50-322 OL

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LILCO, August 14, 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)	)	

CRANKSHAFT EXHIBITS

TESTIMONY OF ROGERT L. McCARTHY, PAUL R. JOHNSTON, EUGENE MONTGOMERY AND SIMON K. CHEN

AND

TESTIMONY OF EDWARD YOUNGLING AND FRANZ PISCHINGER

AND

TESTIMONY OF CLIFFORD WELLS, DUANE JOHNSON, HARRY WACHOB, CRAIG SEAMAN, DOMINIC CIMINO AND N. K. BURRELL

VOLUME I

Exhibits 1 - 15

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CRANKSHAFT EXHIBITS

C-1 Evaluation of Emergency Diesel Generator Crankshafts at Shoreham and Grand Gulf Nuclear Power Stations prepared for TDI Diesel Generator Owners Group dated May 22, 1984 (hereinafter "Owners Group Crankshaft Report"), Figure 3-4.

C-2 Specification for Diesel Generator Sets, Shoreham Nuclear Power Station - Unit 1, Spec. No. SH1-89, Revision 2, January 26, 1983, page 1-20.

C-3 U.S. Nuclear Regulatory Commission Regulatory Guide 1.9, Revision 2, December 1979.

C-4 IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations, Std 387-1977.

C-5 Transcript of July 11, 1984 meeting of the TDI Diesel Generator Owners Group, pages 124-25.

C-6 Available Logged Hours of Operation of DSR-48, Rated 3500 KW @ 450 RPM.

C-7 TDI Diesel Generator Run History - Shoreham Nuclear Power Sation - Unit 1 - August 6, 1984.

C-8 Results of non-destructive examinations of replacement crankshafts at Shoreham after 100 hours of operation at full load or greater.

C-9 American Bureau of Shipping, Rules for Building and Classing Steel Vessels (1983), § 37.17.1.

C-10 American Bureau of Shipping, Rules for Building and Classing Steel Vessels (1983), Table 34.3.

C-11 TDI Crankshaft Drawing Number 03-310-05-AC.

C-12 American Bureau of Shipping Reports on Castings or Forgings of Replacement Crankshafts.

C-13 American Bureau of Shipping letter to TDI dated May 3, 1984.

C-14 Diesel Engine Manufacturers Association Standard Practices for Low and Medium Speed Stationary Diesel and Gas Engines (1972 ed.), pages 53-56.

C-15 TDI Proposed Torsional and Lateral Critical Speed Analysis, August 22, 1983.

C-16 Field Test of Emergency Diesel Generator 103 with 13 x 12 Crankshaft, April, 1984.

C-17 Owners Group Crankshaft Report.

C-18 Crankshaft Torsional Stress Calculations for 8L 17 x 21 Engine-Generator Set, July 19, 1984.

C-19 Table 2.2 from Owners Group Crankshaft Report showing natural frequencies from TDI analysis.

C-20 Table 2.4 from Owners Group Crankshaft Report showing single order nominal stresses from TDI analysis.

C-21 Table 2.5 from Owners Group Crankshaft Report showing nominal stresses calculated from torsiograph.

C-22 Crankshaft Torsional Stress Calculations for 8L 17 x 21 Engine-Generator Set, July 19, 1984, page 11.

C-23 Figure 3-3 from Owners Group Report showing comparison of measured and calculated torque.

C-24 Tables 3.6 and 3.7 from Owners Group Crankshaft Report showing comparison between analytical and test results.

C-25 Figure 3-13 from Owners Group Crankshaft Report showing fatigue endurance limit of replacement crankshafts on Goodman diagram.

C-26 Oberg and Jones, Machinery's Handbook (18th Ed.) pages 352-53; Shigley, Mechanical Engineering Design (McGraw-Hill) pages 212-13; Rothbart (editor), Mechanical Design and Systems Handbook (McGraw-Hill) page 18-4.

C-27 Engineering and Design Coordination Report No. F-46109G.

C-28 Military Specification No. 13165B, Amendment 2, June 25, 1979.

C-29 LILCO Operational Quality Assurance Reports (EDG 102 and 103 Crankshafts).

C-30 Metal Improvement Company Certificate of Shot Peening (EDG 102 and 103 Crankshafts).

C-31 Certificate of Non-Destructive Testing Issued by Krupp Stahl AG (EDG 102 and 103 Crankshafts).

C-32 LILCO Magnetic Particle Testing and Liquid Penetrant Testing Records (EDG 102 and 103 Crankshafts).

C-33 LILCO Ultra Sonic Testing Records (EDG 102 and 103 Crankshafts).

C-34 H. Fuchs and R. Stevens, Metal Fatigue in Engineering (1980) at pages 226-227; H. Uhlig, Corrosion and Corrosion Control at pages 132-133.

C-35 Metal Improvement Company Certificate of Shot Peening (EDG 101 Crankshaft).

C-36 LILCO Operational Quality Assurance Reports (EDG 101 Crankshaft).

C-37 Certificates of Non-Destructive Testing Issued by Krupp Stahl AG (EDG 101 Crankshaft).

C-38 LILCO Magnetic Particle Testing, Liquid Penetrant Testing and Ultra Sonic Testing Records (EDG 101 Crankshaft).

C-39 Kirk, Behavior of Peen-Formed Steel Strip on Isochronal Annealing, Proceedings of the Second International Conference on Shot Peening at page 231, (May, 1984).

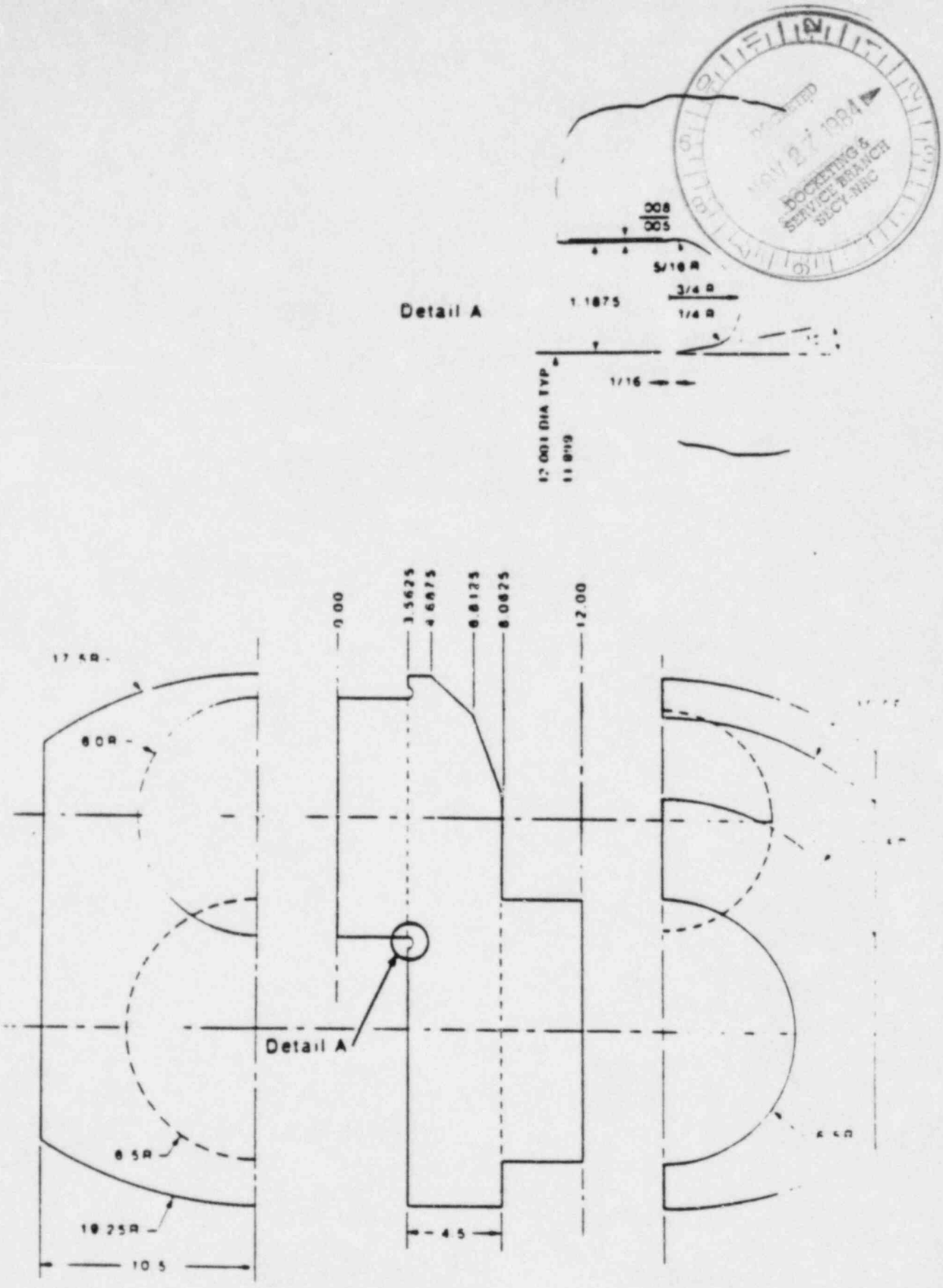

Figure 3-4. Typical structural dimensions of the crankshaft.