

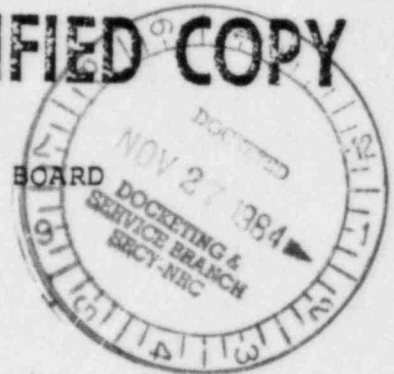
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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of)
LONG ISLAND LIGHTING COMPANY)
(Shoreham Nuclear Power Station)
Unit 1))
_____)

Docket No. 50-322-OL



DEPOSITION OF PAUL R. JOHNSTON

May 9, 1984

VOLUME I - Afternoon Session

Reported by:

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1 increase linearly toward the exterior of the shaft. In fact,
2 the shear stress on a shaft is Tau, Greek letter, is equal
3 to the torque amount of twist applied to the shaft times the
4 distance from the center of the shaft divided by the polar
5 moment of inertia.

6 Q Is this in your report?

7 A Yes, it is.

8 Q Can fatigue cracks occur below the surface?

9 A It is possible that they can, yes.

10 Q Under what circumstances can fatigue cracks occur
11 below the surface?

12 A Fatigue cracks might form below the surface if the
13 stress is higher there or if the material is weaker there.

14 Q In a crankshaft that was not shot peened, under what
15 circumstances could the material be weaker below the surface
16 than on the surface?

17 MS. TARLETZ: Object. The question is very, very
18 broad and doesn't give the witness really enough information
19 to even define in a limited set of circumstances.

20 MR. SCHEIDT: Can you answer the question?

21 THE WITNESS: If the, as I just mentioned, the
22 stress would be higher on the surface for a crankshaft,
23 so if a fatigue crack was to initiate below the surface, it
24 would be due to material deficiency.

25 MR. SCHEIDT: Q Porosity, could that --

26 A It could be.

27 Q Are there any detriments to shot peening?

28 MS. TARLETZ: If any.

1 THE WITNESS: Shot peening puts more emphasis on the
2 material quality below the surface because of the fact that
3 it imposes a compressive stress region on the surface, those,
4 it may change the area of interest, but to the extent that
5 that is detrimental, it is detrimental. Typically it is not
6 detrimental.

7 MR. SCHEIDT: Q What do you mean by change the area
8 of interest?

9 A Well, as I mentioned earlier, without shot peening
10 on a shaft, one would expect a fatigue crack to initiate from
11 the surface.

12 As you asked earlier, could a fatigue crack initiate
13 below the surface and I mentioned that, yes, it could if there
14 was a material deficiency.

15 If now you come and you shot peen the surface, you
16 reduce the likelihood of a fatigue crack initiating on the
17 surface but do not necessarily change the likelihood of
18 defect initiating at, another defect.

19 The conclusion is that shot peening reduces the chance
20 of initiating a crack at the location that it would most
21 likely initiate were it not shot peened.

22 Q Are there any detriments to shot peening?

23 MS. TARLETZ: Objection. I believe the witness has
24 already answered. If you want to define detriment a little
25 bit more carefully perhaps he could continue. But I believe
26 he already answered the question.

27 MR. SCHEIDT: Have you completely answered the ques-
28 tion?