

50-322 OL

I-SC 10
I-SC-24
I-SC-43

SUFFOLK COUNTY, 7/31/84

I-SC-48

I-SC-51

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



Before the Atomic Safety and Licensing Board

10/1/84

In the Matter of

LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Plant,
Unit 1).

Docket No. 50-322-OL

SUFFOLK COUNTY'S EXHIBITS TO JOINT DIRECT TESTIMONY

~~CURRICULA VITAE~~

CRANKSHAFT EXHIBITS
10, 24, 43, 48, 51-53
VOLUME 3

NUCLEAR REGULATORY COMMISSION

Docket No. 50-322 Official Exh. No. 10, 24, 43, 48, 51, 53

In the matter of LILCO

Staff _____ IDENTIFIED ☒

Applicant _____ RECEIVED ☒

Intervenor ☒ _____ REJECTED

Cont'g Off'r _____

Contractor _____ DATE 10-1-84

Other COUNTY'S _____ Witness _____

Reporter WRRB

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PDR ADCK 05000322
PDR

Before the Atomic Safety and Licensing Board

Docket No. 50-322-OL

VOLUME 3
SHOTPEENING EXHIBITS
10, 24, 43, 48, 51-53

10. Deposition of Gerald Edgar Trussell, pgs. 62, 45-48, 107, 111-113
24. Deposition of Maurice H. Lowery, pgs. 1, 15-16, 62
43. Deposition of Woytowich, Blanding, and Giuffra (ABS) pgs. 1, 80-81, 93, 98-99, 112, 163-165, 167-168, and Exhibit 3 to the Deposition
48. Letter from Kobe Steel, Inc. to Greg Beshouri Concerning Crankshafts with Fillet Cold Rolling
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BEFORE THE ATOMIC SAFETY AND AND LICENSING BOARD

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In the matter of)
 LONG ISLAND LIGHTING COMPANY,)

(Shorenham Nuclear Power)
 Station, Unit 1))

DOCKET NO. 50-332-OL

DEPOSITION OF GERALD EDGAR RUSSELL

MAY 7, 1984

VOLUME II, Afternoon Session

REPORTED BY:
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COMPUTERIZED
 TRANSCRIPT

1 A. Yes.

2 Q. And what is that name?

3 A. Shot peening.

4 Q. Did Delaval recommend that the replacement
5 crank shaft be shot peened?

6 A. No.

7 Q. Did Delaval recommend that the replacement
8 crank shaft not be shot peened?

9 A. I don't recall.

10 Q. Who was responsible in your organization for
11 supplying the replacement crank shaft to LILCO?

12 A. Supply -- can you give me the question one more
13 time?

14 Q. Who was responsible in your organization for
15 the supplying of the replacement crank shaft for LILCO?
16 And it may be more than one person. I am asking who.

17 A. As to the supplies, the parts manager.

18 Q. Yes. Who was responsible for giving the
19 recommendation as to whether or not the replacement crank
20 shaft should be shot peened?

21 A. I was.

22 Q. And do you now recall what your recommendation
23 was in that regard?

24 A. My recollection is that I recommended against
25 shot peening.

26 Q. Why did you recommend against shot peening?

27 A. The detailed drawing for that part did not call
28 for shot peening.

1 Q. Who prepared the detailed drawing for that part?

2 A. I don't know.

3 Q. Was it Delaval who supplied the detailed
4 drawing for that part?

5 A. Yes.

6 Q. Was there any discussion within the Delaval
7 organization concerning whether or not the detailed
8 drawing should or should not provide for shot peening of
9 the replacement crank shaft?

10 A. Yes.

11 Q. What was the basis for the conclusion that it
12 should not contain the requirements for shot peening?

13 A. The basis for that conclusion lay in an opinion
14 that mechanical improvement by shot peening did not
15 substantially improve the fatigue strength of the crank
16 shaft.

17 Q. Did it improve the strength of the crank shaft
18 at all?

19 A. Yes.

20 Q. Are there disadvantages to shot peening the
21 crank shaft?

22 MR. SMITH: You are talking about the specific
23 shaft in question here, I assume?

24 MR. DYNNER: Yes, right.

25 THE WITNESS: No.

26 MR. DYNNER: Q. So as I understand your
27 testimony -- please correct me if I'm wrong -- there are
28 no disadvantages to the shot peening in this crank shaft,

1 there was an advantage in that it somewhat increased the
2 strength of the crank shaft, and yet you recommended
3 against shot peening; is that correct?

4 A. That's correct.

5 Q. On what was that recommendation based?

6 MS. TARLETZ: Asked and answered.

7 MR. SMITH: I will join in that objection.

8 MR. DYNNER: Q. Aside from the fact that the
9 detailed drawings did not call for the shot peening.

10 MR. SMITH: The question has been asked and
11 answered.

12 MR. DYNNER: I don't think so.

13 THE WITNESS: What is the question?

14 MR. DYNNER: Q. The question is: On what was
15 your recommendation against shot peening based aside from
16 your prior testimony that -- when I asked the question
17 previously -- that it was based upon the fact that the
18 design drawings did not call for shot peening?

19 MR. SMITH: Well, note my objection to the form
20 because I don't think that was -- I think the record will
21 show that that was not the only basis against the
22 recommendation that the witness has already testified to.

23 THE WITNESS: The recommendation against shot
24 peening was based in part on, A, the experience that shot
25 peening did not provide a substantial improvement in the
26 fatigue strength of the shaft, and in part on a
27 discussion with, I believe it was, Professor Wallace.

28 Q. Well, what did Professor Wallace have to say

1 about the shot peening?

2 A. I'm going to have to paraphrase the thing, but
3 I believe Jack indicated to us that the shot peening
4 technique is section sensitive and since we were involved
5 here with a heavy section, the improvement would not be
6 substantial.

7 Q. What does "section sensitive" mean?

8 A. I would like to give an example that would
9 provide a comparison.

10 Shot peening a thin piece of steel of the same
11 specifications of the crank shaft would substantially
12 improve its fatigue strength while applying the same
13 surface improvement technique to a thick section, like a
14 crank shaft, would not provide a substantial improvement
15 in the fatigue strength of the piece.

16 MS. TARLETZ: Could I have that answer read
17 back, please.

18 (Question and answer read.)

19 MS. TARLETZ: Thank you.

20 MR. DYNNER: Q. Mr. Trussell, what do you mean
21 by a substantial improvement?

22 A. Something more than five percent.

23 Q. Did anyone disagree with your recommendation
24 against shot peening the replacement crank shaft?

25 A. Are you asking for a specific name?

26 Q. Anyone.

27 A. Someone did.

28 Q. Who?

1 Q. Overheating means where the temperature exceeds
2 that which is normal for operation at that power level.

3 A. I don't know.

4 Q. With respect to the AE piston, what is the
5 Delaval design figure for the side load on the piston
6 skirt?

7 A. I don't remember.

8 Q. Do you know approximately?

9 A. No.

10 Q. Is that number documented anywhere?

11 A. I believe it is.

12 Q. Where?

13 A. Design department.

14 Q. By design department, you mean the design group
15 in the engineering department?

16 A. Yes, I do.

17 Q. Is that one of the design parameters for the AE
18 piston?

19 A. I don't know.

20 Q. Who do you think would know the answer to that
21 question, Mr. Trussell?

22 A. Mr. Lowry might know.

23 Q. Did Delaval test the AE piston before supplying
24 it to customers in the field?

25 A. No.

26 Q. To what customers did Delaval supply the AE
27 model piston?

28 A. Kodiak Electric Corporation. LILCO. I believe

1 say it in his own words -- my understanding is that the
2 witness, Mr. Trussell, will not be available for
3 deposition past 5:30; is that correct?

4 MR. SMITH: That's correct.

5 MR. DYNNER: I have asked that the witness be
6 available to go on this evening and that request is
7 denied; is that correct, Mr. Smith?

8 MR. SMITH: Well, I wish you wouldn't put it in
9 question and answer form, but you are accurate.

10 MR. DYNNER: All right. And I further
11 requested that since we started late, that is, 10:00
12 o'clock rather than 9:30, we go at least for another half
13 hour until 6:00 o'clock and, that was denied.

14 MR. SMITH: I think it is one statement. I am
15 not willing to go past 5:30 tonight. The record will
16 show we began at ten o'clock this morning.

17 MR. DYNNER: Thank you.

18 Q. Trussell, does Delaval have a expected life for
19 the AE piston?

20 A. No.

21 Q. Do you know what the expected life of a
22 component of a diesel engine means?

23 A. Yes.

24 Q. Have you established expected life for any
25 other components in the R4 series engine?

26 A. We have some.

27 Q. What does expected life mean?

28 A. In my opinion that is -- the expected life of

1 the component is that life that component gives before it
2 has to be replaced.

3 Q. And as far as you know, that is Delaval's use
4 of that term also; is that correct?

5 A. Yes, I believe so.

6 Q. What components does Delaval have an expected
7 life for in the R4 engine?

8 A. I don't know that I can name them all. To give
9 some examples, I believe we have expected life on valves,
10 piston rings, bearings, fuel injection nozzle tips,
11 possibly cylinder liners.

12 Q. Is there an expected life for cylinder heads in
13 the R4 engine?

14 A. To the best of my knowledge, no.

15 Q. Well, you have not established an expected life?
16 Does that mean that the component is expected to last for
17 the full life of the engine itself?

18 A. Yes.

19 Q. Is there an expected life for the cylinder
20 block of the R4 engine?

21 A. No.

22 Q. Is there an expected life for the engine base
23 of the R4 engine?

24 A. No.

25 Q. Is there an expected life for the replacement
26 crankshaft model for the DSR 48 engine?

27 A. No.

28 Q. What is the expected life of the DSR 48 engines

8

1 at Shoreham?

2 A. 40 years, I believe.

3 Q. Does that 40 years postulate any level of
4 operation per year?

5 A. I don't know.

6 Q. Is the life of the engine expected to be the
7 same whether it operates not at all or operates
8 continuously for 40 years?

9 A. Say that again, please?

10 Q. I said, does it make any difference in the
11 expected life of the engine whether it doesn't operate at
12 all during 40 years or whether it operates continuously
13 for 40 years?

14 A. Yes.

15 Q. Does Delaval have some standard expectations
16 for the life of the engine at all aside from the 40 years,
17 that is to say, in terms of its operation during those 40
18 years?

19 MR. SMITH: I don't think I understand your
20 question. I object to the form of question. See if you
21 can rephrase it. I am not objecting to your inquiry into
22 this line, but see if you can rephrase the question.

23 MR. DYNNER: All right, I can see.

24 MR. SMITH: The objection is it's
25 incomprehensible.

26 MR. DYNNER: To Counsel.

27 MR. SMITH: At least at a minimum.

28 MR. DYNNER: We haven't heard from the witness