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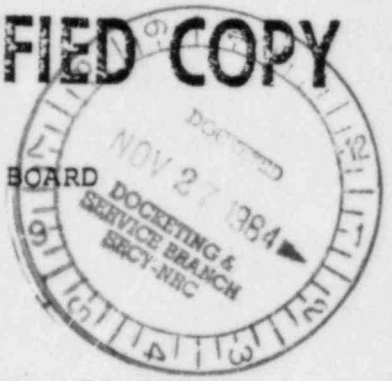

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

DEPOSITION OF PAUL R. JOHNSTON

May 9, 1984

VOLUME I - Afternoon Session

Reported by:

KEMBLE ANTZ, CSR 669

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

Q. Is this in your report?

A. Yes, it is.

Q. Can fatigue cracks occur below the surface?

A. It is possible that they can, yes.

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

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

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

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

MR. SCHEIDT: Can you answer the question?

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

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

A. It could be.

Q. Are there any detriments to shot peening?

MS. TARLETZ: If any.

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

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

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

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

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

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

Q. Are there any detriments to shot peening?

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

MR. SCHEIDT: Have you completely answered the question?