG 103 in January 1984 at loads of 1750, 2700, 2800, 3500, and 3800 KW. Results of this test are shown in LILCO Exhibit C-16 previously admitted in this proceeding. Specifically, the relationship between load and stress or strain is shown in Figures B-1 through B-6 of this exhibit. These figures show a linear increase of stress with load. Generally, if the load changes by a given percentage, it can be seen that the stress or strain changes by a slightly smaller percentage.

4. Dr. Johnston, in response to several of Mr. Dynner's questions on cross-examination, Dr. Bush indicated that one of the stresses measured upon the Shoreham replacement crankshaft was tensile stress, which Dr. Bush indicated was measured at 29,800 psi (in a Stone & Webster report) and was not utilized in his analysis. Do you agree with this?

A. No. The strain gauge measurements on the EDG 103 crankshaft capture the effect of all stresses on the crankshaft. These stresses include torsional, bending, and tensile stresses (I prefer to refer to the tensile stresses as axial stresses). The strain gauge measurements were reduced to alternating and mean stresses by Failure Analysis Associates in LILCO Exhibit C-17 at page 3-9 (FaAA-84-3-16 referred to by Dr. Bush), previously admitted in this proceeding. Dr. Bush testified that it was these stresses that were used in his fatigue analysis.

The stress values quoted by Dr. Bush in response to a question from Judge Ferguson were taken from LILCO Exhibit C-16, page B-5 (the Stone & Webster report referred to by Dr. Bush). The major principal stress of 29,800 psi referred to by Dr. Bush is not an axial stress but simply a combination of the bending and shear stresses. The stresses that Dr. Bush quoted are simply different representations of the same stress state.

This stress state is the one used by Failure Analysis Associates in LILCO Exhibit C-17 and thus is the stress state used by Dr. Bush. Simply put, this means that Dr. Bush did not ignore any stresses and actually used the appropriate stresses in his fatigue analysis.

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 the Proffered Testimony of Paul R. Johnston were served this date upon the following by first-class mail, postage prepaid, or by hand, as indicated by asterisk:

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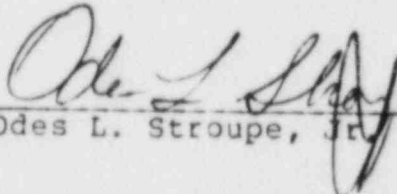
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