LILCO, August 17, 1983

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)	)	

LILCO'S MOTION FOR A PROTECTIVE ORDER IN RESPONSE TO SUFFOLK COUNTY'S RENEWAL OF ITS MOTION TO COMPEL

On August 12, 1983, Suffolk County renewed its motion to compel discovery of certain documents that the County claims are relevant to the issue of cylinder head cracking. In general, LILCO objects to the request because:

(1) the requests are beyond the scope of the contention,

(2) the requests are excessively broad especially given the extensive discovery that the County has had to date on this issue, and

(3) the requests are excessively burdensome given the ample opportunity the County has had to explore during depositions the availability of specific documentation.

As this response reflects, LILCO objects to most of the County's requests, but will nonetheless produce some of the documents sought by SC. A response to each request is set out below. LILCO's agreement to produce documents in response to

objectionable requests is not a waiver of its right to object to further document requests of a similar nature or to object to testimony based on the documents produced.

A. Quality Assurance Documents (Items 1, 2, 3 and 5)

Suffolk County's document requests in the area of quality assurance reflect a desire on the part of the County to renew the already comprehensive quality assurance litigation in this proceeding. The County attempts to legitimize its requests by claiming that it merely wants to ascertain the reliability of the cylinder heads on the Shoreham diesels by reviewing the quality assurance measures applied to them. The transparency of the County's argument, however, is revealed by comparing the broad range of documents requested to the issues admitted by the Board.

The Board explicitly recognized that a general contention concerning quality assurance matters at Delaval was inappropriate at this stage of the proceeding. In ruling on the admissibility of the diesel generator contention originally proposed by the County, the Board stated:

> [W]e find that the first two unnumbered paragraphs comprise a broad, nonspecific preamble alleging generally that LILCO violates broad General Design Criteria applicable to diesel generators and broad Quality Assurance criteria . . . .

> This is particularly impermissible at this stage.

Board Memorandum and Order dated June 22, 1983, at 17. And in discussing the portion of the County's contention dealing with preoperational testing, the Board said:

> To the extent any part of paragraph 1 may be construed not as a new contention concerned with the reliability of the diesels, but rather as a request to re-open and continue the QA/QC litigation, it is rejected.

Id. at 24. Finally, in succinctly stating the issues in this litigation following LILCO's unsuccessful motion for summary disposition, the Board made no mention of a general inquiry into quality assurance matters. According to the Board, the issues are whether:

1. Based on either analysis or operating experience, or both, the new Delaval production techniques have solved the problems which caused the cracking of the original type cylinder heads.

2. The "barring-over" surveillance procedure for up to twelve hours after shutdown of the diesels will identify any cracks then existing in the cylinder heads (due to symptomatic water leakage).

3. The nature of the cracking problem and stresses exacerbating the cracks are such that no new cracks will be formed during cold shutdown of the diesels.

4. Any cracks in the cylinder heads and concomitant water leakage occurring during cold shutdown of the diesels which would not be detected by the barring-over procedure would sufficiently impair rapid start-up and operation of the diesels such that they would not perform their required function.

5. Any cracks in the cylinder heads occurring during operation of the diesels would prevent the diesels from performing their required function.

Rather than focusing on the inspection techniques applied to the new cylinder heads, the County seeks to litigate whether the quality assurance program at Delaval meets the requirements of 10 CFR Part 50 Appendix B. While an Appendix B QA program is in place at Delaval and may have some bearing on the reliability of the cylinder heads, LILCO has not and does not intend to rely on the existence of such program to demonstrate that the new Shoreham cylinder heads are not likely to leak. Rather, LILCO and Delaval personnel have stated both in affidavits and depositions that they rely on particular production processes and inspection techniques to reach their conclusion that the new heads are unlikely to leak.

The distinction between relying on an overall QA program and relying upon specific techniques and inspections is consistent with the scope of the contention as envisioned by

the Board. Drawing such a distinction is appropriate given the history of this proceeding. During the litigation of the quality assurance contentions, the County had ample opportunity to inquire into whether LILCO and its vendors, including Delaval, had developed and implemented quality assurance programs that met the requirements of Appendix B. In discovery on the QA issues, the County had access to LILCO and Stone & Webster audits, including audits relating to contractors and vendors. During the months of QA hearings, the County conducted cross-examination concerning the QA programs of contractors and vendors. See, e.g., Tr. 11,074-76, 11,114-15 (Courter); Tr. 11,086-88 (Comstock-Jackson); Tr. 12,178-89 (Bergen-Patterson); Tr. 12,147-59 (Stone & Webster PQC). Thus, general inquiry into Delaval's QA program could have been pursued prior to the close of the record in this proceeding and should not be permitted now.

The prior opportunity to litigate compliance with Appendix B does not, however, preclude all inquiry into quality assurance/quality control matters. Those aspects of quality control narrowly focused on the inspection techniques upon which LILCO and Delaval rely in establishing that there is reasonable assurance that the new cylinder heads will not leak are relevant to the contention and appropriate subjects for

discovery. Indeed, the County has made numerous discovery requests related to these specific quality control measures applied to the new diesel generator cylinder heads. LILCO and Delaval have responded to these requests providing copies of, among other things, the hydrostatic test procedure and magnetic particle test procedure for the new heads.1/ The County, however, continues to press for documents well beyond those that have any direct bearing on whether the new cylinder heads will experience leaks similar to those encountered on the old Shoreham heads. Therefore, the requests are excessively broad.

Notwithstanding LILCO's objection, in an effort to resolve the issue LILCO and Delaval will provide the County with the following documents in response to Item 1 of Attachment A to the motion to compel:

1. Delaval QA Manual
2. Delaval Foundry QA Manual
3. Delaval ASME QA Manual
4. I.P. 100, I.P. 200, I.P. 400, and I.P. 600.

1/ Item 5 of the County's request, the liquid penetrant procedure, deals with a specific test performed on the new heads. LILCO does not object to this request and will provide a copy to the County. If this document was previously requested, its non-production was merely an oversight.

It should be noted that during informal discovery on July 13-14, the County reviewed the Delaval QA Manual and I.P. 300, the In-process Inspection Manual. At the County's request, Delaval provided the County with a copy of I.P. 300.

In item 2, the County requests the documents that comprised the Delaval Quality Assurance program in effect when the original Shoreham heads were produced. LILCO objects to this overly broad request because it fails to focus on the quality control inspections specifically relied upon by LILCO and Delaval to ensure that the Shoreham cylinder heads are not likely to leak. Moreover, this item deals with the old cylinder heads which have been replaced with new cylinder heads. Given the County's failure to focus on precise quality control measures and the questionable relevance of the request, it would be unnecessarily burdensome to force Delaval to search its records to ascertain precisely what QA documents were in effect when the old heads were fabricated. The Board should not impose such a burden given the extensive discovery the County has had with respect to the processes applied to the new cylinder heads. As a result, LILCO moves for a protective order precluding the discovery sought in item 2.

With respect to item 3 of Attachment A, LILCO objects to the County's request for records of all inspections, audits

or reaudits of Delaval's QA program. First, as noted above, the County had access to audits conducted by LILCO during quality assurance discovery. Second, LILCO has already provided the County with a copy of the LILCO field audit (FA-1627) which focuses specifically on the quality control inspections relied upon by LILCO to establish that the new cylinder heads are unlikely to leak. Suffolk County also deposed the author of this audit. And third, the older audits requested by the County do not focus on the new cylinder heads and thus the request is overly broad and irrelevant to the question of whether the new heads will experience leaks similar to those found in the old heads. This request reinforces LILCO's view that the County is attempting to broaden the scope of this contention despite the Board's rulings which keep it narrowly focused. Accordingly, LILCO moves that the Board issue a protective order precluding production of those documents covered by item 3 of the County's motion to compel.

B. Gating, Risers and Chills (Item 4)

Item 4 of the County's motion requests documents "showing the gating, risers and chills for the 'old style' cylinder head molds and for the 'new style' head molds." As the County has been told both informally and in depositions, there are no drawings which show the location of gates, risers and

chills for the old or new cylinder heads, nor are such drawings required by a regulation or industry practice. As the depositions reflect, it is industry practice to design molds from the design drawings for the casting. These design drawings for both the old and new heads have been made available to the County.

The County's request for these documents is particularly inappropriate given the number of discovery opportunities the County has had on this subject. During informal discovery meetings conducted on July 13-14, the County's consultants were provided with lists of the changes made over the years to the production process for the cylinder heads. These lists included changes to gating, risers and chills. The County consultants were also given access to Delaval personnel familiar with these changes and were given a tour of the Delaval foundry where the actual molds in use could be observed. Later, during the week of August 1, the County was provided with a consolidated list of over 60 changes identified in the lists previously given to the County on July 13-14. In addition, the County selected, and LILCO and Delaval made available for depositions, two witnesses knowledgeable in the Delaval casting process and the changes made to it over the years. Pertinent parts of the depositions are Attachments 1 and 2 of this motion. The

excerpts clearly indicate that the County had the opportunity to pursue these matters and chose to do so in a limited fashion. The County's failure to avail itself of these extensive discovery opportunities justifies the issuance of a protective order precluding further discovery on changes in the casting process. If, however, the Board concludes further discovery is warranted, Delaval will make available for inspection at its Oakland facility the actual molds used in the production of the old and new heads.

C. Documentation Regarding Casting Defects (Item 6)

The documentation already supplied to Suffolk County by LILCO and Delaval comprises all of the documentation responsive to the County's request relating to casting defects. In a telephone call subsequent to the filing of this motion, County counsel noted that the documentation did not appear to include "warranty claims." Delaval has informed LILCO that "warranty claims" were reviewed in response to prior requests and no responsive documents were found.

With respect to the County's request for "documents which disclose the number of cylinder heads manufactured by Delaval between late 1978 and September 1980," counsel for LILCO informed counsel for SC that from June 1978 through the

present, Delaval has produced approximately 2071 new cylinder heads. In addition, Delaval will provide the daily foundry reports for the period of July 1978 through September 1980. These reports will list all heads cast during that time period.

Summary

LILCO has or will provide documents responsive to items 1, 4, 5 and 6 of Attachment A to the County's motion to compel. Some of these documents are produced over LILCO's objection and LILCO reserves the right to object to further similar discovery requests or to testimony concerning general QA matters. LILCO asks that the Board issue a protective order with respect to items 2, 3 and 5 of Attachment A precluding further discovery on these matters.

Respectfully submitted,

LONG ISLAND LIGHTING COMPANY

Anthony F Earley Jr/DCF

T. S. Ellis, III
Anthony F. Earley, Jr.

Hunton & Williams
Post Office Box 1535
Richmond, Virginia 23212

DATED: August 17, 1983

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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.) No. 50-322 O.C.

Deposition of
EDWARD S. DOBREC

August 3, 1983

Reported by: ADELE I. NOLAN, CSR No. 1641,
LESLIE TANIMURA-WONG, CSR No. 5796

I N D E X

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E X H I B I T S*

Exhibit No.:

1	Seven-page Foundry Practice Procedure document	49

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*Exhibit bound separately.

BE IT REMEMBERED that, pursuant to Notice of Taking Deposition, and on Wednesday, the 3rd day of August, 1983, commencing at the hour of 3:00 p.m. thereof, at the offices of TRANSAMERICA DELAVAL, INC., ENGINE AND COMPRESSOR DIVISION, 550 85th Avenue, P. O. Box 2161, Oakland, California, before me, ADELE I. NOLAN, a Notary Public in and for the City and County of San Francisco, State of California, there personally appeared

EDWARD S. DOBREC,

called as a witness, who, having been duly sworn, was examined and testified as hereinafter set forth.

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KIRKPATRICK, LOCKHART, HILL, CHRISTOPHER & PHILLIPS, 1900 M Street, N. W., Washington, D. C. 20036, represented by ALAN ROY DYNNER, Attorney at Law, and MICHAEL S. MILLER, Attorney at Law, appeared as counsel on behalf of Suffolk County.

HUNTON & WILLIAMS, 707 East Main Street, Richmond, Virginia 23212, represented by T. S. Ellis, III, Attorney at Law, and ANTHONY F. EARLEY, Attorney at Law, appeared as counsel on behalf of Long Island Lighting Company.

ORRICK, HERRINGTON & SUTCLIFFE, A Professional Corporation, 600 Montgomery Street, San Francisco, California 94111, represented by VICTORIA GRUVER, Attorney at Law, appeared as counsel on behalf of Transamerica Delaval, Inc.

ALSO PRESENT: Richard A. Pratt, Transamerica Delaval, Inc., John C. Kammeyer, Assistant Head, Site Engineering Office, Stone &Webster Engineering Corporation,

Shoreham Nuclear Power Plant, Wading River, New York.

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EXAMINATION BY MR. MILLER

MR. MILLER: Q. Mr. Dobrec, my name is Mike Miller.

With me today is Alan Dynner. We represent Suffolk County in the licensing proceeding involving the Shoreham Nuclear Power Plant, Suffolk County, New York.

The plant, as you know, I think, when built, is being constructed by Long Island Lighting Company.

We are here today to take your deposition for discovery purposes in this proceeding.

Q. Would you please state your name and address, please?

A. Edward S. Dobrec.

Is the initial satisfactory?

Q. Yes, sir.

And your address?

A. Home address or business?

Q. Business address is fine.

A. 550 85th Avenue, Oakland, California.

MR. MILLER: Can we go off the record for a minute?

[Discussion off the record.]

MR. MILLER: Back on the record.

Q. Mr. Dobrec, can you please state your position at Delaval?

A. Foundry Manager.

Q. And for how long have you been Foundry Manager?

THE WITNESS: I wouldn't swear for sure if I saw this one or not.

MR. MILLER: Q. Mr. Dobrec, perhaps you could turn to the next to the last page of the audit report, which is identified as FA dash 167, and this is the last two pages are a letter or a memorandum from Mr. Zeuthen to Mr. Milligan of LILCO.

You will note in the next to the last paragraph of the page, it sets forth a number of changes in foundry practice, and they include, according to Mr. Zeuthen, core design, the location of risers, and chills, improved core supports, alignment, sand mix, and core materials.

Do you see that reference, sir?

A. [Examining document.] Yes, that's right.

Q. Would that be, to your understanding, a complete list of changes made with respect to the cylinder heads that have improved the manufacturing casting processes of the cylinder heads?

MR. EARLEY: I object to the question based on the document.

You didn't establish whether he was familiar with the document.

He said he wasn't even sure whether he was familiar with the field audit.

Why don't you ask him whether he was familiar with what Mr. Zeuthen had to say there, and then go on.

MR. MILLER: Mr. Earley, I'm merely asking the witness if he -- I have asked him -- I have referred him to certain

changes in foundry practice listed by Mr. Zeuthen, and I have asked him if he agrees if that is a complete list of changes made with respect to the new cylinder heads that makes those heads more reliable.

MR. EARLEY: We have already confirmed that the list is the list of changes that were made.

MR. MILLER: Let's try it a different way, Mr. Dobrec.

Q. With respect to risers --

A. Yes.

Q. -- have there been changes made in the risering of the cylinder heads?

A. Yes.

Q. Which, in your opinion, improved the reliability of the cylinder heads?

A. Yes.

Q. Can you describe when that change -- what that change was?

A. In order to give the total change, we would have to start right through the list.

Q. Mr. Dobrec -- and again we're going to try to save time here --

A. Yes.

Q. -- what, other than going through this list which has been provided by Mr. Earley, could you just describe -- you have indicated there have been changes in the risering.

Could you briefly describe what the change was?

A. The diameter of the riser has been changed, increased. The height has been increased. The material called

rise-a-therm is used on the center riser, which is a highly exothermic material that actually remelts a certain amount of molten metal that is in a riser.

Exothermic sleeves have been added to keep the molten metal hot for a longer period of time to aid in the feeding of the casting.

Q. Do you know generally when that change or these changes were made?

A. They took place from '79 on through current.

Q. Was the change in the risering made in response to a particular problem or problems that had been experienced or evidenced in the cylinder heads produced by Delaval?

A. They were made to improve and cut down the rework of the steel casting in the cleaning room.

Q. So is it fair to say that the reason for the change was for cast efficiency?

A. Improve the quality of the product and cost.

They run hand in hand.

Q. Yes, sir.

Now with respect to gates, Mr. Dobrec, could you briefly describe for me what changes had been made in the gating of the cylinder heads that, in your opinon, would improve the reliability of their currently produced cylinder heads?

A. Yes. The gating went from a joint gate, which then dropped to the bottom of a riser, and contacted four risers, to cutting down to entering two risers to the final stage, which is a crossover bottom core, which we bottom gate totally

into the risers, which is one of the best foundry standard practices that you can use, used in the industry quite extensively.

Q. Am I correct, Mr. Dobrec, that the gates now come into the mold from the bottom of the mold?

A. The gate is on the underside of the mold pattern - it's still part of the mold.

Q. Yes, sir.

A. And it allows the molten metal to enter the casting from the bottom.

Q. Could you tell me approximately when the changes in the gating were made by Delaval?

A. They are around '80, '81 -- if the exact date is in this list.

Q. Fine, sir.

If you don't remember it, I received the list, and I can find it.

Was the change in the gating, Mr. Dobrec, made with respect, or in response to any particular problem or problems experienced by Delaval in the cylinder heads?

A. The gating was made in response to -- and changes to aid in the elimination of sand discontinuities.

It also, the change in gating, aids in solidification of the parts.

It allows the metal to enter the mold cavity so you can have directional solidification for soundness and in areas where it is possible to eliminate hot tears.

Q. Mr. Dobrec, my question was: Were these changes made

in response to any particular problem or problems, and so is it correct that Delaval was experiencing problems in these areas such as sand discontinuities prior to the change made in gating?

We were experiencing normal foundry defects of sand inclusion, hot tear, which is a foundry defect that transpires to anyone that does cast complex steel castings.

Q. Were these problems that had been experienced by Delaval -- did they result in a higher than acceptable to Delaval reject -- rework rate?

A. They resulted in higher rework than we would like.

The goal was to make them as reasonable and as low-cost quality as possible. That is the job of a foundry man..

Q. So again, is it fair to say that, in part, the changes in gating were in response -- were in order to make more cost efficient the cylinder heads produced by Delaval?

A. I said it was his -- in response to making a better-quality part and reduce the cost of manufacture.

Q. Now would you agree, Mr. Dobrec, that there have been changes in the chills of the cylinder heads which have led to a more reliable product of the cylinder heads?

A. Depending -- the placement of the chills, until they are used at the most efficient point, will aid in making a more reliable --

Q. Yes. I'm asking if Delaval has made changes in the placement of the chills?

A. Yes.

Q. And approximately when were those changes made?

A. Again, they are listed in this list.

I would have to go through it to give you approximate dates.

Q. Rather than do that, Mr. Dobrec, could you tell me if the changes made with respect to placement of chills was in response to a particular problem or problems which had been experienced by Delaval in the manufacture of its cylinder heads?

A. Yes. Chill placed in the wrong area on a steel casting can enhance a hot tear.

It can affect feeding to cause shrinkage by cutting off the feed metal during solidification.

Q. And were these problems which Delaval was experiencing which led to the decision to change the placement of the chills?

A. Yes.

Q. Is it fair to say that, in part, Delaval made the change in placement of chills also to lower cost of the cylinder head?

A. When you lower the cost, you improve the quality, because you do not need rework.

Q. With respect to sand mix, Mr. Dobrec, have there been changes in the sand mix?

A. Yes.

Q. And approximately when were those changes made, if you recall?

A. Those have transpired throughout the whole list of changes.

The major changes took place in the areas of the '79, '80 era on.

Q. And were the changes with respect to sand mix in response to a particular problem or problems which had been experienced by Delaval?

A. They were made because the state of the art had changed.

Equipment was available for new sand mixes that before this time could not be used.

They -- when the new equipment was made, shell sand could be used, which takes special equipment.

These changes were all made also for the cost of manufacture and quality.

Q. Were the changes in sand mix made, in part, in response to particular problems or problems which had been experienced in the manufacture of cylinder heads by Delaval?

A. Yes.

MR. EARLEY: Asked and answered. I think that was the last question he gave you the answer.

MR. MILLER: Q. Now, Mr. Dobrec, with respect to what I will call pattern equipment improvements, have there been changes made in pattern equipment improvements to the cylinder heads?

A. There has been new pattern equipment made for the making of cylinder heads.

Q. Would -- in saying that there has been new patterns, new patterns made, did that include core supports?

A. I'm not sure what you are referring to is a core

support.

It's a terminology that we don't use in this foundry, and I have worked in several others, and I have not heard.

Q. Would it include core design?

A. Okay. What was that second part?

Q. Core design.

A. What about the core design?

MR. EARLEY: What is the question?

MR. MILLER: Q. The question is whether or not the pattern equipment improvements would include change to the core design?

A. Yes. Core design and core equipment, yes.

Q. Would the pattern equipment improvements include the core materials used?

A. Yes, because the type of boxes, the core equipment made different core sands, could now be used.

Q. Would the pattern equipment improvements include the alignment of the cores?

A. Yes.

Q. Now, Mr. Dobrec, with respect to all these pattern equipment improvements, were these the improvements made approximately September of 1980?

A. Yes.

Q. Were these improvements made in response to any particular problem or problems that had been experienced by Delaval in the manufacture of cylinder heads?

A. They were made problems, number one, to the manufacture of the head because of cost, poor equipment that was being --

that was worn, that had been used for several years.

When the new equipment was made, it allowed the foundry to ask engineering to give us some sections to allow better feeding, which would aid us in eliminating problems that we had, yes.

Q. Were those changes in pattern equipment -- pattern equipment improvements at all in response to the goal of lowering the cost?

A. Lower the cost, and a better-quality part.

Q. Mr. Dobrec, with respect to preheating of the heads prior to welding valve seats --

A. And I'm not involved with the stelliting at all.

Q. Where is that done, sir?

A. That is done in the machine shop after machining.

Q. So you would have no knowledge regarding this process of preheating?

A. No.

Q. What about with regard to the stress relief, sir?

A. The stress relief is done in the foundry, yes.

Q. Have there been changes in the stress relief process which, in your opinion, has led to more reliable cylinder heads?

A. Yes.

Q. Approximately when were these changes made, sir?

A. I believe they were around August of '80.

If I'm not mistaken, '79 or '80.

I'm not sure if it is.

Q. That's fine, sir. Okay.

Could you briefly describe what changes were made in the

stress relief process?

A. Okay. The stress relief process, what it involved is the casting has always been heat-treated.

It has always been stress relieved after repairs in the foundry before it left the machine shop -- to the machine shop.

After complete machining and hard facing for a period of time, it was not stress relieved.

In around August, after the water test and final machining, it was brought -- August of about '79 or '80 when stress relieving began, that was the final operation.

It was returned to the foundry to be stress relieved as the final operation.

Q. Were the changes in the stress relieving in response to any particular problem or problems that had been experienced by Delaval in manufacturing the cylinder heads?

A. There I believe we had some cracking of heads from residual stresses, yes.

Q. Now, Mr. Dobrec, with respect to pickling, is that a process which is -- which involves the foundry?

A. No.

Q. Where is that process performed?

A. That process is done in the machine shop.

It is, I believe they send them out.

They do it in-house now -- or beginning.

Q. And if I understand your testimony from a little earlier, Mr. Dobrec, ultrasonic testing would not be performed in the foundry?

A. Foundry, no.

Q. Mr. Dobrec, could you tell me when the Delaval change from number one steel to number seven steel took place in the production of cylinder heads?

A. Let me look through here, and I think I can find it in this list.

[Mr. Platt left the deposition room.]

THE WITNESS: [Examining documents.] Yes.

The number one to number seven was quite a ways back.

That's in the period of 19 -- late 1976.

MR. MILLER: Q. Do you remember who suggested the change be made?

A. I would belive it would be Harold Helgerson, who deals with the metal.

Q. Do you know why the change was made from number one steel to number seven steel?

A. He describes it in number 4, in the list that you have.

The higher manganese, along with the hypercal, h-y-p-e-r-c-a-l, dioxidation practice minimized the deleterious effects of sulfur.

Q. Thank you, sir.

Mr. Dobrec, with respect to inspections of scrap received by the foundry --

A. Yes.

Q. -- have you read and reviewed Mr. Avery's affidavit?

A. Yes.

Q. Then you are familiar, I assume, on page 6 of Mr. Avery's affidavit, he states, quote: "I was told by Ed Dobrec,

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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.) No. 50-322 O.C.

Deposition of
HAROLD A. HELGERSON

August 4, 1983

Reported by LESLIE TANIMURA-WONG, CSR No. 5796,
ADELE I. NOLAN, CSR No. 1641

I N D E X

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BE IT REMEMBERED that, pursuant to Notice of Taking Deposition ard on Thursday, the 4th day of August, 1983, commencing at the hour of 9:10 a.m. thereof, at the offices of TRANSAMERICA DELAVAL, INC., ENGINE AND COMPRESSOR DIVISION, 550 85th Avenue, P. O. Box 2161, Oakland, CA 94621, before me, LESLIE TANIMURA-WONG, a Notary Public in and for the County of Contra Costa, State of California, there personally appeared

HAROLD A. HELGERSON,

called as a witness by Suffolk County, who, being by me first duly sworn, was thereupon examined and testified as hereinafter set forth.

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KIRKPATRICK, LOCKHART, HILL, CHRISTOPHER & PHILLIPS, 1900 M Street, N. W., Washington, D. C. 20036, represented by MICHAEL S. MILLER, Attorney at Law, appeared as counsel on behalf of Suffolk County.

HUNTON & WILLIAMS, 707 East Main Stréet, Richmond, Virginia 23212, represented by ANTHONY F. EARLEY, Attorney at Law, appeared as counsel on behalf of Long Island Lighting Company.

ORRICK, HERRINGTON & SUTCLIFFE, A Professional Corporation, 600 Montgomery Street, San Francisco, California 94111, represented by VICTORIA GRUVER, Attorney at Law, appeared as counsel on behalf of Transamerica Delaval, Inc.

Also present: William B. Avery, John C. Kammeyer, Edward S. Dobrec, Richard A. Pratt.

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A. I have read it, yes.

Q. Do you have a copy with you, sir?

A. Yes, sir. It's right in front of me.

Q. Would you look at page 9, paragraph 11, sir, of Mr. Pratt's affidavit.

Do you see there in the second line of paragraph 11, it states, quote, "In the nine years since LILCO's engines were manufactured, TDI has continued to develop and improve the casting and manufacturing processes employed and produced in the four valve steel cylinder heads, like those originally supplied with the Shoreham cylinders," closed quotes.

Would you agree with that statement made by Mr. Pratt, Mr. Helgerson?

A. Very much so.

Q. Are you familiar with the quote? Are you familiar with the casting and manufacturing processes which Mr. Pratt says has improved the cylinder heads?

A. Very much so.

Q. Were you involved in those improvements to the casting and manufacturing processes?

A. Very much so.

Q. Could you tell me which of those casting processes you were involved with?

MR. EARLEY: Well, could you focus on a particular portion of Mr. Pratt's affidavit?

MR. MILLER: Well, I don't believe, Mr. Earley, Mr. Pratt's affidavit sets forth the changes in the casting

processes.

MR. EARLEY: Are you asking him for a listing of changes?

MR. MILLER: I am asking him for a listing of those changes in the casting processes which he was involved with.

Q. If it would help, I will focus the question, Mr. Helgerson.

A. I think -- weren't they given a list of 68 improvements?

MR. EARLEY: The County has been provided with the list. If we want to refer to the list, I think it would be a lot more efficient than asking him to do it from memory.

THE WITNESS: I have been involved with every one on the list.

Q. Referring to the page entitled -- well, referring to the document which is five pages; the first page is entitled: Valve Steel Head - 03-360-03-OF, which was made an attachment yesterday to Mr. Dobrec's deposition -- I think it's Exhibit 1 of Mr. Dobrec's deposition, Mr. Helgerson, it is your testimony you were involved in each and every change that is specified on these five pages; is that correct?

A. Yes.

Q. Let me try to focus you on some particular changes since this is a long list; okay?

A. Yes, it is.

Q. With respect to changes in the risers for the cylinder heads --

A. Yes, sir.

Q. -- did you have involvement in that change?

A. Yes, I did.

Q. Can you tell me your involvement?

A. I am a foundry engineer. One of my duties or responsibilities is to alter the riser or gating of a mold if it enhances the quality of the final product and that is what these changes were for.

Q. Could you tell me briefly, if possible, what changes with respect to risering was adopted by Delaval?

A. The riserings in some cases are made large to give a larger reservoir of feed metal to the casting, which also eliminates any possibility of microshrinkage or hot tears in the casting.

It is also made higher because a full reservoir would make a bigger volume of molten metal; or there were riser sleeves that were added to the risers to save the metal -- molten metal, but to enhance the feeding characteristics of the risery, per se.

Q. Now, Mr. Helgerson, with respect to chills, what did Delaval do to improve the casting techniques with respect to chills?

A. A chill is used to place in a casting a considerable distance away from a riser to enhance the feeding distance the riser will feed; also, to eliminate any possibility of a hot tear underneath the chill; and a chill can be either heavy sands, such as zircon, olivine, chromite or it can be a metal; usually, iron or a steel.

In our case, we use exclusively steel.

Q. Yes, sir, and my question would be: What changes were made with respect to the chills to improve the casting process?

MR. EARLEY: Are you asking him to go through the list? Do you want him to generally summarize the changes?

MR. MILLER: I think because of the time, I will ask Mr. Helgerson to summarize what changes were made with respect to the chills.

THE WITNESS: We add chills on the fire deck surface originally, but then we remove those and increase the riser and the feeding distance of the pad to eliminate the chills to simplify the molding and the cleaning process.

It also gave a better fire deck surface and improved it considerably. We also took and put chills in the air intake core to eliminate hot tears and excessive cleaning inside the intake core, which is the portion that this Shoreham hot tear was developed.

MR. MILLER: Q. How do you know that is where the hot tear was developed with respect to the Shoreham cylinder head?

A. I am not acquainted with it. I said I hadn't reviewed it. I was told prior to this meeting that there was a hot tear in the cylinder head, according to Mr. Pratt's deposition here -- affidavit [indicating].

Q. Yes, sir. Mr. Halgerson, I am going to go through the list of casting processes or changes in the casting processes at Delaval.

If you would please specify for me whether any changes

that you will discuss are changes not set forth on this list that have been mentioned by Mr. Earley -- the list appended to Mr. Dobrec's deposition.

A. No. All the changes -- all the changes we have made are listed here.

Q. So, this list is an inclusive list?

A. It is inclusive as of today.

Q. With respect to gates, Mr. Helgerson, what changes did Delaval adopt with respect to gating of the cylinder heads?

A. Originally, the gating system -- which I think Mr. Dobrec explained to you the reason for a gating system so there's no use going through that again.

Q. I think you have to go through it again.

A. All right, sorry.

A gating system is to have the molten metal from the ladle go into the mold and into the various sections of the casting which have to be fed and to give a sound casting. It's called a runner system.

Portions of the runner system into the riser or casting products are called gates -- in-gates; therefore, when we first started out with the gating system, as such, we went into various areas of the casting and into the risers along the parting line between the cope and the drag. There is a possibility that occasionally, we pick up loose sand from this, because the metal flowing in these channels are channels that are usually rectangular or square for convenience of molding.

Subsequently, now, we changed that and we use as a core, a cross-gate at the bottom of our two big outside risers. We pour directly down into that and go across the gate so all the metal coming up -- the initial metal coming up immediately goes into the bottom of the casting and does not fall along any molding sand areas.

So, that eliminates any possibility of loose sand coming from the gating system into the casting. That was one of the major changes we made.

Q. Are there any other changes with respect to gating, Mr. Helgerson, that you can recall at this time?

A. Well, originally we had gates that go into two of the risers on the exhaust end. I removed those because they didn't help the situation.

So, I had them go exclusively into the outside risers, which is on each side of the casting where they go now with a different system. That was the major change in the gating system.

Q. Mr. Helgerson, with respect to -- let me see if I can group some of this together -- with respect to pattern equipment changes, are you familiar with changes which have been made by Delaval in pattern equipment changes?

A. I was responsible for it.

Q. Would those pattern equipment changes include core supports?

A. Some; a little. Some, yes.

Q. Would it include alignment of the core supports?

A. Oh, yes.

Q. Would it include the core materials?

A. Yes.

Q. And the core design?

A. No. Design is dictated by the blueprint. You can't change that.

Q. Let's take core supports, the core materials on the alignment. Is it fair to group those together as pattern equipment changes?

A. Not core sand; just the supports and the equipment.

Q. Core supports --

A. Core prints -- core supports, as you call it is core prints. We call it in the foundry industry: core prints.

Q. Core prints; alignment of the cores --

A. -- caused by the core prints.

Q. And core materials?

A. That has nothing to do with the equipment.

Q. Okay. Maybe we can't group these together, then.

A. You can in one respect for a simple reason. When we upgraded our equipment to get a better product, we went from cores that were made in oil or no-bake sand to shell sand, which eliminated any possibility of loose sand in the mold and made a much better finish and a higher quality casting.

Q. It eliminated any possibility of loose sand in the mold?

A. Right.

Q. From Mr. Pratt's affidavit and other discussions,

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 LILCO'S MOTION TOR A PROTECTIVE ORDER IN RESPONSE TO SUFFOLK COUNTY'S RENEWAL OF ITS MOTION TO COMPEL were served this date upon the following by first-class mail, postage prepaid, except by Federal Express, as indicated by an asterisk.

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