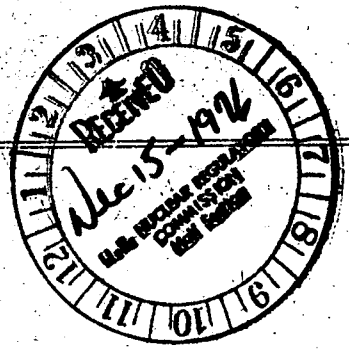
NUCLEAR REGULATORY COMMISSION



IN THE MATTER OF:

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

(Indian Point Station, Unit No. 2)

Docket No. 50-247
OL No. DPR-26
Extension of Interim Operation Permit

Place - White Plains, New York

Date - Thursday, 9 December 1976

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the matter of:	
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.	Docket No. 50-247 OL No. DPR-26
(Indian Point Station, Unit No. 2)	Extension of Interim Operation Period

Ceremonial Courtroom
Westchester County Courthouse
White Plains, New York

Thursday, 9 December 1976

The hearing was convened, pursuant to notice, at 9:00 a.m.

BEFORE:

SAMUEL JENSCH, Esq., Chairman, Atomic Safety and Licensing Board.

R. BEECHER BRIGGS, Member.

FRANKLIN C. DAIBER, Member.

APPEARANCES:

As heretofore noted.

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P R O C E E D I N G S

CHAIRMAN JENSCH: Please come to order.

As I recall, the cross-examination of Applicant's panel has been completed, is that correct?

(No response.)

I hear no request.

Is the Applicant ready to proceed with the cross-examination of the Staff?

MR. TROSTEN: Mr. Chairman, I have a suggestion to make concerning the agenda for today.

We have considered the testimony that was offered yesterday, and we have with us this morning Dr. O'Conner of the Institute of Environmental Medicine of New York University. We propose to have Dr. O'Conner sponsor several of the exhibits that were marked for identification yesterday, and we would propose that that be the first order of business this morning.

If there is cross-examination of Dr. O'Conner, we would propose that that take place this morning before proceeding with cross-examination of the Staff.

In view of Dr. McFadden's schedule, which requires that we do what we can in any event to try to see to it that he is able to leave tomorrow, we would propose to offer a limited amount of redirect testimony by Dr. McFadden, so that he would be in a position to be absent, with the Board's

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permission, from the hearing tomorrow.

We would then propose to commence cross-examination of the Staff.

CHAIRMAN JENSCH: Is there any objection to that schedule?

(No response.)

I hear no objection.

Will you proceed with Dr. O'Conner?

MR. TROSTEN: Yes.

CHAIRMAN JENSCH: Will Dr. O'Conner take the stand?

MR. TROSTEN: Dr. O'Conner is here with me at the witness table, Mr. Chairman, on my left. I would ask that Dr. Joseph Martin O'Conner be sworn.

Whereupon,

KENNETH L. MARCELLUS,

JOHN P. LAWLER,
and
JAMES T. McFADDEN

resumed the stand on behalf of the Applicant and, having been previously duly sworn, were examined and testified as follows:

Whereas,

JOSEPH MARTIN O'CONNER

was called as a witness on behalf of the Applicant and, having been first duly sworn, was examined and testified as follows:

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DIRECT EXAMINATION

BY MR. TROSTEN:

Q Dr. O'Conner, when and from what institution did you receive your undergraduate degree?

A (Witness O'Conner) I received my undergraduate degree from the College of the Holy Cross in Worcester, Massachusetts, in 1966.

Q And when and from what institution did you receive your Ph.D.?

A From the State University of New York in Albany in 1971.

Q What was your dissertation title?

A "Photoperiodic Control of Pituitary Gonadotrophin Release in Trout and in the Leopard Frog."

Q Dr. O'Conner, since you received your doctoral degree, what positions have you held?

A I have been employed since receiving my Ph.D. as a Research Associate at the University of Maryland, Natural Resources Institute, and as a Biologist with Lawler, Matusky and Skelly Engineers.

Presently I am a Research Scientist with the New York University Medical Center, Institute of Environmental Medicine.

Q Thank you, Dr. O'Conner.

Among your professional activities, have you been

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ADvisor in Fisheries Biology to the U. S. Department of Commerce, National Oceanic and Atmospheric Administration?

A. Yes, I have.

Q. During what years did you serve as an advisor?

A. 1972 to 1974.

Q. Dr. O'Conner, is it correct that you have offered a number of publications in your field of specialty?

A. Yes, I have.

Q. Dr. O'Conner, I show you the following documents which have previously been marked for identification as Licensee's OT-12, Licensee's OT-13, Licensee's OT-14, Licensee's OT-15, and Licensee's OT-16.

(Documents handed to the witness.)

I ask you, Dr. O'Conner, are you familiar with the contents of these exhibits that I have just identified for you?

A. Yes, I am.

Q. Are the contents of these exhibits true and correct to the best of your knowledge?

A. Yes, they are, to the best of my knowledge.

MR. TROSTEN: Mr. Chairman, I offer in evidence the exhibits previously marked for identification as Licensee's OT-12, OT-13, OT-14, OT-15, and OT-16.

CHAIRMAN JENSCH: Could you give us a little more foundation for the source or how the data were procured

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and utilized for those reports?

Did you conduct the research programs, did you assemble data from other sources, or how was it prepared?

WITNESS O'CONNER: For Exhibits 12, 13, 14 and 15 I was responsible for the assembly of data and interpretation of data which were placed in the reports for submission to Consolidated Edison.

CHAIRMAN JENSCH: Where did you get the data?

WITNESS O'CONNER: The data were obtained through a variety of sampling programs which were conducted in the Hudson River and at the Indian Point Power Station.

CHAIRMAN JENSCH: By whom?

WITNESS O'CONNER: By personnel of the New York University, Institute of Environmental Medicine.

CHAIRMAN JENSCH: Under whose direction?

WITNESS O'CONNER: The information accumulated for Exhibits 12 and 14 was accumulated under my direction.

The data for Exhibits 13, 15, and 16 were accumulated under the direction of Dr. Gerald Later, who was at the time of those studies Director of the Ecology Program at NYU.

CHAIRMAN JENSCH: And you placed the interpretation, that is, conclusions, from those data? Is that what the reports show?

WITNESS O'CONNER: Yes, sir.

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CHAIRMAN JENSCH: And you graduated -- you got your degree in -- did you say 1971?

WITNESS O'CONNER: Yes, sir.

CHAIRMAN JENSCH: Have you ever conducted any programs of your own other than these OT-12 and OT-14 exhibits? Was this the first program or programs that were under your direction?

WITNESS O'CONNER: No, sir, I was co-principal investigator on a contract at the University of Maryland with the Army Corps of Engineers to determine the effects of suspended sediments on estuarine organisms, and I had responsibility for program direction regarding Hudson River studies while I was employed at Lawler, Matusky and Skelly Engineers.

Subsequent to Exhibits 13, 15, and the investigations which generated the data in Exhibits 13, 15, and 16, I have directed the studies conducted by NYU on the Hudson River at Indian Point.

CHAIRMAN JENSCH: Just to put these dates in order, when did you do this Corps of Engineers work on suspended organisms?

WITNESS O'CONNER: Suspended solids.

CHAIRMAN JENSCH: Suspended solids.

WITNESS O'CONNER: 1970 to 1973.

CHAIRMAN JENSCH: And you left there, did you,

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to go with Dr. Lawler's organization, was that right?

WITNESS O'CONNER: Yes, sir, I did.

CHAIRMAN JENSCH: When was that?

WITNESS O'CONNER: That was in May of 1973.

CHAIRMAN JENSCH: After the completion of Exhibits 13, 15, and 16, when did you undertake on your own responsibility to do work in the Hudson River? Do you remember the data?

WITNESS O'CONNER: The date?

CHAIRMAN JENSCH: Yes.

WITNESS O'CONNER: Beginning in January of 1975.

CHAIRMAN JENSCH: Well, I guess that's the mechanics that I had in mind.

Are there any other foundation questions by any of the parties?

(No response.)

Is there any objection to the offer of Licensee's Exhibits 12, 13, 14, 15, and 16?

Regulatory Staff?

MR. LEWIS: No objection.

CHAIRMAN JENSCH: New York State Energy Office?

MR. KING: No, sir.

CHAIRMAN JENSCH: Attorney General of the State of New York?

MR. SHEMIN: I have no questions.

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CHAIRMAN JENSCH: Do you have any objection to the receipt in evidence of the documents offered by the Licensee?

MR. SHEMIN: I thought that was what I had said "No" to previously.

No, I have not.

CHAIRMAN JENSCH: I didn't hear you. I'm sorry. We have difficulty hearing generally because of the blowers.

Hudson River Fishermens Association?

MS. CHASIS: No objection.

CHAIRMAN JENSCH: Village of Buchanan?

MAYOR D'AVILA: No objection.

CHAIRMAN JENSCH: There being no objection, Licensee's 12, 13, 14, 15, and 16 are received in evidence.

(The documents previously marked as Licensee's Exhibits Nos. 12 through 16 for identification were received in evidence.)

CHAIRMAN JENSCH: Would you proceed, Licensee?

MR. TROSTEN: Mr. Chairman, if there is cross-examination of Dr. O'Conner, I would propose that it take place now. We have no further direct evidence to offer by Dr. O'Conner.

CHAIRMAN JENSCH: New York State Energy Office?

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MR. KING: We have no cross-examination.

CHAIRMAN JENSCH: Attorney General of the State of New York?

MR. SHEMIN: No questions.

CHAIRMAN JENSCH: Hudson River Fishermens Association?

MS. CHASIS: Yes, we do.

CHAIRMAN JENSCH: Proceed.

CROSS-EXAMINATION

BY MS. CHASIS:

Q Dr. O'Conner, as I understand it, you were involved in the analysis and interpretation of data in OT-16 but not involved in the actual collection of data, is that correct?

A (Witness O'Conner) That's correct.

Q I'd like to refer you to page 300 -- pages 300 through 302 of that document and ask whether you were involved in the writing of that specific section?

A Yes, I was.

Q And were you responsible for the conclusion which was drawn in that section?

CHAIRMAN JENSCH: Would you move that microphone a little closer?

MS. CHASIS: I'm sorry. It's so crowded.

CHAIRMAN JENSCH: Yes, it is crowded. I hope

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we can get back to the courtroom this afternoon.

BY MS. CHASIS:

Q Do you want me to repeat that question?

A (Witness O'Conner) Please.

MR. LEWIS: Mr. Chairman, we don't have that particular document in front of us. I was wondering if I might request that Ms. Chasis briefly outline what the conclusion is that she was referring to.

MS. CHASIS: Yes.

The section I'm referring to is a discussion of the plant and river comparisons, and this is densities of striped bass eggs, larvae and juveniles. A conclusion drawn in the section is particularly with respect to the collection of eggs, which were found to be several times more abundant in the intakes and discharges than they were in the river; and the conclusion is drawn that, because of the difference in the sampling regimes, to expect that the data -- to expect the data to be comparable was too much.

Now, I'm asking Dr. O'Conner if he was responsible for that conclusion.

MR. TROSTEN: You're referring to the last sentence?

MS. CHASIS: Yes. I'll read the last sentence. It says:

"Therefore, to expect these two different

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sampling programs to yield comparable data is too much."

BY MS. CHASIS:

Q Were you responsible for that conclusion, Dr. O'Conner?

A (Witness O'Conner) Yes, I was, in part.

Q And what was the basis for the conclusion? Can you explain?

A The key consideration in arriving at that conclusion is the fact that in sampling to determine abundances of ichthyoplankton in the river we are employing sampling devices which are not fixed with regard to their position in the water, whereas sampling in the plant, although we are using the same type of nets, we are using rigid and permanent frames, which result in a precise and accurate positioning of the sampling devices each time they are lowered into the sampling location.

Q And, therefore, you feel that the data gathered from the two different sampling programs -- you're not able to compare it with the ichthyoplankton sampling?

A What our conclusion is --

CHAIRMAN JENSCH: I wonder if you'd just stay with the question, and then you may explain it any way you want.

Do you recall the question, or would you like to

blt 12

have it restated or reread?

WITNESS O'CONNER: No, sir, I recall the question. That's true; they are not directly comparable.

CHAIRMAN JENSCH: While there's a pause, I wonder if the gentleman in the back -- I notice he's been doing some yeoman work here this morning -- I wonder if we could see if the blowers could be turned off? It's getting pretty warm in here.

Maybe there is some other adjustment that could be made. We might keep the doors open a little while.

Thank you very much.

Excuse me.

BY MS. CHASIS:

Q Dr. O'Conner, do you know whether the sampling methods were used -- the same sampling methods were used for the river and intake and discharge sampling in the year 1973?

A (Witness O'Conner) Yes, they were.

Q So the same statement could be made about that data as well, the data collected for that sample?

A In that they are not directly comparable, yes.

Q And is the same true for the data collected in 1975?

A Yes, it is.

MR. LEWIS: Mr. Chairman, we're having some

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trouble hearing the witness. I think it might be desirable if the witness were facing out towards the counsel tables.

MR. SHEMIN: Or maybe he could use a mike.

MR. TROSTEN: Let's get a microphone, because otherwise the Board won't be able to hear him.

MR. SHEMIN: The problem is he's between the two groups now. Whichever way he faces, somebody is going to be in trouble.

I was wondering if somehow we might be able to set up the table another way.

MR. TROSTEN: He could sit over there.

(Witness and witness table repositioned.)

MR. TROSTEN: Ms. Chasis, if you don't mind, why don't you sit over here?

CHAIRMAN JENSCH: She has all her books and papers in front of her.

If Dr. Marcellus could move back a trifle more, that might solve part of the problem.

(Counsel table repositioned.)

CHAIRMAN JENSCH: Thank you.

BY MS. CHASIS:

Q Dr. O'Conner, can you explain why the addenda to the 1973 report-- and the addenda I'm referring to is OT-15 -- did not appear until August of 1976?

MR. TROSTEN: The addenda is OT-13, addenda to

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the 1973 report?

MS. CHASIS: Yes. By the way, would you have an extra copy of that? I can't seem to find my copy.

(Document handed to Ms. Chasis.)

MR. TROSTEN: Would you repeat the question?

BY MS. CHASIS:

Q The question is: Would you explain why the addenda containing 1973 data was not issued until August of 1976?

A (Witness O'Conner) The date of issuance of the final report is, as you say, 1976; however, the majority -- all of those data were prepared in report form and issued publicly in either August or December of 1974.

The reason the final version of the report was not issued until August of 1976 had to do with the necessity of completing the 1974 report and the necessity for completing a single analysis having to do with the time coincidence sampling which went on during the 1973 study.

So the data were in fact issued in 19[illegible]. The final report was not issued until 1976.

Q I see.

So all the data contained in here was in the '74 -- the progress report for '73?

A All the data were, yes.

Q And the analyses?

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A One additional analysis remained for completion at that time.

Q Now, I'd like to draw your attention to page 49 of Exhibit 13, OT-13, and to the second full paragraph on that page.

Did you write this portion of the report?

A Yes, I did.

Q And in that paragraph the conclusion is reached, or the statement is made, that:

"The results and conclusions contained in this report, based upon a single season's sampling of striped bass life history stages, cannot provide an estimate of real or potential impact of the Indian Point Power Station on Hudson River striped bass. The information herein, by inclusion in models designed to provide such estimates, serve to increase the data base required for more refined model estimates."

Could you explain in particular what you mean by the first sentence in that paragraph?

A Yes, I can.

First of all, the sampling which was carried out was aimed only at the ichthyoplankton, and the results of any type of influence on a population as a whole couldn't possibly be surmised simply by studying the juvenile life

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history stages thereof.

Second of all, the results contained in this report dealing with studies in 1973 are results deriving from plant operation without delta t, and therefore it is primarily a pumping station rather than a power plant which we were dealing with.

Thirdly, I think it would be fair to say that anyone would be hard-pressed to derive conclusions as to the impact on a population with as much as a 13-, 14-year life cycle from a single year's sampling.

Q I see.

Now, you said that the data collected in 1973 could not be truly reflective of plant impact because there was no delta t. In your opinion, does delta t contribute to the mortality, entrainment mortality?

A In my opinion, it contributes to mortality to a certain extent. I would have to qualify that, though, and say that the mortality induced by temperature at the Indian Point Station is -- what would be the best way to say it? -- not as significant as had been thought in earlier proceedings.

CHAIRMAN JENSCH: Can you identify in the earlier proceedings where the projection was made that gives you the comparison that you make?

If you can't do it now, you could locate the section and give it to your attorney.

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The broad, blanket assertion that, "Well, this is better than it was then," isn't quite specific enough.

MR. TROSTEN: Are you referring to the Indian Point operating license proceeding?

WITNESS O'CONNER: Yes.

CHAIRMAN JENSCH: If you would, find out where the mortality entrainment problem was there discussed which is greater than he thinks it now should be.

MR. TROSTEN: The heat problem, Mr. Chairman, as I understand it, delta t.

CHAIRMAN JENSCH: Yes.

MR. TROSTEN: I will.

BY MS. CHASIS:

Q I'd like to direct some questions to the studies that were made of latent mortality.

Am I correct that in the years 1973 and 1974 72-hour holding periods were used to examine the latent mortality of the ichthyoplankton which was passed through the plant?

A (Witness O'Conner) I believe you're correct. I'm just checking to make sure that these data were in fact for 72 hours.

(Witness reading.)

Yes, that's correct.

Q Now, I know you were not directly involved in the preparation of OT-15, but I'd like to draw your attention

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to page 248 of that exhibit. There's a discussion of latent effects results.

In describing what has occurred, there is a suggestion that the results of latent effects -- this is on page 248, paragraph -- the first and second paragraphs on that page --

A Yes.

Q There is a suggestion that the possible second mode of death might be the result of latent effects just beginning to express themselves between 48 and 72 hours after collection.

The report goes on to say:

"To examine this possibility, the plant ran additional tests in which juveniles and larvae would be held for longer than 3 days."

Was this done in 1974?

A No. The latent mortality studies carried out in 1974 were also carried out for 72 hours, as indicated in the report.

Q Why, if this phenomenon was being observed and there was a suggestion that the effects might not be showing up until the end of that period, was the examination period of latent mortality not extended?

A I can't answer that directly for the 1974 study, but I can for the 1975 study.

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In 1975, it was our intention at the beginning of the study to carry out the latent mortality testing for 96 hours. We generally observed, however, that mortality rates were so high during the first 72 hours, as indicated in the previous reports, that there were too few organisms still remaining between 72 and 96 hours, either among control or experimental organisms, to have a valid test beyond 72 hours.

Q So that doesn't mean that there could not have been significant deaths after that period? It means you just couldn't test for that? Is that correct?

(The witness conferring.)

CHAIRMAN JENSCH: Let him answer the question first, Dr. Lawler. Then if you want to supplement it yourself or have him do it, it will be all right.

Could you restate the question?

BY MS. CHASIS:

Q The question is: That doesn't exclude that there could be significant deaths after that period. It just means that you couldn't test, run the test long enough to examine for that? Is that correct?

A (Witness O'Connor) There were too few organisms remaining to determine if there were significant mortality.

Q So the answer is yes?

A Yes.

Q Now, you were involved in the studies of

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mortality of striped bass eggs and larvae in nets, is that correct?

A That's correct.

Q The results were reported in OT-14.

Now, you have concluded that net mortality is a contributing factor to the observed mortality, plant entrainment mortality, is that correct?

MR. TROSTEN: Are you referring to a specific conclusion?

MS. CHASIS: That's the conclusion, basic conclusion, of this report, is it not?

WITNESS O'CONNER: The basic conclusion is that net mortality contributes to the mortality which we observed in plant studies, yes.

BY MS. CHASIS:

Q Now, the studies which you made were laboratory studies, is that correct?

A (Witness O'Conner) Yes, they were.

Q Has there been any testing of your results in the field?

MR. TROSTEN: What do you mean by "testing in the field," Ms. Chasis?

MS. CHASIS: Well, I'm referring to page 20, the last page of this report. There is a sentence in the first full paragraph, the second to the last sentence, and I'll

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read it:

"This hypothesis --" namely, that mortality of ichthyoplankton in power plant discharges is a combination of net mortality and plant-induced stress -- "may be tested in controlled conditions such as at the Con Edison experimental flume."

Now, in your opinion, has that been done?

This is the second to the last sentence here, the first full paragraph.

WITNESS O'CONNER: A direct comparison between net mortality as tested in the flume and mortality occurring across the plant has not been tested.

CHAIRMAN JENSCH: The answer to the question, then, is no? I didn't know whether you were describing a different process than her question envisioned.

WITNESS O'CONNER: Yes, that's correct.

BY MS. CHASIS:

Q Then would you consider that a critical step in the testing of your hypothesis?

A (Witness O'Conner) Yes.

MS. CHASIS: I think that's all.

MR. SHEMIN: Mr. Jensch, I have one question in one area, following up what she asked.

CHAIRMAN JENSCH: Proceed.

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BY MR. SHEMIN:

Q Just so it's clear and I understand your testimony, to sum it up very quickly, in '73 and '74 they ran latent mortality tests for 72-hour periods. It was suggested that, since deaths may be occurring after the 48- to 72-hour period, the tests should be extended for longer periods. It was attempted, and it was found that, given the size of the sample after the 72-hour period, there just weren't enough organisms left to draw significant conclusions; so the 96-hour period was dropped.

Is that a fair summary?

A (Witness O'Conner) The 96-hour period was not dropped. The 96-hour period was used as a testing period, but the results beyond 72 hours, usually due to an insignificant number of control animals, were simply not useful.

Q Fine.

Now, the testimony on page 32, who prepared this? Did you have anything to do with the preparation of this testimony -- well, your name is not on the document. I assume you didn't. It's the testimony of K. Perry Campbell, John P. Lawler, Kenneth L. Marcellus, Mallory S. May, and James T. McFadden.

You didn't have anything to do with the preparation of this?

MR. TROSTEN: What do you mean by "having anything

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to obtain significant results and the NYU people were not because of differences to some degree in part of the program?

A. Because of differences in sampling, yes.

Q. They sampled larger amounts than you did?

A. No, they utilized a totally different technique from the technique utilized by NYU.

Q. That permitted them to make statements based on seeing that size of samples?

A. The sampling device they were using was specifically designed to reduce the magnitude of sampling stress on the organisms, and as a result their organisms were in better condition and able to survive longer and to give full 96-hour latent survival studies -- results to the 96-hour latent survival studies.

Q. Why would a 96-hour period be chosen? Why is it just one extra day rather than two or three?

A. Generally, in any kind of testing procedure, bioassay testing procedure, the results at the end of 96 hours are considered to be representative of actual conditions.

Q. You didn't think it would be worthwhile to run any at all to see whether in this particular instance, with respect to striped bass eggs and larvae, it wouldn't be the case?

A. I think you're making reference to the 1973-1974

blt 25

reports, is that correct?

Q For '73 and '74 you didn't run them more than 72 hours. What I'm wondering is, when it became clear that someone should perhaps run it for longer, I was just wondering whether or not it might be considered that, since the extent of our knowledge, particularly with respect to striped bass, wasn't complete in the studies that were being run, whether it might have been wise to not rely on the time periods used for other organisms in other studies and have some sort of run here for more than just four days? Is that a possibility?

A I believe I stated earlier that in 1975 the latent mortality studies were conducted for 96 hours.

Q That's four days. I was wondering -- there wasn't any consideration given to a period longer than that for this species as opposed to relying on tests for other organisms and other durations?

A That's correct. No plans were made for carrying them beyond 96 hours.

MR. SHEMIN: I have no other questions.

xxxx

EXAMINATION BY THE BOARD

BY DR. DAIBER:

Q Dr. O'Conner, you just indicated that you used nets for your collecting device and someone else used a larval table.

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A (Witness O'Conner) Yes.

Q Did you use your net collecting device before these other people used their larval sampling table technique or after?

A Both before and after.

Q I find it intriguing that you have certain kinds of results and they got very markedly different kinds of results based on simply the mode of collecting the eggs and the larvae. Is this correct?

A Yes, basically.

Q I'm wondering why you didn't shift over, if they had such good results, or better results than you did, why you might not have evaluated that the larval table was a better procedure?

A The sampling program carried out at Indian Point made use of nets in response to the requirements of the environmental technical specifications.

Q In other words, someone else spelled out the technique for you?

A Basically, from the time of inception of a specific technique, it was dictated as to which particular type of gear would be used.

Attempts were made to modify the nets to minimize sampling damage -- for example, by the addition of comb-shaped devices on the front ends of the nets to try to reduce the

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velocity inside the nets and consequently increase survival; however, we were constrained to the use of nets.

Q And someone else, having observed your experiences, was able to develop a new technique for collecting? Is that the inference that one could draw?

A More or less the inference. Actually, the development of alternative sampling techniques came about through discussions in the IUCC, or Interutility Coordinating Committee, which all the contractors took part in, and also independently.

The combs were developed as a result of discussions within IUCC. The larval table was developed, partly due to discussions which went on in IUCC and partly at LMS.

Q So, if you had the opportunity to do this over again, you would shift perhaps to the larval table technique?

A I don't believe by environmental tech spec we would be allowed to shift.

CHAIRMAN JENSCH: Assuming that you were.

WITNESS O'CONNER: We would include alternative sampling devices in the program.

BY DR. DAIBER:

Q So another inference that could be drawn is that the kind of results that one might get is determined very largely by the sampling procedure that was initially employed?

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A (Witness O'Conner) Yes, I think that's fair to say.

DR. DAIBER: That's all I have.

BY CHAIRMAN JENSCH:

Q Did you make any recommendation that the technical specifications be changed so that management at Con Edison could consider it and perhaps have the technical specifications changed?

A (Witness Marcellus) Sir, Con Edison has considered modification of the technical specifications in many instances and has applied for specific changes in certain circumstances, and we have experienced considerable delays in getting --

Q I'm not considering your problems, Dr. Marcellus. Just tell us if you made a recommendation to change from net to a larval table.

A We have not made a recommendation to change, for the reason that we could not get the change in and reviewed by the Staff and implemented in the same season.

Q Could you anticipate that it might be useful in the next season and therefore make the recommendation for the change for that period of time?

A It's certainly possible, and we are considering that.

Q Well, what's holding it up? If the gentleman has

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indicated it gives you so much better results, why is there a delay in your consideration? Is there some other factor that you want to include in this consideration?

A Perhaps it's a hesitancy on our part to apply for a recommendation when the Staff has indicated a great concern about changing the scope of the program.

They have rigidly specified that they wanted to see continuing repetition of the original program for duplication or comparison of results from year to year.

Q You say they have told you that, that they didn't want to change or hear any recommendations from you for a change? Is that right?

A I wouldn't say they told us they didn't want to hear a recommendation for a change, but they have not been too interested in changing the program, changing the gear that has been used in the past.

Q Well, I can't read their mind; but, in any event, you have never submitted a formal recommendation for a change to get better results, as I understand the description by Dr. O'Conner--is that correct--by the use of a larval table?

A With respect to the larval table, that's correct.

Q Thank you.

A (Witness O'Conner) May I add something with regard to the necessity for using nets at the Indian Point

blt30

Station for deriving survival estimates?

The observation or the proposition that the nets were contributing to mortality in a substantial way was in fact the -- at least part of the driving force behind our implementing the study in the flume to try to quantify the extent to which the nets may be causing mortality at the different velocities which we observed in the plant.

Also, with regard to the larval table, I think it's necessary to bring out the fact that the table was developed in 1974 and run through some crude testing at that time and was not really field implemented until 1975, until the past sampling year. So it was not until 1976 that we were able to observe the actual improvement of survival due to inclusion of the larval table in the programs at Roseton and Bowline.

It is also necessary to note that prior to the 1976 sampling program at Indian Point, and right at the present moment, there have been discussions ongoing between Con Edison's Biological Department staff and the contractors regarding the inclusion of devices specifically designed to decrease mortality of organisms due to collection.

So Con Edison has not excluded inclusion of the larval table or alternative devices which possibly might be better.

Q. The first part of your last answer indicated that

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this larval table or something, or this deficiency in net collection, was kind of a motivating factor from wanting to test it, your net collection procedures, through the flume, did you say?

A. Yes, sir.

Q. And did you ever do that? Have you ever tested it through the flume?

A. Yes, the mortality induced by the sampling procedure was tested directly at the Alden flume. The results are contained in OT-14.

Q. But that's not at Indian Point.

MR. TROSTEN: No, it's the flume at Alden Laboratory.

CHAIRMAN JENSCH: At Alden Laboratory.

BY CHAIRMAN JENSCH:

Q. So, in other words, you haven't tested anything actually at the site of the Indian Point facility, is that correct?

A. (Witness O'Conner) That's correct.

Q. Thank you.

MR. BRIGGS: I don't have any questions now. It seems to me they've been asked.

But it does seem to me Con Ed could use a bit different philosophy in requesting changes to the technical specifications.

blt 32

It seems to me if something is obviously better, to use an old saying, it's better to have asked and lost than never to have asked at all.

MR. TROSTEN: Let me address that just a moment.

What I'm saying is not intended to castigate the Staff. What Dr. Marcellus has said is correct. We have had problems and arguments over comparability of data.

MR. BRIGGS: I understand that, and we've heard it all.

MR. SIEMIN: Could I just ask one question to clarify? I'm not sure I understand.

It's my understanding from reading all the technical reports here, what's gone on with sampling in the past -- and correct me if I'm wrong -- the problem with switching sampling gear relates to data which is intended to be used for interyear comparisons, year-to-year comparisons.

Now, is the work being done on entrainment mortality running through the plant intended to be used for interyear comparison or just intended to test the plant's mortality? Which is it?

WITNESS MARCELLUS: You're correct in saying that there is great interest in comparing year to year variability; however, to go back to my original comment, we have had great difficulty in getting programs implemented

blt33

when we have gone to the NRC and asked for a tech spec change or permission to conduct experiments of various nature.

To go back to what Dr. O'Conner has just indicated here, the results of this program have only recently become available, and we cannot go to the NRC Staff without some supporting evidence to say that this program is better than the one that we've been conducting previously. Without the supporting evidence we are turned down.

MR. SHEMIN: That's a different statement than you made previously.

MR. BRIGGS: That's right. It seems to me that's a more important statement, that you didn't have any evidence to go to them with, and so maybe sometime in the future you will have.

WITNESS MARCELLUS: I would say at this moment we do have good evidence.

MR. BRIGGS: All right.

WITNESS McFADDEN: May I expand Dr. Marcellus' answer to agree with Mr. Shemin that, in the case of survival data during the entrainment process, we don't feel that there is a necessity to monitor the year-to-year changes.

We would assume that once that figure is accurately fixed the same condition would prevail over all years.

blt34

DR. DAIBER: So on that basis one could change from the net collecting technique to the larval table procedure without any problems of interpretation of the results?

WITNESS McFADDEN: Yes, sir.

MR. LEWIS: Mr. Chairman, when you made the rounds of people who wanted to do cross-examination, the Staff does have some cross-examination.

CHAIRMAN JENSCH: Yes, we are coming back. We thought you wanted to be last.

Have you completed, Hudson River?

MS. CHASIS: Yes, sir.

CHAIRMAN JENSCH: Attorney General?

MR. [redacted]: Nothing further.

CHAIRMAN JENSCH: Village of Buchanan?

MAYOR D'AVILA: No questions.

CHAIRMAN JENSCH: All right. Proceed, Regulatory Staff.

WITNESS MARCELLUS: May I quote something from the environmental technical specifications pursuant to the entrainment sampling?

CHAIRMAN JENSCH: If you could just give us the paragraph, we'll read it.

WITNESS MARCELLUS: It's paragraph, or section, No. 4.1.2.a.(2)E., identified as "Administrative Controls on Schedule and Changes."

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CHAIRMAN JENSCH: We'll take note of that. Thank you.

Will you proceed?

xxx

CROSS-EXAMINATION (Continued)

BY MR. LEWIS:

Q Dr. O'Conner, you stated several times that in your view the environmental technical specifications precluded you from using a larval table sampling technique, is that correct? Was that your testimony?

A (Witness O'Conner) It did not preclude us from utilizing a larval table, but the tech spec demanded that we carry out a certain type of study and within the constraints of budget and manpower for the time which has passed. Through agreement with Con Edison, we have carried out only those studies.

There was a plan for 1976 to test an alternative sampling device, not a larval table but a device aimed at reversing sampling mortality of ichthyoplankton in the discharge; but, due to difficulties of the operation schedule of Unit 3, that plan was not implemented.

Q Do you know whether or not the results achieved with larval table techniques were -- whether or not the Staff was aware -- the Staff and the industry and people involved in these studies in general -- were aware of the results that were achievable with larval table sampling

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techniques at the time the environmental technical specifications were drawn up for the Indian Point Station?

I believe that the environmental tech specs were worked on, in any event, over a year ago.

A Yes.

Q So my question is, at that time was there an awareness of the results that were achievable with larval table sampling?

A I would think not.

Q Would it be your opinion that perhaps the technical specifications were written up with the state-of-the-art in mind when they included a description of a program that was based upon net sampling?

A I would assume so.

Q Now, I believe there has also been testimony -- and correct me if I'm wrong -- that up until this date Con Edison has not approached the Staff for discussions as to whether or not larval table sampling might not be a permissible additional or alternative approach under the tech specs.

Have there been discussions with the Staff about that possibility?

A (Witness Marcellus) Con Edison has not approached the Staff with respect to using a larval table. I feel that the Staff would be greatly interested in the results,

blt37

and I think they would probably like to see the program implemented; however, we cannot approach it until we do have some information.

Q I hear you saying that, but I have no reason to believe that's the case.

In any event, it appears you have not approached the Staff. You apparently -- has it been your testimony, Dr. Marcellus, that you felt deterred from doing so because of some perception that you had that the Staff would somehow be obstinate about any changes in the type of sampling that would be undertaken?

A I can't say what the Staff will think; however, I can speak from experience of discussions with the Staff of various programs, and we have had certain occasions when it has been over a year that we've applied for a tech spec change and results have not come back from the Staff on whether or not we would be granted that change.

If we're talking about an implementation of a change in the entrainment monitoring program for 1977, Con Edison has not written up a request for that change at this moment, and we only have five months before we must be in the field and ready to go. If we must allow some time for the contractor to get geared up to conduct the work -- for example, two weeks as a basic minimum; perhaps a month would be more applicable -- we're only talking about four months

in which we can apply to the Staff and get a response back. I don't believe that we can obtain a tech spec change in that period of time.

Q Well, perhaps when I have the Staff witnesses on the stand they will be able to articulate a little better what their attitude is about this, and maybe that will give you a little bit better reading on what the willingness of the Staff with respect to this matter might be.

Now, with regard to Licensee's OT-13, the addenda to the '73 report -- and this would be for Dr. O'Connor -- I'd like you to turn to page 49. I'm referring to the final sentence on that page, which I might as well read.

"The results and conclusions contained in this report, based upon a single season's sampling of striped bass life history stages, cannot provide an estimate of real or potential impact of the Indian Point Power Station on Hudson River striped bass. The information herein, by inclusion in models designed to provide such estimates, serve to increase the data base required for more refined model estimates."

Dr. O'Connor, my question is, can the "results and conclusions contained in this report," which I understand to be that the concentrations of striped bass life stage in front of the intake is higher than the riverwide

concentrations, can these be used to provide a reliable estimate of the f_i factor?

A. (Witness O'Conner) I would have to say that to date perhaps -- these are perhaps the best data available for such an estimate. Whether or not that estimate is reliable in terms of an optimum sampling program and adequate sampling of the water column in the intakes will have to depend upon the results of additional sampling.

Q. Well, yes, but obviously --

CHAIRMAN JENSCH: Excuse me. I wonder if we could have a little more direct answer to that question?

I think you've explained it. I wonder if you could give us what your ultimate conclusion is.

I think the question was: Can these concentrations be utilized for some purpose, yes or no?

WITNESS O'CONNER: Yes.

CHAIRMAN JENSCH: Okay.

BY MR. LEWIS:

Q. Now, you apparently have some reservations. You began to discuss some possible reservations about the way in which they can be used. Would you continue with that?

Do you have reservations about the use of these data to estimate an f_i?

A. (Witness O'Conner) There is always a reservation as to how comparable the data are, based upon the fact that

were comparing a towed net with an indeterminant, more or less indeterminant, position in the water column with a fixed sampling device. So one cannot remain always convinced that the towed nets are sampling precisely the same portion of the water column that the intake nets are sampling.

Q In other words, this relates back to your comments to Ms. Chasis before with regard to non-comparability because of differences in types of nets. You're referring back to that statement?

A Yes.

Q Well, let me ask you this: Have you made any estimates of what the appropriate correction factor should be for differences between sampling results with towed nets and with fixed nets?

A No estimates as to a correction factor. There have been suggestions made by myself to Dr. McFadden, and consequently Dr. McFadden has made recommendations to Con Edison regarding an optimal field program which would be carried out in order to obtain better data -- better data with regard to concentrations in the river in the vicinity of the intakes.

Q Well, in other words, you did not make a recommendation as to what an actual correction factor should be?

A No, sir.

Q Is this because you felt the data you had was

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insufficient to make such a recommendation?

A Yes, I think that's fair to say.

Do you mean a recommendation as to a correction factor?

Q Yes.

A Yes.

Q A fairly specific recommendation as to your judgment of what a correction factor should be.

A Yes.

Q You're familiar with -- strike that.

Was NYU the principal contractor studying the [illegible] in front of the Indian Point site?

A We were one of the two contractors studying the entrainment there, yes.

Q Who was the other contractor?

A Ecology Instruments has one or two stations in the vicinity of Indian Point -- Mallory, could you correct me on that?

DR. MAY: We sampled in the region of Indian Point. We do not have per se what you would call stations. Our sampling within that area, as it is in all the regions, is random.

But we do take, Mr. Lewis, routine samples on a weekly basis during our ichthyoplankton sampling periods in the vicinity of Indian Point.

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And I believe that additional to that -- are there other studies, ichthyoplankton studies, being done in that area besides NYU?

BY MR. LEWIS:

Q Perhaps I can focus this question and maybe the answer will be more apparent.

With respect to transect studies at Indian Point, is that basically NYU?

A (Witness O'Conner) Transect studies were only carried out in 1973.

Q Right, but they were done by NYU. That was the contractor involved. There wasn't any other contractor, is that right?

A Not with regard to those transect studies; that's correct.

Q Dr. O'Conner, have you yourself, or anyone who works under you at NYU, estimated by way of any procedure values for the f_i factor for the various life stages?

A No, sir, we haven't.

Q Was this based upon a view that the data you had was insufficient to make such recommendations?

A No. The estimation of an f_i factor, since that factor is part of the LMS model, that estimation from the available data is made by LMS.

Q All right.

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If you could look in the testimony of Dr. Campbell, et al., on Table F-1, page 43 -- and I'm looking particularly at the entries under Indian Point.

First of all, are you familiar with the f factors set forth in this table?

A In a general sense, yes.

Q Were they derived by you?

A No, they were not.

Q By whom were they derived?

A I assume they were derived by NMS, utilizing the data which we provided to them.

Q Do you have any reservations concerning the biological reality of the f_i factors in Table F-1?

MR. SHEMIN: Excuse me. Could I get a clarification, because there's going to be an ambiguity in the record.

F_i is the characterization the Staff has used for their f factors. Applicants have used f_1 and f_2, and this table is f_1. I'm afraid we're going to have an ambiguity in the record.

CHAIRMAN JENSCH: I was concerned about that, also.

You're really referring to the f_1 factor, are you not? And you've so understood that, have you not?

WITNESS O'CONNER: Yes.

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CHAIRMAN JENSCH: As shown on page 43?

WITNESS O'CONNER: Right.

To get back to your question, Mr. Lewis, no, I don't have any reservations as to the biological reality of the f factors calculated based on our river samples.

BY MR. LEWIS:

Q Do you believe they are consistent with the values set forth in OT-14 -- excuse me -- OT-13? I believe it's Tables 19 and 20.

A (Witness O'Conner) I would have to say there is no real comparison, because the LMS f_1 factor based on the 1973 data was calculated from river cross-sectional concentration data and not from intake data.

MR. SHEMIN: Are you sure you're not referring to f_2 on the next page? That's the ratio of the intake to-- the intake quadrant to the concentration in the vicinity of the plant.

MR. LEWIS: One moment, please.

(Pause.)

BY MR. LEWIS:

Q Dr. O'Conner, let me ask you this: What values in Table F-1 or Table F-2 or product of those would be comparable to the values set forth in Tables 19 and 20?

You indicated that they were not exactly comparable. Is there some extrapolation of Tables F-1 and F-2

blt 45

that would make them comparable?

A. (Witness O'Conner) I'm getting a little bit confused here, and let me point out why.

First of all, you're making reference to f factors, which are, to my understanding, basically proportional values based upon actual data, and asking me to draw some sort of comparison between those proportional values in our Tables 19 and 20 in Exhibit 13, which are simply presentations of the results of statistical analysis. There are no numerical values in Tables 19 and 20.

Q. That is correct, but there are relationships expressed, which is greater --I mean, therefore, if you're talking about more than 1--if the abundances in front of the intake are greater than the riverwide abundances, your values, even if you don't state exactly what the value is, you're talking about greater than 1, is that correct?

A. Yes, we are.

Q. What I'm wondering is, do you have an opinion as to what should I compare that to in Tables F-2 and F-1 or perhaps there's some product of those two tables which would be the appropriate figure for comparison purposes?

A. Perhaps Dr. Lawler would be the person to best explain.

MR. SHEMIN: I think what he's asking is, is an intake station a station in the intake or in the vicinity

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of the intake, and therefore is it an f_1 comparison or an f_2 comparison that those documents refer to, Tables 19 and 20?

MR. TROSTEN: Is that your question, Mr. Lewis?

MR. LEWIS: I'll be happy to have that question answered. I was feeling my way a little bit here.

MR. TROSTEN: Would you repeat the question, please?

MR. SHEMIN: Does the term "intake station I-1" in Table 19 in Exhibit 13 and "I-2" in Table 20, does that refer to a station in the intake, which would be relevant to the f_2 determination, or is it in the vicinity, which would make it an f_1 determination?

WITNESS O'CONNER: It's in the intake forebay.

MR. SHEMIN: So it's an f_2 determination relating to Table F-2 on page 44, if anything?

WITNESS O'CONNER: If anything.

BY MR. LEWIS:

Q Dr. O'Conner, does the R factor in Table 20 of OT-13 refer to the vicinity of the plant or to the cross-section of the river?

A (Witness O'Conner) Cross-section of the river. It's a river average value.

Q Well, in light of that, would it be your testimony that the comparison to be made here is simply to

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Table F-2, or is it to some combination?

It appears to us it is to some combination, some product of the values in Table F-2 and the values of Table F-1.

MR. TROSTEN: Mr. Lewis, Dr. O'Conner has testified that he was not responsible for the combination -- for the preparation of the f factors.

I think your question should be directed to Dr. Lawler. Dr. Lawler is prepared to respond to those questions on the values developed in that table.

MR. LEWIS: All right. Let me ask Dr. Lawler.

BY MR. LEWIS:

Q Are we correct in our understanding that the comparisons -- the appropriate comparison of Tables 19 and 20 to get a comparability is to some product of the values in Table F-2 and Table F-1?

A (Witness Lawler) Yes, sir, you're correct.

As I indicated to you yesterday, the values in Table F-3, which come out of the results of Table F-1 and F-2 for Indian Point, particularly for eggs, do not agree with the values in the supplement.

I indicated to you that the reason for that was that we did not have those numbers at the time these values were computed, which was in the spring and early summer of 1974.

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I took the opportunity to take the data given in Tables 17 and 18 last night to see what kind of results I would obtain for eggs and larvae at Indian Point. In the case of eggs, as I indicated to you, the egg values are higher than 1, which is 1 now being the f_1, which is the designation the Staff has used, or f_1, f_2, the product, the designation we have used.

In the case -- I think I also indicated to you that we found similar behavior in 1974 and in 1975.

Now, the average value for the product for eggs in 1974, using the data in Table 18 -- Table 17 and 18 -- computes to 3.8.

Q I'm sorry. I missed that number.

A It computes to 3.8.

As I indicated to you also -- well, in the data for larvae, yolk-sac larvae computes to .75, and the data for post-yolk-sac larvae computes to .67.

Juveniles is not computed. You can't compute the juvenile from this data, because it extends through the end of August, or close to the end of August, well beyond the period that the juveniles are considered to be vulnerable to entrainment. So I made no computation on juveniles.

I think I also indicated to you that the results or the use of the NYU data in 1974-1975, the information that's going into the McFadden report and the January 1977

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report, is based on the data at the Indian Point Plant as well as in the Hudson River, whereas specifically here in the case of eggs the data was not.

I should further state that in our computation of the f factors we do not limit ourselves to the intake values. We have also used the discharge values. Sometimes we find the discharge values higher. Sometimes we find the discharge values lower. But the f factors that we've computed in Table F-1 and Table F-2, for instance for larvae, where we do have data at the plant, is lower than the f factor values that you would get if you simply take data in Table 18 and Table 17. But in all cases, including Table 18 and Table 17, the f factor values are less than 1 for the larvae.

Finally, I would like to comment that it's always been my opinion -- and I've mentioned this on many occasions before -- that as far as the thrust of all of this on the impact estimate goes, the fact that you may have a situation where the egg concentration is greater than 1 has very little impact, har very little effect on the overall impact. The reason for that is that every single one of these models, whether it's an LMS model or any other model, or any other estimating procedure, requires that the time the organism is in the specific life stage also is part of the computation procedure. The total life stage period vulnerable to entrainment in the models currently used is 64 days. The

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eggs constitute 2 days of the 64.

So the fact that the NYU results for 1973 show higher egg concentrations than those that we used and that appear in Table F-3 will not change the impact result significantly.

CHAIRMAN JENSCH: Just one thing.

In your answer you referred to a supplement. Do you mean OT-13?

WITNESS LAWLER: Yes.

MR. TROSTEN: It is OT-13.

CHAIRMAN JENSCH: Proceed, Staff.

BY MR. LEWIS:

Q Dr. O'Conner, I realize that you just heard Dr. Lawler's comments on this for the first time, but he did mention a value of 3.8 as resulting from application of the information in Tables 17 and 18 of OT-13.

Do you have an opinion as to the biological reasonableness of that figure?

I think we're talking about f_i or f_1 f_2, whichever you want to use, factor of 3.8 for eggs.

Is that correct, Dr. Lawler? Is that your testimony?

A (Witness Lawler) My testimony is, if you take the data in the supplement, which is Exhibit 13, and Tables 17 and 18, which is only the intake data, and a comparison

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of the other data in the same table, you would get a value for eggs of 3.8.

Q Dr. O'Conner, my question to you is do you have an opinion, are you able to have an opinion, based on Dr. Lawler's statement as to the biological reality of that figure 3.8?

A (Witness O'Conner) That value of 3.8 ratio between intake and river is based upon the 1973 sampling program, which was a relatively extensive and intensive sampling program and in my mind represents perhaps as best a description of conditions in the vicinity of the plant as is currently available.

Insofar as the ratio is relatively high, it's my opinion that the abundance and distribution of this particular stage of the life cycle of striped bass -- that the distribution should be sampled again to verify those initial results.

CHAIRMAN JENSCH: Excuse me. I think the question was: Do you have an opinion as to the biological reasonableness of that ratio? Is it reasonable or not?

WITNESS O'CONNER: I wouldn't want to say if it's reasonable or not. My opinion is that the distribution of this life history stage should be studied again in order to determine if the original estimate holds up under additional sampling or to determine if it can in fact be modified in

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one direction or another through additional sampling. This is one year.

WITNESS McFADDEN: Insofar as the use of those estimates and impact estimations is concerned, it's my opinion, and an opinion shared by all of the scientists that are involved in the impact estimates, that it is unlikely that the real biological situation can be one in which there was a persistent, say, nearly four times larger density of eggs going into the plant than was present in the river. It seems basically illogical.

However, in the absence of the further data that Dr. O'Conner recommends as desirable, we have gone ahead in the latest estimates of impact and used those higher numbers, realizing that if they're biased, they're biased in the direction of exaggerating impact on the eggs.

BY MR. LEWIS:

Q You say, Dr. McFadden, higher numbers, but do have reference, when you say you used the higher numbers in your analysis, do you have reference, for example, to a figure of 3.8?

A (Witness Lawler) The calculations that were made to date --

CHAIRMAN JENSCH: Let's let Dr. McFadden answer the question, and then you can give a comment.

I think he'd like to have the question directed

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to your last previous statement.

WITNESS McFADDEN: The numbers we have used are in some cases considerably in excess of a value of 1, which would seem to be the maximum logical value for that f factor.

The exact numbers in excess of that value of 1 is a question I'd have to refer to Dr. Lawler for an answer.

WITNESS LAWLER: Two comments.

First of all, the data that we're using for 1974 and 1975 show a number for 1974 for eggs at Indian Point of 1 and for 1974 for eggs at Indian Point of less than 2.5. I say less than 2.5 because I don't have in front of me a direct calculation. I know it's less than 2.5.

End 1

I'd like also to comment that on a long-term basis, from a mathematical standpoint, if not a biological standpoint, it would be impossible to have a number greater than 1, unless the fish were actually spawning in the plant. But that does not mean that we should not be using values greater than 1 in the actual modeling procedure, because -- well, I'll take that back.

It's a little hard to justify, from a conservation point of view, a material standpoint, where the eggs are coming from if you use a value greater than 1, and I have to dwell on that a bit more to say for sure, from a mathematical standpoint, that you can't have a number greater than 1 in terms of the way it's actually modeled in the plant.

So for the moment, I would just simply leave it at that
that, the values that have been used in the impact estimates that have been made in the Jnauary '77 report for eggs at Indian Point are 1 in 1974, and a number less than 2.5 in 1975.

DR. DAIBER: Is there any evidence that there are actually striped bass spawning in the vicinity of the intake embayment?

WITNESS LAWLER: I pass to either Dr. May or Dr. O'Conner as to whether anyone's ever observed that. I've never been informed of anyone's observing that.

WITNESS MAY: It's my impression that the peaks of eggs occur in that vicinity. I would have to refer back. But

the peaks that I recall are much further upriver. I have no reason to believe that you have major spawning in that area. Of course, eggs are found in that area. But the evidence is that it's further up,beyond Bear Mountain Bridge up into the Cornwall-Newburgh Bay area up there, and then sen farther than that.

BY MR. LEWIS:

Q Dr. O'Conner -- or Dr. McFadden, if he chose to comment -- do you have any opinion as to what biological factors explain the resultant values, on the order of 3.8?

(Pause.)

A (Witness O'Conner). I would not care to hypothesize on what biological factors might dtermine that. I would rather wait for more intensive sampling before going into that.

Q Would that be your opinion, Dr.McFadden? Or can you at this time -- do you have any opinion at this time as to what might cause --

A (Witness McFadden). I have no opinion based on data. It would be possible to contrive some hypothetical explanations, but I wouldn't feel that they'd have any particular validity.

Q All right.

Let me ask Dr. Lawler -- let me ask you one more question, mostly in thevvein of clarification. I believe you stated in your testimony that the table in your testimony -- let me find it.

(Pause.)

Basically, I guess I had reference to -- well, let's look at table F-3 on page 45. Now, was it your testimony, Dr. Lawler, that your figures, under the 1975 values, do not include the NYU data in OT- 13, the addenda to the 1973 report. Was that what you had testified to?

A (Witness Lawler). In table F-3? Is that what you're referring to?

Q Yes.

A Well, my testimony is that the data in table F-3 do not contain the egg data taken at the Indian Point plant. They do contain the river data. That was based on the river data; it says so right in the footnote on F-1 and F-2.

Q RIght. And we're looking at the column that is labeled, "1975", in particular, not at your statement.

A Yes. Again, 1975 is simply a reference to the report.

Q THe date of the report?

A THese data refer to 1973 data.

Q 1973 data in a report that was issued in 1975?

A Right.

Q But the 1975 report does not include the 1973 egg density data.

A At the Indian Point plant, right.

Q That was not available to you at the time that you --

A I indicated to you earlier that all of these computations were made by our firm in the spring and the summer of 1974, at which time the data was not available to us.

Q But you did testify that the river-wide data was available to you. Is that correct?

A That's correct.

Q But not the egg density data?

A That's correct.

Q In other words, apparently, this data came in in distinct batches. Is that -- you know, I'm not asking you to recall; I'm not asking for exact recall of events that took place two years ago. But I'm a little bit puzzled as to how you were able to use the river-wide data in the 1973 NYU report, but you were not able to use the egg density data.

And I'm not asking for total recall of exactly what came in when. But --

MR. TROSTEN: Are you asking for the timing of when the data became available? That's really what the question is?

MR. LEWIS: Yes.

MR.TROSTEN: All right.

Well, perhaps between Dr. Lawler and Dr. O'Conner, we can respond to that.

(Pause.)

Mr. Lewis, if you wish, we'll try to make a stab at rexonstructing the course of events in the fall of '73 through

the fall of '74, but the fact is, we don't remember exactly what the sequence of events is now. I don't know how much detail you need.

MR. LEWIS: Well, I don't need a tremendous amount of detail. I think that I tried to characterize what it is I'm looking for, and perhaps you could take a stab at it.

(Pause.)

WITNESS LAWLER: Mr. Lewis, the only thing that I could offer or add to this is that, to the best of my recollection, there was clearly some concern with respect to the high values that were obtained in the plant in the intake. And I would say that, before the data from the plants were released by NYU, you know, a really hard look was made at this data, particularly from the biological standpoint; you know, can you justify numbers substantially larger than one?

So, on the other hand, in the spring and summer of '74, we simply had to have some information, and make some estimates of what was taking place in the river as a whole, not simply the one plant, and this was done by taking the data that was available -- which was the river data.

That's about the best I can do to answer your question. I would like to add one other thought on this whole question of biological signifcance, and Dr. Daiber's suggestion that has there actually been any spawning observed in the vicinity of the plant. We really don't have an answer to the

actual observation this morning at the Indian Point plant. But many of these data that do have high values overall are the results of extremely high values on one or two days. And it's conceivable to me that a single female, because of the enormously large number of eggs, if she's right in the vicinity of the intake, could be the explanation of some of these very high values. Because the values we're reporting are averaged over the entire spawning period. If you go back and look very carefully at the data, you tend to find you have some individual values that are very high, and other values where there's no spawning at all.

DR. DAIBER: Is it also conceivable, as a result of the flux of the ebb and flood of the tide, and the general hydrography of the system, and the general bottom topography, that you could have some concentration of planktonic organisms? Do you have any evidence in terms of zooplankton or neomysis (phonetic), or anything else that might be suspended in the water column that would suggest a concentration in a particular area, that might be a very transitory phenomenon?

WITNESS O'CONNER: We have data like that, Dr. Daiber. But unfortunatley, I wouldn't call those data comparable with the egg situation, because the gametophyte and neomysis situation is basically one where we have a vertical migration from the mud-water interface, which is probably the peaks of abundance during the dusk and dawn periods in the river.

We certainly do observe floods of eggs. In 1975, for example, on one occasion, we had a collection which comprised in excess of 90 percent of the eggs collected for that year, which tremendously affected the average concentration during the egg season. Unfortunately, there haven't been sufficient data which are time-coincident between the plant and the river for a thorough statistical analysis of this particular phenomenon. It is not one of eggs passing by the plant and then coming by again to give us successive peaks. It's simply a matter of the sudden appearance and sdisappearance of the life history stage.

WITNESS MC FADDEN: One of the explanations that we have thought about, and are exploring it, is, as you suggested the possibility that there might be areas of concentrations of eggs which would be periodically presented to the plant intake by something like tidal flux. It would be necessary for that phenomenon to coincide in some way with the concentration of our sampling effort in order for that kind of f-factor number that we were observing here to arise; that is the type of possibility, one example of the kind of possibilities, that we are examining; one of the possible explanations.

DR. DAIBER: All right.

BY MR. LEWIS:

Q Let me return the panel's attention to page 33 of the December 7 testimony, table E-1. I'm particularly interested

in the footnote B, which discusses the fact that the values -- well, the corrected value, I believe, which the footnote B specifically refers to, is a value of 0.38, as corrected by the panel orally on the first-hand hearing. And it states that corrected, that that value is corrected for a differential net mortality between intake and discharge. The uncorrected value is 0.73.

Let me ask Dr. Lawler; did you use the NYU data on net mortality in calculating this correction factor?

A (Witness Lawler). Yes, sir, I did. Specifically, it's the data in the table -- I need the exhibit -- Exhibit number 14, table 3.

Q Dr. O'Conner, do you have an opinion as to the correction that is -- do you agree with the correction values used in footnote B, which, as I understand it, is from an uncorrected value of 0.73 to a corrected value of 0.38?

A (Witness O'Conner). I went over with Dr. Lawler the method which he used to arrive at the value of 0.38, and I am in agreement with his mode of calculation of that value, and his utilization of our data from that mortality study.

(Pause.)

MR. LEWIS: Well, I believe my cross examination is completed.

CHAIRMAN JENSCH: Any further questions?

MR. SHEMIN: Yes, I have one.

BY MR. SHEMIN:

Q Exhibit OT-13 -- there's a statement made I'd like you to clarify for me, Dr. Lawler. You stated you couldn't use the juvenile data to -- I think that they were too large to make it through the screens during a portion of the period involved.

In this Exhibit, on page 35, at the bottom, the last sentence, you're discussing the data in tables 17, 18, 19 and 20, before it states, "The juveniles were present in numbers too low for meaningful comparison during daylight hours."

MR. TROSTEN: What page are you reading from?

MR. SHEMIN: 35.

BY MR. SHEMIN:

Q "Juveniles were present in numbers too low for meaningful comparison during daylight hours" -- tables 17 and 18 -- "but were more abundant in the intakes in the river stations at night." -- tables 19 and 20. And if you look at tables 19 and 20, in fact, you notice that during the daytime, they list none as, I presume, the statistical difference, based on the factthat the numbers were too low. But for the nighttime, they do , in fact, list the intake as being greater than the river concentration.

Does this report, in your opinion, conclude that the data is sufficiently meaningful to determine that the concentration in the plant intake from juveniles at night was greater than

the concentration in the river at night?

A (Witness Lawler). Well, as I thought I pointed out the report indicates that the period over which the juvniles had been observed, from June 12 to August 21, and as far as the period of entrainable vulnerability of juveniles is concerned, that period is normally in the first month of the two-month period, or less than the first month.

Q So the juveniles would be too big to get inside the plant station?

A That's correct.

Q So, to turn Dr. McFadden's earlier statement on its head, if anything that would bias the concentration inside the plant low, such organisms that earlier might have made it through the screens would not now be making it inside the plant. Is that correct?

A I'm not quite sure what your reference to Dr. McFadden's statement is.

Q You responded to Mr. Lewis earlier in discussing the biases inherent in the experiment, the lack of biological reality of the situation, as implying that the differences, if anything -- if you could trace it to a possible cause, and perhaps a net problem -- the error, if anything, was in over-stating the concentrations in the plant. That was the suggestion earlier.

The suggestion here is, to the extent that you have

said that these numbers cannot be used, because by the time the samples were taken, juveniles were too big to make it into the plant to be counted in the concentration -- to that extent this would be biased low, as far as plant concentration is measured. Isn't that true?

A. I don't follow your point at all.

Q. Didn't you say that the reason you couldn't use this data was because during the latter period of the sampling, juveniles were not entrainable? They were too big.

A. That's correct.

Q. Why is that relevant? What's the significance of the fact that they're not entrainable in the content of this experiment?

A. I don't know what—

Q. I'm asking you why it's relevant.

A. My comment was directed at our use of the NMU data, and any other data, for that matter, to compute the entrainment f-factors, if you will, for the four life stages that have been characterized as being vulnerable to entrainment, okay? And the four life stages that have been characterized as being vulnerable to entrainment include what we have termed juvenile ls, or very early juveniles, which by and large are considered to be vulnerable to the plant if they're vulnerable at all.

And the suggestion I made earlier yesterday, and the day

before, that the whole question of the extent of juvenile vulnerability is undergoing a re-examination, based on the prior ways of looking at this -- we cut the juvenile period off well before August 21; that is to say, by August 21, you're dealing with juveniles that are not entrainable.

Q I understand what you're saying.

A So therefore, they're not involved in the computation of any f-factor.

Q I understand that. However, to the extent that one is trying to determine -- putting theories aside, one is trying to determine a ratio of the concentration of any organism in the plant, past the screens, inside the plant intake area; the concentration of that organism in the river cross-section. Putting aside some prior or subsequent hypothesis that we're not going to consider those entrainable, just looking at an organism -- at something called a juvenile, as this report calls those organisms -- if one starts with the idea that during this period, some of the organisms are not going to make it into the plant because they're not going to make it through the screens, which is what we're talking about, isn't it? Isn't that what you're saying upsets using this data?

A Well, no. You're assuming they're not going to make it into the plant because they haven't passed the screen. I'm not necessarily assuming that. I'm assuming that they're not in the plant, in any event, on the screen or anywhere else.

Q Is there any way of getting in the plant without going through the screen?

A You don't have to come into the vicinity of the plant in the first place.

Q But you can't get in the plant without going through the screen?

A Well, if you're a fish, I suppose that's true.

(Laughter.)

Q Okay.

To the extent that the only reason you're not going in the plant is because you're too big to make it through the screens, that is an isolatable phenomenon one can discuss, isn't it? But for your size, you would have been sucked into the plant. Is that a concept which you can accept?

A No, that's the whole point. You're making the assumption that the fish in the river are being pulled into the plant, and I'm not --

Q I'm making the assumption that if you had an organism that was of a certain size, smaller than the mesh of the screen, and that was right in front of the plant --

A But you didn't say that.

Q I thought it was implicit. And it would have gotten sucked into the plant. It turns out it wasn't sucked into the plant because it was just too big to make it through the screens. Is that phenomenon isolatable from everything else, assuming all

other things equal, and you can just say, size itself can result in an organism's not getting into the plant, whereas if it were smaller, it would make it into the plant?

A For those organisms that you can presume are lined up in front of the screen, let's say one foot from the screen -- well, let's say one inch from the screen --

Q All right.

To the extent that we're trying to derive a ratio based on empirical data -- not on hypotheses of what goes in and doesn't go in, or where it's located, but on actual data and sampling, we're trying to determine now -- this is what we're starting with -- the ratio of what is actually found in the plant to what is actually found in the cross-section; if we're just working with actuality and ratios, does any hypothesis as to what might or might not be happening have anything to do with your actual empirical data ratio?

(Pause.)

A Well, you've got all sorts of hypotheses.

CHAIRMAN JENSCH: Could you answer yes or no? I think it will help it along. I think you're getting away from the question sometimes, because you give an explanation that he's not asking for.

WITNESS LAWLER: I'm not really sure I follow his point. But if I understand it correctly, he asked me, is there any connection whatsoever between your empirical evidence -- is

that the word you want to use?

Q Let me simplify.

When one takes these data, and just takes a ratio of the plant intake to the cross-section at the plant location, just takes the data,counts them up, gets the data, whatever -- makes a ratio — is one doing anything other than taking actual numbers from samples and forming a ratio out of the results?

A No.

Q Okay.

Now, in that situation, if the numerator was a given number,as found in the data in this situation, and the size of the organisms during the period when you were collecting those was such that some of those organisms were not making it into the plant, because they were too big -- an isolatable phenonmenon, you agree, that could be isolated -- if that's the case, then does that phenomenon do anything other than bias low the number of organisms that, but for that phenomenon, you would have found inside the plant intake?

A Mr. Shemin, if you're saying to me, would I have found more organisms in the plant --

Q If you took the screen away?

A If I, one, have the fish in front of the screen; two, have them subject to the plant flow; three, pull the screen up; and four, can catch them in the plant, would I get more fish than I caught? Well, the answer is yes.

(Pause.)

Q We'll cover this in a more important setting, I think. I'm not going to pursue it for the moment.

Let me take another approach on something else. Were you aware of a discussion that the staff at some point wanted a document -- and since I can't locate it now, maybe you'd be good enough to remember it -- at some point, the staff, in discussing a dispute they had with you concerning your designation of the zone of withdrawal, referred to in here, I think, as the intake quadrant -- their assertion that it underestimated the actual zone, because you placed too much reliance on the upper quadrant -- do you remember a discussion by them that, inasmuch as you multiplied f_1 times f_2, and since that same factor is in the numerator in one instance and the denominator in the other instance, to a certain extent, as long as that was done, they canceled each other out, so it really wasn't a problem, even though it was a theoretical dispute?

A That's correct.

Q Now, if I could find the page --

(Pause.)

MR. TROSTEN: Wasn't this discussion in the Indian Point 2 extension filing of the environmental statement, Mr. Shemin, or in some earlier document that you're referring to?

MR. SHEMIN: Yes.

(Laughter.)

MR. TROSTEN: Which earlier document was it?

MR. SHEMIN: As you well know, if I had been able to find it in the rummaging you may have noticed in the last minutes, or if I had been able to recall offhand, I would have in fact made specific references.

Fortunately, Dr. Lawler recalled the reference, and I think he understands very well what I'm talking about. That was just the basic assumption; I'm not going to go into that at this point.

MR. TROSTEN: It's not in the Indian Point 2 extension?

MR. SHEMIN: If that was easier to look at -- I didn't see it, but it may be there. I can't say anything as to whether it's in the FES for Indian Point 3, although I think that's where it is.

WITNESS LAWLER: Well, to the best of my recollection, the question came up in the proceedings before the Federal Power Commission. I'm fairly certain that that's when that whole discussion was had.

BY MR. SHEMIN:

Q I saw it within the last month. Don't go back to that unless it's absolutely necessary. It's elsewhere.

But, putting that aside, in effect, as long as what's sauce for the goose is gravy for the gander, or whatever example you use, as long as you use it in the numerator of the portion

your f factors, and in the denominator of another portion, it cancels itself out.

However, I wanted to look at your f_1 and f_2 tables on pages 43 and 44. Now, the suggestion of the staff was that the intake quadrant number was a low number, lower than it should have been. And that situation, what that would tend to do would be to understate f_1 and overstate f_2. In other words, you would have a lower f_1 than they thought was justified and a higher f_2 than they thought was justified, according to that phenomenon. But it would cancel itself out.

Now, looking at these two tables for f_1, where the average you would get from your methodology is lower than they would like, and looking at Indian Point, you've got all the numbers in there. You've got that half of the bias. Then you look at f_2 where, in effect, we're going to get the benefit of having that in a disadvantage. But all of a sudden, when you look at the eggs and the juveniles, for instance, you don't use the data anymore. We've got 1.0 assumed.

So that the benefit of the bias is lost. Now, would you agree to the extent that they quarreled with the intake quadrant concentration methodology, but were willing to put it aside because it canceled itself out, that the way these two tables are constructed, the problem they found is back again, at least at this point with these tables. Is that correct?

A Well, that's true, Mr. SHemin. I established quite

clearly a few moments ago that given the more complete data, that the appropriate way of handling the data would be to use the intake concentrations or the plant concentrations.

CHAIRMAN JENSCH: Will you keep your voice up?

WITNESS LAWLER: Would be to use the plant concentrations for the numerator, if you will, and the plant concentrations for the denominator, which would avoid the problem.

BY MR. SHEMIN:

Q So they're f_1, in effect?

A Right. Secondly, although you weren't here yesterday, I did indicate that the findings of the hydraulic model study on the question of where the water comes from do show that more of the water comes from the lower layer than we had originally anticipated. And because of that factor, the whole question of how you define the f_1 has been revised.

CHAIRMAN JENSCH: Has been what?

WITNESS LAWLER: Has been revised. We do not simply limit it to the upper quadrant, but we apply it to both the near-field quadrants, and the upper layer as well as the lower.

BY MR. SHEMIN:

Q When was that revision made?

A That revision has been made in the results that have been presented in the January '77 report.

Q Are they reflected in these tables?

A They are not. I think I made that fairly clear.

Q Why is there enough data for eggs and juvenile f-factors in table f_2 -- excuse me; why is there not enough for eggs and juveniles, but enough for larvae?

A I think I commented on the eggs.

Q I understand the problem. You've commented on both the eggs and juveniles. The eggs were just so high that there had to be a problem; the juveniles, there either wasn't enough data, or this other problem that you raised in terms of the length of the cycle in the larvae.

You had neither of those problems, is that it?

A Well, the juveniles, to the best of my knowledge, there were simply not enough numbers during the period of entrainment vulnerability to make any judgment as to what the number should be. It's precisely that that has prompted us to revise the whole question of juvenile vulnerability. We simply do not find the juveniles in the plants. If you look through footnotes in these various places, you're constantly forced to say, juveniles;assume such and such for lack of data. Or it says, well, this is the number we got for the number of juveniles, but it only regards the number of juveniles at intakes between the discharges.

You just can't work with that information. But what it all says is, that we have very few juveniles coming into the plant.

Q In fact, the important area that that discusses --

doesn't it also say that very few are even found in transit?

A. That's correct.

MR. SHEMIN: I don't have any more questions.

CHAIRMAN JENSCH: I wonder if I could just go back to Dr.McFadden. He's the one that gave us the statement that was biased on the high side, and bearing in mind this interrogation between Mr. Shemin and Dr. Lawler, would you care to revise your statement, bearing in mind the thing was measured in August, orsomething? Your statement was a little optimistic, was it not?

WITNESS MC FADDEN: No, sir. My statement referred only to eggs. This latest discussion refers only to juveniles.

CHAIRMAN JENSCH: Yes. I'm back to the point where I thought that Dr. Lawler didn't quite understand the questioning that was going on. I don't want to go through it step by step again, but to go back -- forget thejuveniles, and go back to the eggs. Will you pick up the bias story with Dr. McFadden, Mr. Shemin?

MR. SHEMIN: I'm not sure that the bias problem that I referred to with Dr. Lawler is applicable. It's a different bias with the eggs than it is with the juveniles.

CHAIRMAN JENSCH: I understand.

MR. SHEMIN: There were two different problems in essence, I think. The responses with the eggs were that the numbers just couldn't be real. They were just too high to be

real. And for whatever reason, I think they probably feel it has to do with differential sampling efficiency of the nets. But for whatever reason, he felt that they just had to be disregarded, because they weren't real, unless there was some vast spawning in the area.

I have a problem with the juveniles. Dr. Lawler's statement -- I think I understand the extra complexity. In effect, what he's doing is plugging in one of their assumptions and refusing to unplug it for the purpose of analysis. And that's their prerogative. And that assumption is that there are differences between juvenile 1s and juvenile 2s, for instance, as they use them, which lead them to just not be willling to consider entrainable data about juvenile 2s relevant to juvenile 1s, even if there's a bias in favor of their position.

CHAIRMAN JENSCH: Well, let me go back to Dr. Lawler.

In view of the fact that you revised this f_1 and f_2 in your January report, you don't expect much reliance upon f_1 and f_2 in this proceeding, do you?

(Laughter.)

CHAIRMAN JENSCH: Well, you recognize that it's an error, because you've revised it, have you not?

WITNESS LAWLER: Well, I wouldn't necessarily say it's an error. But it certainly uses less data than the data that are available at this point in time.

CHAIRMAN JENSCH: And if you were recommending a

consideration of the subject reflected by f_1 and f_2, you would recommend that which will be shown in your January 1977 report, would you not?

WITNESS LAWLER: That's correct.

CHAIRMAN JENSCH: And therefore, you wouldn't expect us to rely upon f_1 and f_2 here in this proceeding, would you, since your recommendation would be otherwise?

WITNESS LAWLER: Well, I think, Mr. Chairman, that I've discussed the findings for 1974 and 1975, as well as -- and tried to relate the findings of 1973, as reported there and in table F-3, to what we're now finding in the '74 and '75 data.

CHAIRMAN JENSCH: Well, we'll take it up with your counsel.

The witness has revised the document in reference to something else other than to present it here. We'll have to consider --

MR. TROSTEN: Mr. Chairman, I'm afraid that's a serious misstatement of what our evidence is.

CHAIRMAN JENSCH: Well, it would be good if you would tell us, then. If the man has revised these two tables, F-1 and F-2, because he recognizes that he didn't have some data that he's utilizing for the revision, you wouldn't expect us to say, well, since he brought it in here, we'd better take this. It's the only thing we have.

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MR. TROSTEN: No, Mr. Chairman. The purpose of this proceeding, of course, as the Chairman knows, is to enable us to have an opportunity to present all of the new data to the Commission for its consideration. We have presented all of this information, and we are most certainly asking the Commission to rely upon the data that we now have, in order that you may review what we now have, and to determine that there is an adequate reason to allow the presentation of the additional data.

So, as I say, not asking you to rely on what we have presented for the purposes of this proceeding just sort of turns the proceeding on its head.

CHAIRMAN JENSCH: Well, you may ask us to rely upon it. But you don't expect that we're going to rely upon something that he's recognized has error. And he's made a revision, and you say you want us to have all the data that's pertinent to this matter. I suupose you'd want us to have the January 1977 report, do you not?

MR. TROSTEN: We ask you to rely upon all the data which we are presenting in this proceeding. We are not offering that evidence in this proceding, of course, since we don't have it: the January 1977 report.

CHAIRMAN JENSCH: I think we're up to you on that, all right.

WITNESS LAWLER: Mr. Chairman, I'd like to add two

comments. One, rather than use the words, "these data are in error," I'd much prefer to use the word --

CHAIRMAN JENSCH: These calculations are in error.

(Laughter.)

WITNESS LAWLER: No, no, no; not that these calculations are in error at all. If one uses the data that is now advanced, you obtain high values. So the question of the biological significance of these numbers has been brought out. More importantly, what I've said to the Board is that the use of the higher ratios which I articulated a few moments ago does not signficantly change the estimates of impact that have been offered.

CHAIRMAN JENSCH: Significance; that always bothers us.

MR. SHEMIN: Is that just for eggs, the statement that you just made, Dr. Lawler?

WITNESS LAWLER: NO. My statement is, [illegible] of the changes will not result in a significant change of [illegible] of impact. And by significant, I would say not more than 1 percent.

MR. SHEMIN: Is that including the use of your compensation function in your model?

WITNESS LAWLER: Yes, sir, it is.

MR. SHEMIN: What's the sensitivity of the changes if you were to take the compensation function out of your model?

WITNESS LAWLER: I can't give you an answer to that at this moment.

MR. SHEMIN: Did you not testify earlier -- yesterday, I think it was -- in response to someone else's question, that the sensitivity of your results to changes in f-factors was greater if one removed the compensation function?

WITNESS LAWLER: That's correct. But I can't say to you, however, that the composite f-factor, all plants, all stages, in both years -- for 1974-'75 -- using the data that we now have available that I referred to, computes to 0.17. The composite f-factor that you compute using table F-3 computes to 0.24, so my statement is that the composite f-factor used in the McFadden Report of January 1977, the January 1977 report, is a number that is slightly lower than the number that appears or could be computed directly from the data in the table. Yes, that's correct.

MR. SHEMIN: If we wait five more years, is the plant going to be turning out striped bass?

WITNESS LAWLER: Well, some suggestion was made to that effect, yes.

CHAIMRAN JENSCH: Has all interrogation been completed?

MS. CHASIS: I have one point of clarification.

Mr. O'Conner had indicated earlier that the abundance data for '73, which appears in the Exhibit OT-13, had previously

been included in the 1973 progress report, and I did not find it.

MR. TROSTEN: He did not say the 1973.

WITNESS O'CONNER: Not in the 1973 progress report. But they have been released in, I believe it was December of 1974; been released publicly. Is that not correct?

MS. CHASIS: What document, please?

WITNESS MARCELLUS: In reference to the addendum material?

MS. CHASIS: Yes, abundance of life stages.

WITNESS MARCELLUS: The document was distributed to the parties in December of 1974. I cannot recall the date.

MS. CHASIS: And what document?

WITNESS MARCELLUS: In the document with the, if I recall correctly, these two items which you're talking about, like frequency analysis and addendum analysis. They were two separate documents, one of which contained calculation of abundance of the four life history stages.

MS. CHASIS: I'd appreciate your identifying it specifically at some later point, if you can.

MR. TROSTEN: Will you accept identification from counsel at a later time? I'll have to confer with Mr. Sack on this point.

MS. CHASIS: Yes. I'd like it on the record.

MR. TROSTEN: All right, fine.

CHAIRMAN JENSCH: Mr. King?

MR. KING: Mr. Chairman, I'd like to follow up one line of questions that Dr.Daiber put before the panel, specifically with regard to the higher values for the eggs.

Dr. Daiber asked the panel to consider whether this might be the result of tidal flows, and I was wondering, Dr. McFadden, whether there's any way you can determine, based upon the evidence that you have, whether in fact the effect of tidal flows might have contributed to the high values for eggs.

WITNESS MC FADDEN: There are possibilities of being able to discern that from the existing data. Our examination isn't yet complete. There would also be possibilities of collecting new data in a somewhat different pattern from the past, in a way that would give us insight into the possibility of that type of explanation.

MR. KING: So, all there is is the possibility of an explanation. But you cannot conclude now thatyou can explain it, can explain the effect of tidal flows?

WITNESS MC FADDEN: That's correct, sir.

MR. KING: No further questions.

CHAIRMAN JENSCH: Any redirect?

MR. TROSTEN: We have no redirect, Mr. Chairman.

CHAIRMAN JENSCH: Well, maybe, then this is a convenient time to proceed with the examination. Or do you want to proceed with Dr. McFadden?

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MR. TROSTEN: I would like to proceed with redirect examination of Dr. McFadden, if we could have a five-minute recess.

CHAIRMAN JENSCH: All right. Synchronize a bit here.

At this time, let us recess, to reconvene in this room at 11:15.

(A brief recess was taken.)

CHAIRMAN JENSCH: Please come to order.

Is the Licensee ready to proceed?

MR. TROSTEN: If I can find my witness, Mr. Chairman.

(Pause.)

CHAIRMAN JENSCH: Will you proceed, Licensee's counsel?

REDIRECT EXAMINATION

BY MR. TROSTEN:

Q Dr. McFadden, why did Con Edison study predation by other fish instead of striped bass?

A (Witness McFadden). Some time ago, the staff suggested the value of a study of predation on striped bass in relationship to the phenomenon of compensation. And we were in agreement with that suggestion.

Q Would you please differentiate the elements ofthe bluefish predation study carried out?

A Yes, sir. The structure of the study, and the way that the results are stacked up, is as follows.

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First, upon the recommendation by the staff, we did undertake a predation study. The first actual step in that study was to carry out stomach analyses of potential predators and in the process of that, the two years' data which were cited in the testimony were collected, which showed that bluefish did eat striped bass.

A completely separate analysis, based upon a different set of data, explored the correlation between an index of striped bass abundance and an index of the abundance of potential predators; in this case, bluefish, and yearling and older striped bass. And that is the predator index referred to in the testimony as reflecting a negative correlation between striped bass abundance and the abundance of predators.

The largest component of the predation index is made up of bluefish. And in fact, if bluefish are analyzed separately, if the abundance of bluefish is analyzed separately as an index of predator abundance, a significant negative relationship between young striped bass abundance and the abundance of the bluefish exists.

Now, the way that this is expressed in the testimony is -- possibly could be misleading. And I want to refer to page 14, line 1, where this correlation is discussed. The first line on page 14 of the testimony of Campbell, Lawler, Marcellus, May, and McFadden; in the last two words of that first line, that predation by bluefish and yearling and older striped bass,

it would be more accurate to say, instead of "predation by," "abundance of." Because the factor actually measured is not actual predation by the species listed -- namely, bluefish and yearling and older striped bass -- but rather the abundance of those species. And I think that that choice of wording may have contributed to some confusion yesterday when the data were cross examined on.

Similarly, on page 48 in the second full paragraph, in line 5, there is again reference to a predator index dominated by bluefish predation. It would be more precise and understandable if that line read, "a predator index dominated by bluefish abundance." And on the same page, page 48 --

DR. DAIBER: Pardon me, Dr. McFadden. You would then strike out the word, "predation?"

WITNESS MC FADDEN: That's right, sir.

DR. DAIBER: Thank you.

WITNESS MC FADDEN: That should read, "bluefish abundance."

The same page, on line 8, the sentence that begins there reads, "this predation factor." And it would be better if that were to read, "this predator abundance factor." Those changes would eliminate possible misinterpretations, and the possibility of confusion between this predator abundance correlation analysis and the demonstration of actual predation by the examination of the stomach contents of the bluefish

MR. SHEMIN: How about the last word on the next to the last line? Should we change it from "predation" to "abundance?"

WITNESS MC FADDEN: No, sir. I'll comment on that.

So, the structure of the presentation of the results, as outlined so far, is first, the food study demonstrating that bluefish eat striped bass. Second, a correlation study using different data that demonstrate that striped bass abundance is negatively correlated with bluefish abundance.

The next step is to draw an inference, and that is done on page 14.

(Pause.)

In line 8, the inference is that a large bluefish population would probably reduce juvenile striped bass abundance through predation. The word "probably" is used by choice, indicating that that is an inference drawn from the two previous stages of the bluefish predation study; namely, the food study and the correlation study.

A second inference has been drawn, and is set forth on page 48, relating the bluefish predation influence to the phenomenon of compensation. And on the next to last line of page 48, it states, beginning after the comma, indicating that bluefish predation may be a density-dependent regulatory mechanism. Again, the choice of the words "may be" is deliberate, indicating that this is an inference based upon the preceeding

steps in the bluefish predation analysis. Absolute proof that bluefish predation is a density-dependent mechanism would require the demonstration that the rate of predation by bluefish was higher when striped bass density was higher, and we do not have data to sustain that point.

That is the reason that the inference is qualified by the words, "may be."

The NRC staff, in their original suggestion about the study of predation, implied a relevance to the phenomenon of compensation. We agree with them in that position. Predation is usually taken to be compensatory in nature.

BY MR. TROSTEN:

Q Dr. McFadden, to the extent that you have not already done so, would you relate the findings on bluefish predation to compensation of striped bass?

A (WItness McFadden). Yes, sir.

IN examining different possible compensatory mechanisms operating in the striped bass population in the Hudson River, we have attempted to rate two types of data. One is data that conclusively demonstrates the operation of a specific mechanism. An example of that would be the negative correlation between the growth of young striped bass and their density.

The second, and most compelling,class of evidence relating to compensatory phenomena is the demonstration of a phenomenon that could be, or may be, compensatory in nature

but for which we haven't arrived at the last stage of formal proof. And an example of that class would be the bluefish predation study.

Q Dr. McFadden, I have a series of questions I would like to ask you concerning the reliability of the long time series data.

Are long-time series biological data, such as some index of abundance for a fish stock, important in fishery studies?

A Yes, sir. Data of that kind enable us to determine long-term trends, or fluctuations in abundance of a particular species, and for certain analyses are required. An example of that might be the necessary number of observations on an important relationship, like that between the abundance of spawning stock, and the abundance of recruits surviving from a particular spawner. Normally, it takes a long series of years of observation to accumulate enough values for the fish stock, at a wide enough range of population densities, to be able to demonstrate a phenomenon of that kind. And those are both examples of the kinds of data that could be useful. To be useful, they must be acquired through a long-time series of observations.

Q Has Con Edison used such time series data in their Hudson River striped bass studies?

A Yes, sir. The two most significant examples are

the indices of abundance reconstructed from data such as the seining collections, and the index of adult stock abundance, reconstructed from the commercial fishery catch effort data.

Q Certain types of problems generally afflict data of these types, not just in the Hudson River, of course, but in fishery studies in general.

A Yes. Long-time series of data are universally afflicted with problems caused by the inevitable changes in both internal factors within the data and external factors within the environment that would occur over long periods of time. An example of the former would be in fisheries data, the change over long historical periods: in the power systems propelling commercial fishing boats, the types of twine that are used to construct fishing nets, the recent innovations in technology, such as echo-sounding gear, which are used to actually locate schools of fish; and, to take one of the most important examples of fishery data in existence, data from the North Atlantic trawl fisheries, data which have been accumulated since the late 1980s, there have been a long series of changes in the technology through which fish are caught.

And yet, the effort data collected from that fishery have been maintained. And periodically, it's been necessary to devise some means of correcting, say, so that you could equate the effort generated by a modern trawler with the effort generated, say, 50 years ago by what now would be an antiquated trawling

vessel.

And so, those kinds of problems normally afflict data of this kind. Another example in a long-time series of data would be the possibility of shifts in climatic patterns. The longer the series of data, the more likely you are to have data extend through a period of significant climatic change, but the climatic change may be reflected in biological parameters along with other things you're studying, such as changes in fishing effort or other sources of exploitation.

There are also the usual errors of transcription in the data, errors of measurement of either biological or fishermen's parameters, and these kinds of problems are common through the entire series of fishery data. The value of the long records typically outweighs the limitations and flaws in the data, and it has been a common experience in fishery science that, with appropriate interpretation and correction of the data, it's possible to make very important use of these types of data in management of fish stocks.

The reason for wanting to emphasize this is, some of the most important long series of data relating to our assessment of qualified impact on the Hudson River stock are of this long-term series type. And the problems that are encountered in the Hudson, in my opinion, are no different generally speaking, and - no more severe, than those commonly encountered in data of this type in their use in fishery science.

Q Dr. McFadden, in referring to the data from the North Atlantic trawler fisheries, you referred to collection of data from the late 1980s. Did you mean the late 1930s?

A I'm sorry. I meant the late 1800s was the beginning point, yes, sir.

Q Do these problems that you've been referring to with the use of long-time series data invalidate the use of such data for biological analysis?

A No, these problems don't invalidate the use of the data. They impose certain limitations on the data's interpretation and application.

There are three general ways that these problems inherent in the data can express their effects. One is if the causes of the aberrations in the data operate randomly, they don't bias the data, but they create more scatter; that is, the relationship between, say, fishing effort and a catch of fish might vary for a good many reasons other than just changes in the size of the fish population. For example, errors in measurement, or differences in the efficiency of the fishermen's effort due to changing gear or climatic effects.

But if those things operate randomly, then you simply have data which areless precise, but not less accurate.

A second type of problem would be one in which a consistent bias exists in the data -- for example, if the estimate of catch by a fishery is always low by a constant

fraction, then that's a consistent bias which would not invalidate the year-to-year comparisons; that is, relatively speaking, changes from year to year would still be accurately reflected.

The third class of problem is the one that is most damaging, insofar as the utility of the data would be concerned. That would be a case where, during one period of years in the time series, a particular interfering phenomenon operated, and during some subsequent period of years, that phenomenon no longer operated. So that the data might be high for a ten-year period, and then low for a subsequent ten-year period, as the result of some unmeasured variable. And that change might erroneously be attributed to one of the factors that you're studying in relation to the fishery data.

That is the most damaging type of aberration in the time series of data. If you can measure the interfering factor, if you can correct for it, if you don't know about the interfering factor or haven't measured it, then you are likely to attribute it to some cause you have measured. The effect is really due to the unmeasured factor. An example of that would be the possibility, for example, of favorable natural environmental conditions accidentally coinciding with two years of post-operational data for a power plant, in which case the accidentally favorable natural environmental conditions would partly covered up what could be a real power plant impact.

This is the kind of concern that all parties to the

Indian Point proceedings have taken cognizance of in the past, and the kind of concern that we try to handle by measuring as many of these possibly complicating natural environmental factors as we can.

Q In your opinion, Dr.McFadden, do the problems which you have described in your testimony invalidate or seriously limit the conclusions drawn by Con Edison in their Hudson River ecological studies?

A No, sir.

Q Dr. McFadden, other parties have questioned the value of the 1975 data in improving the basis for assessing the significance of operating once-through cooling systems. Can you cite some areas in which the 1975 data improved this basis?

A Yes, sir.

There are a number of very important areas basic to accurate estimation on environmental impact for which the 1975 data make a unique contribution. One is the Indian Point flume study already referred to in the testimony here, which demonstrated that a differential sampling mortality is imposed by the collecting gear between the intake samples and discharge samples in the power plant. The discovery of that phenomenon led to a major revision in our concept of and our estimates of the values for survival during the period of entrainment by the various ichthyo-plankton stages.

A second set of data specific to 1975 that are of

vital importance are the estimates of survival of icthyoplankton during the entrainment period developed for the Bowline and Reston (phonetic) plants, which demonstrated lower entrainment mortality, especially for the post yolk-sac larval stage, the most critical stage in impact estimation than the values that previously had been assumed and used in the model estimates of impact.

So, this represents a major addition to our base of data.

A third category of data dependent upon the 1975 values are the impact estimates presented in the testimony of Campbell, Lawler, Marcellus, May and McFadden in this proceeding for both the years 1974 and 1975. These estimates of impact are presented for both the Indian Point 2 and the multi-plant case. There are differences of a substantial order in the plant intake flows between the years 1974 and 1975.

These data reflect two different levels of power plant operation, hance, provide a very useful contrast in the level of impact that might be generated.

There is a second dimension to this particular set of data, these impact estimates, and it's as follows. Reflected in those data are some significant changes in the impact values from 1974 to 1975 that are not accounted for by the increase in estuarine water utilization by power plant cooling systems, and are not attributable to the f-factors used in the calculation

and hence must be a reflection, as nearly as I am able to judge, of the degree to which temporal and spatial distribution changes in young striped bass from year to year can change an estimate of power plant impact.

The reason that the change noted from 1974 to 1975 in the impact estimate cannot be attributed entirely to plant flow rates is that in some instances --

(Pause.)

-- for example, entrainment at Indian Point, the impact value changed only very slightly, to 75, even though there was a large change in cooling water usage. I interpret that to mean that the changes in spatial and temporal distribution of the icthyoplankton stages between '74 and '75 partly offset the increased impact due to the larger utilization of water in '75.

The reason why f-factor changes from year to year cannot be causing the change in impact statistics from '74 to '75 is that the same f-factor values have been used in the calculation, as is explained in the testimony. Hence, we can see from this set of data that just on the basis of changes in the temporal and spatial distribution of the icthyoplankton between the years, we can have a large change in the impact values.

(Pause.)

In the case of entrainment by all power plants operating in concert, and the data are given on page 23, an increase

of the order of approximately 40 percent between years, that means that if impact estimates are based on a single year's data, it would be possible that virtually the same conditions of power plant usage of the estuarine system a year later might give rather different impact figures, either in the direction of higher or lower figures.

Some feel for the possible magnitude of change in impact from year to year, due to changes in the biological system, is of vital importance. And it would be a major mistake to base an estimate of impact upon a single year's data.

Another important area where the '75 data contribute f-factor data, which show the changes in these withdrawal factors that took place in 1974 and 1975, and can signficantly influence the estimates of impact.

A fifth area where the 1975 data make a unique contribution is the estimate of the impact upon the tomcod population. The data required for such an estimate are not available except for the utilisation of 1975.

A sixth area where the '75 data make a unique contribution is the evaluation of survival of stock hatchery fish. The 1975 data provide more recaptures than any other year, and provide more important proof of survival for one full year after release. And in addition, they are the most important statistical basis for comparing survival of stock fish with survival of wild fish in the estuary.

A seventh area where the 1975 data make a unique contribution is that because of deficiencies in the quality of the 1973 data, we see '74 plus '75 as constituting our two good years of data from which impact can be estimated. And following normal scientific criteria for validation and repeatability of an experiment or an observation, we rely upon those two years' data as proof that we can, in fact, successfully repeat the type of impact measurement that we are now carrying out.

The eighth area where the '75 data make a unique contribution is that, compared with '74, we have the two years of post-operational data for Indian Point that we set forth in the original Indian Point 2 hearings to acquire. Unit number 2 did not go on line in time for the 1973 entrainment season, and the rate of use of estuarine water for cooling purposes increased significantly from '74 to '75. So that in order to acquire the desired two post-operational years, we must rely upon these two years, and we gain the additional dividend of a contrast in multi-plant operational levels between the two years '74 and '75.

The final area that I want to cite as an example of the signficance of the '75 data is the information on the relative contribution of the Hudson River to the mid-Atlantic striped bass fisheries data, in which both the spawning river samples and the fishery samples were collected in the year

1975.

Q Dr. McFadden, in normal scientific procedure, is proof of the repeatability of an experiment or observation considered to be of great value?

A Yes, sir. Just in terms of the basic logic and credibility of an observation or experimental procedure in science, demonstrating that you can do it a second time, producing consistent results, is a major foundational accomplishment.

Q Is it not a case that a single experiment or observation, unrepeated, is a questionable basis for drawing a scientific conclusion?

A Yes, sir. A single unrepeated, unreplicated observation is always subject to serious question as scientific evidence.

Q Did the staff's statements on page 7-7 of the final environmental statement --

(Pause.)

-- page 7-7, regarding the limited value of adding one more observation to data sets of 8 and 13 observations, apply to all data presented by the Applicant?

CHAIRMAN JENSCH: Can you give us that line, please, on page 7-7?

MR. TROSTEN: Mr. Chairman, you should read the comment entitled Page 5-1, Section 5.2, Greater or Lesser Extension of Time. There was a paragraph in which there was

a contrast drawn between various data sets.

CHAIRMAN JENSCH: And you're directing his attention to what particular sentence in that?

BY MR. TROSTEN:

Q Does the staff statement to which I have just referred, Dr. McFadden, regarding the limited value of adding one more observation to data sets of 8 and 13 observations, apply to all data presented by the Applicant?

A No, sir. And most importantly, the staff here is referring to two of our data sets where there were in one case 8 data points, and in the other case 13. We agree with the staff's application of this particular statistical point to those particular cases. But, one should clearly make the point that the statement does not apply to cases such as the '71-'73 impact estimate data, which I discussed with you in the preceding questions.

Q From a statistical point of view, Dr. McFadden, in what situation is the incremental value of one added observation greatest?

A The case in which the incremental value of one additional observation is the greatest is the simple case where you already have a single observation, and are adding a second one.

Q And in what situation is the incremental value of an added observation second most important?

A It logically follows that the second most imoprtant instance , where the second-largest value of an incremental single observation is, is where you're going from a set of two observations to a set of three.

Q If the 1973 data used for direct impact assessment are accepted as of sufficient quality, the use of 1975 data represents which of the above two incremental situations that we've described?

A In that case, adding 75 to '73 and '74 represents the second most important case, in terms of the value of a single incremental observation.

(Pause.)

Q In your testimony on pages 22 and 23, you provide impact assessments for 1974 and 1975. Which type of incremental situations does this describe?

A In the case you cite, the addition of the '75 observation is an increment of one additional observation to a single observation, that of 1974. That corresponds to the general statistical case we cited a moment ago of the maximum possible value to a single incremental observation.

MR. TROSTEN: I have no further redirect examination.

CHAIRMAN JENSCH: I don't know whether I stated this on the record before or not, but we're hopeful to go back to the courthouse this afternoon. And if you'll give me a few minutes now, they expected to have word now. And if there is word, my

thought is that maybe we would recess before the cross examination and pick it up.

What time does Dr. McFadden have to leave today?

MR. TROSTEN: He's able to stay here through the day.

CHAIRMAN JENSCH: My thought was, as long as we are planning to move, this might be a convenient time. So at this time, if you'll all select your own watch time, we'll take five minutes from whatever your watches show, and we'll recess for five minutes.

(A brief recess was taken.)

CHAIRMAN JENSCH: Please come to order.

I have just contacted the office of the administrative officer of the courts for New York, for Westchester County. And they have assured us that we have the use of the courtroom. What would be a convenient time for a recess, contemplating when we should return, and probably eat and be ready to go all afternoon? An hour and a half, or an hour?

MR. TROSTEN: An hour.

MS. CHASIS: An hour and fifteen minutes?

CHAIRMAN JENSCH: All right.

At this time, let's recess to reconvene back in the Ceremonial Courtroom, Westchester County Court House, White Plains, New York, at 1:15 p.m.

(Whereupon, at 12:00 noon, the hearing was recessed, to reconvene at 1:15 p.m., this same day.)

TAKE 3
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AFTERNOON SESSION

(1:15 p.m.)

CHAIRMAN JENSCH: Please come to order.

Dr. McFadden, will you resume the stand, please?

MR. TROSTEN: Mr. Chairman, before cross of Dr. McFadden, I would like to discuss the matter of scheduling.

CHAIRMAN JENSCH: All right.

MR. TROSTEN: In view of the hour, now, and what has to be done today, and the cross-examination we anticipate for Staff and the redirect we expect to put on tomorrow, and certainly since all of us would like to conclude this week, could we consider running late this evening and perhaps starting early in the morning?

I am really concerned that we are going to run out of time.

CHAIRMAN JENSCH: Let us do what we can. I think everyone has that effort in mind. Let's see what we can do.

We find our schedule next week is impossible.

MR. TROSTEN: It is impossible?

CHAIRMAN JENSCH: Yes.

So if we don't finish, it will be in January.

MR. TROSTEN: Okay, well, perhaps we can think about this later in the day.

CHAIRMAN JENSCH: Yes.

jrb2

Whereupon,

JAMES T. MC FADDEN

resumed the stand as a witness for Applicant and, having been first duly sworn, was examined and testified as follows:

CHAIRMAN JENSCH: Hudson River, would you care to cross?

MS. CHASIS: No additional cross.

CHAIRMAN JENSCH: Attorney General?

MR. SHEMIN: Just one or two.

CROSS-EXAMINATION

BY MR. SHEMIN:

Q. You talked about the limitations of using some certain data which may not be as good as you would have hoped over a long time span. If it can be found that that data is of such poor scientific quality that various conclusions previously made with respect to that data are without value, at that point you would decide you can't use that -- is that the type of error that would lead you to reconsider that?

A If the previous incorrect conclusions can be traced to uncorrectable flaws in the data themselves, then I think that would probably indicate one would not want to make use of the data. It would be conceivable that data would be unusable for one type of examination or conclusion, but it would be usable for some other.

jrb4

abundance. I might have cited the latter, but I do not recall.

Q Well, let me ask you this: it's my understanding that the young of the year growth data in the Hudson is essentially an eight-year data series; is that correct?

A That's my recollection.

Q Would you characterize that as a long-time series?

A No.

Of course the term "long" is a relative term; and I would say that the set of data observations in that case was sufficient; in fact, it's been demonstrated to be a sufficient number of observations to establish the relationship at the stated level of statistical reliability.

Now, if the relationship between density and growth of young striped bass were real but weaker than it appears to be, then it might take more observations, more years of observation, to be able to demonstrate it as significant.

The more powerful or precise relationship between two variables, the fewer observations are necessary to demonstrate it as a reality.

Q Now, you also testified earlier that a single unreplicated data sample, for example, one year, might well be of limited value; is that a correct statement?

jrb6

change somewhat.

And so I would say that the second year's sample, say, taken next year would almost certainly indicate results about the same as the sample at hand; and in order for the information to be most useful, most cost-effective, one should delay a fairly long number of years.

And, of course, that would mean, that delay would theinformation would not arrive in time for this proceeding.

There are some other considerations with regard to that particular type of study that are important, too. In sampling the fishery in the one year, 1975, we have in effect sampled many years, for the simple reason that the different age groups that constitute the stock represent contributions from the several contributing rivers over, say, oh, a significant degree over the past probably four or five years.

So there is a form of almost like internal replication or duplication built into that study for that reason.

The single year's data collection in the relative contribution study clearly constitutes the best available basis for understanding the relative contribution to the Mid-Atlantic stock from the Hudson River.

I would add one final thought: that is, that the relative contribution study carried out in 1955 is in a

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as to what the Staff believes or concludes.

Q Did you write the section entitled benefit-cost analysis, Section 6.4?

A Benefit Cost Balance?

Q I'm sorry, Section 6.4; it looks to me as if it starts on page 6.1?

A Yuh, the whole chapter, it's very brief.

Q Did you write that chapter?

A I wrote paragraph 6.2, 6.3, I served as an editor on 6.4-1, 6.4-2; and I believe I wrote 6.4.3, Benefit Cost Balance.

Q Dr. Geckler, I take it, then, to the extent there is any what is caled here a benefit-cost balance, in this document, that you would be the witness to whom I should direct my questions?

A Yes.

Q I take it Dr. Van Winkle did not have anything to do with that? Well, would you answer that question?

A He didn't do any of the writing; some of the information he took on environmental impacts we used.

Q In other words, Dr. Van Winkle contributed the information that described, and then you wrote; and you are responsible for the so-called benefit-cost analysis?

A That is correct.

Q Dr. Geckler, do you understand -- I realize that

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co-counsel, Mr. Sack, and Mr. Fidell, will also have questions for them. I will proceed now with these two witnesses.

CROSS-EXAMINATION

BY MR. TROSTEN:

Q Dr. Geckler, you mentioned that you were the Environmental Project Manager, and that it was your responsibility -- I believe you said to coordinate and produce the document.

Does that mean that you wrote the document?

A (Dr. Geckler) I wrote portions of it.

Q Which portions did you write?

A Many or most of Chapter 7, the comments I wrote; I wrote the summary and the conclusions; for the most part of the text itself, that is, exclusive of Chapter 7, I reviewed draft materials prepared by the Oak Ridge National Laboratory and did whatever editing and cutting down to avoid duplication that was required, without essentially changing the sense of the laboratory's language.

Q Are those the sections you wrote?

A Yes.

Q Would you point me to the benefit-cost analysis that appears in the FES?

A There is no analysis, per se.

Q You say there is no benefit-cost analysis, per se?

A Per se; there is simply a statement on page 6-2

jrb59

is a relatively qualitative point that I am trying to make that -- that we have been gaining knowledge and understanding of data about fish populations in the Hudson River, in all the components of the Hudson River ecosystem for quite a number of years.

And each new year we learn a little more, and we can imagine a graph of our understanding or knowledge on the Y-axis for years, and on the X-axis it is continuing to go up; if you plotted it for any particular issues that are of concern here, it continues to go up.

And the point I am making here is that you would not expect on most of these issues any giant discontinuity in that graph, going from one year to the other.

I think that there are some issues that perhaps don't fit this description very well; for instance, our understanding of -- or the basis for our understanding of, say, the contribution question.

I think any time you have a piece of research that is aimed at a particular question, and the results happen to come in in a particular year, you might have a fairly large jump in our understanding, or the basis for arriving at estimates on a particular point.

I think what caused me to write this, as I remember, was particularly our understanding of the young of the year population dynamics in the river, where we already

jrb60

have information from Hudson River fishery investigation studies in the last -- late 1960s, and even the 1955 study, which has been followed by numerous studies by a number of contractors since then.

We have been getting new information, but a good deal of it has been confirmatory, going to the shoal areas, eggs tending to be in the deeper part, nearer the bottom. And so it was more in this context, as I remember, I did not expect we were going to get a great burst of insight as to how things were working in the river.

BY MR. TROSTEN:

Q Would it be a fair summary of what you said Dr. Van Winkle, that you feel that whether new information, new insights, represent a quantum jump depends on the particular subject you are dealing with? New information might come in on one subject that would represent a quantum jump, and another subject, it might not represent a quantum jump, or it might represent no jump at all?

Would that be a fair summary of what you are saying? It really depends on the particular issue that you are dealing with?

A (Dr. Van Winkle.) I am going to agree with that.

Q Thank you.

MR. TROSTEN: One moment, Mr. Chairman.

(Pause)

jrb61

BY MR. TROSTEN:

Q Dr. Van Winkle, I would like to call your attention to page 23 of the testimony of December 7 by Doctors Campbell, Lawler, Marcellus, May and McFadden; and you see there the multi-plant entraining and impingement impact for the years 1974 and 1975.

Now, do you see the contrast between the entrainment multi-plant inpact and the -- excuse me.

Do you see the contrast between the 1974 entrainment multi-plant impact, and the 1975 entrainment multi-plant impact; and do you notice that there is a difference there of a 149 percent ratio there, that is, 1.13 percent and -- 1975 -- versus .76 percent in 1974.

Now, would you say that this approximately 49 percent increase in power plant impact is a significant change, numerically speaking?

CHAIRMAN JENSCH: I didn't hear that last question? Significant in relation to what?

MR. TROSTEN: I asked Dr. Van Winkle whether he considered the approximately 49 percent impact in entrainment that occurred between 1974 and 1975, that is, between 0.76 percent impact, and 1.13 percent impact, as being significant, numerically speaking.

These are the impacts we estimated.

CHAIRMAN JENSCH: Is this a theoretical question?

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MR. TROSTEN: No, no; it's a question of whether he regards this as a numerically significant difference.

CHAIRMAN JENSCH: In relation to what kind of an impact? As to indicating that there is a substantially greater amount of entrainment, damaging to the fish population?

What is the context of your "significance"?

MR. TROSTEN: My question, Mr. Chairman, is this: I guess I can say it in layman's terms; does he consider that to be real, you know, something significant, in terms of the fact that there really was something different between those two years.

That's how I was thinking.

CHAIRMAN JENSCH: I understand; go ahead. Excuse me.

WITNESS VAN WINKLE: I find it easier to answer it in those terms.

No, I don't. I don't find that to be a difference of concern.

BY MR. TROSTEN:

Q Do you think it is a real difference? Do you think you are seeing a real difference there, one that you would regard as being significant from a numerical standpoint in the sense that it is something that has a numerical significance to you?

A (Dr. Van Winkle) Again, I am hung up a bit here

jrb63

on the percent reduction scale, which is what the numbers in this table are on, versus your taking or talking terms of the percent to which the numbers in here differ from each other.

If you are going to talk about a 49 percent, or say, a 50 percent increase in impact, it very much matters where you are on the percent reduction scale.

When you are at this part of the percent reduction scale, obviously, you are in the noise level.

Q I wasn't talking about the biological significance, Doctor; I am talking about on a numerical scale, in terms of a numerical analysis.

Do you consider that this type of a difference of 149 percent relationship from one year to the other is significant, numerically?

CHAIRMAN JENSCH: Is one number larger than the other? Is that it?

MR. TROSTEN: That's right. If he has two numbers that are as close to the two number we are referring to on the previous page, that is, 0.52 percent and 0.54 percent, Dr. Van Winkle says that this doesn't mean anything numerically when you are dealing with the uncertainties that we are facing here.

But it's the noise level that he was talking about a moment ago; but when you are dealing with a number that

jrb64

is 149 percent of another number, then you are dealing with something that is of numerical significance; and I want to know if he agrees with that?

I wasn't talking about biological significance in terms of the effect of this on populations, but just whether these numbers are significantly different.

CHAIRMAN JENSCH: As I say, I don't understand the context.

MR. SHEMIN: I object. He said a 149 percent change was significant in a large reduction scale, but when you get to numbers of this size a change like that is not significant, because you are at the so-called noise level.

MR. TROSTEN: Do you think that's within the noise level?

WITNESS VAN WINKLE: Well, perhaps maybe I can help clarify this for myself.

Are you trying to draw a comparison between the numbers for 1974 and 1975 that appear on page 22 and those that appear for those two years on page 22?

BY MR. TROSTEN:

Q No, I wasn't trying to compare those two; I am just trying to focus on what we both regard as being the significant impact, which is the multi-plant.

A (Dr. Van Winkle) I hate to drag out this question, but I am still having trouble perceiving what the point is.

jrb65

Q Let me ask you in a different way:

Do you think that these two numbers mean that entrainment went up?

A Without having a better understanding of how these numbers are arrived at, I can't give a comfortable answer to that question.

Q Dr. Van Winkle, I have another set of questions I would like to ask you about, which relate again to the spatial and temporal distribution and abundance of the ichthyoplankton in the river; and it also relates, again, -- so we can all perceive where I am trying to go -- to the different data base we have available to us now relative to the data base we had available to us at prior times; that's what we are trying to get at.

Is it correct that at the time of the Indian Point 2 operating license hearing, the data base that was available for an impact assessment relating to spatial and temporal distribution and abundance of young of the year life stages of striped bass in the Hudson River Estuary were primarily those collected by Rathjen and Miller, reported on in 59; Carlson and McCann, reported on in 1969; and the Raytheon Corporation, reported on in 1971?

Do you know that from your knowledge and background in these proceedings?

A That is correct, although I was not aware that

jrb66

the Raytheon studies had really contributed that much on the spatial and temporal distribution of the young of the year life stages.

Q Now, would you agree that the data that have been collected with respect to the spatial and temporal distribution and abundance of these young of the year life stages for the years 1973, 1974, 1975, that data series, are qualitatively superior for impact assessment purposes to the data which were relied upon by the Regulatory Staff in the Indian Point 2 operating license hearing?

A I would agree they are both quantitatively and qualitatively better; certainly qualitatively.

Q Is the 1975 data collection year one of the three years in which the data collected in the river are qualitatively superior, in your judgment, for impact assessment purposes, than the data that were collected prior to the time of the Indian Point 2 operating license hearing?

MR. LEWIS: Objection, that's been asked and answered.

MR. TROSTEN: Have you answered that question?

WITNESS VAN WINKLE: I thought I had in the sense that --

MR. TROSTEN: Thank you.

CHAIRMAN JENSCH: We will consider the question withdrawn.

jrb67

BY MR. TROSTEN:

Q Now, were any of the data which were evaluated in the Indian Point 2 license hearing collected during the years during which Indian Point 2 was operating?

CHAIRMAN JENSCH: Give me that again?

MR. TROSTEN: My question is: were any of the data evaluated in the Indian Point 2 operating license hearing collected during years in which Indian Point 2 was operating?

CHAIRMAN JENSCH: Let me see: the operating hearing was to get a license to operate.

MR. LEWIS: We'll stipulate.

MR. SHEMIN: I'll stipulate there was no operating data used in the operating license hearing.

MR. TROSTEN: Can the record just show that, then we'll move on.

CHAIRMAN JENSCH: I thought it would follow from common sense — unless you are telling us they were operating before they got the operating license? Are you telling us that?

If you are, I think we have a little inquiry on the way here.

(Laughter.)

MR. TROSTEN: Mr. Chairman, I agree it is a relatively obvious point.

jrb29

you are not a lawyer, sir -- but do you understand that the Nuclear Regulatory Commission has an independent responsibility under the National Environmental Policy Act to conduct a benefit-cost analysis of the application that is before you?

MR. SHEMIN: Objection, that calls for a legal conclusion on the part of the witness; and I don't see the relevance of his understanding of the law.

CHAIRMAN JENSCH: He prefaced the statement that he recognized he's not a lawyer. At the same time, I think it's an outline of his duties, if he understands them?

MR. TROSTEN: That's right, sir.

CHAIRMAN JENSCH: The objection is overruled. Proceed.

WITNESS GECKLER: Yes, sir, I understand that.

BY MR. TROSTEN:

Q Is it your understanding of your duties that you are required under the Commission's regulations and the law to evaluate the application without giving particular weight to the comments of any one party or individual?

MR. LEWIS: I will object to that.

I do not find in any regulations or in the NEPA the provisions to which Mr. Trosten just referred; so I would object on that basis. I do not agree with his characterization.

CHAIRMAN JENSCH: Objection sustained.

jrb30

BY MR. TROSTEN:

Q Dr. Geckler, is it your understanding that if the Environmental Protection Agency recommends to the Nuclear Regulatory Commission that the application before you be denied, that you are under an obligation to deny the application?

A (Dr. Geckler.) Would you repeat the question, please?

Q Is it your understanding of your duties, Dr. Geckler, that if you as the Environmental Project Manager, receive a recommendation from the Environmental Protection Agency that this application be denied, that you are under an obligation to deny the application.

A No, I do not understand that.

Q Is it your understanding that if other federal agencies recommend to the Nuclear Regulatory Commission that the application be denied, that you are under an obligation to deny the application?

A No, sir.

Q Dr. Geckler, besides the letters that are bound in Staff's OT-1 from the Environmental Protection Agency and other agencies, are there other letters which you received which contained data which you considered in reaching your determination on this application?

A I do not believe so.

jrb3

I can only answer in those general terms.

Q Yes, I just wanted it in general.

A Yes, sir.

MR. SHEMIN: I have no further questions.

CHAIRMAN JENSCH: New York State Atomic Energy Council?

MR. KING: No questions.

CHAIRMAN JENSCH: Village of Buchanan?

MR. D'ALVIA: No.

CHAIRMAN JENSCH: Regulatory Staff?

MR. LEWIS: Yes, one moment.

BY MR. LEWIS:

Q Dr. McFadden, I have two questions for you:

During the course of your testimony earlier today you referred to various data sets that you have that you referred to as long-time series?

A Yes.

Q Now, I understood you to include as an example of a long-time series the young of the year growth data in the Hudson; is that correct?

A Growth data?

Q Size?

A I don't believe I cited that, specifically. My recollection was citing the commercial fishery catch effort data, and the seine indices of abundance, relative to

jrb5

A That is a reasonable approximation. I don't recall my exact words.

Q Did you hear the testimony of Dr. May or Dr. Campbell, I believe it was, yesterday, to the effect that the 1975 delayed tag study data on the Atlantic coastal fishery was not planned to be undertaken again in 1976; do you recall that testimony?

A Yes, sir.

Q What would be your opinion as to the validity or the weight of the 1975 coastal data extending on?

A I would say, in my judgment, that a second year of the same type of data would be very useful. I would apply a condition to that, however:

I would say that it would be useful primarily if one could delay, say, to the order of four to six years before taking a second sample; in order to allow the present set of age groups which dominate the population to pass out of the fishery.

The reason for that is, as anyone can readily see, it would be possible over some length of time for the relative contributions of the different spawning stocks to change somewhat if one had a particularly strong year class emanating from one river system in a particular year, when that year class dominated the Mid-Atlantic stock, the percentage contributions from different contributing rivers would

December 1974) and of the new ORNL-UT tidal-averaged, one-dimensional transport model for the striped bass young-of-the-year population in the Hudson River (Eraslan et al., December 1976). I continue to carry the major responsibility for NRC of evaluating the aquatic biological data and analyses generated by the Consolidated Edison research program and of updating NRC's assessment in this area. In addition, I am involved with impact assessment work on the Hudson River, particularly with respect to striped bass and other fish populations, for the U. S. Environmental Protection Agency, Region II (Hudson River Interagency Technical Committee), and for the U. S. Corp of Engineers.

I am a member of the American Association for the Advancement of Science, American Fisheries Society, Atlantic Estuarine Research Society, Ecological Society of America, and Sigma Xi.

jrb19

inconsistencies between the two documents that to draw together in one coherent statement a list of the bases for the action taken --

CHAIRMAN JENSCH: Proceed.

MR. LEWIS: Thank you.

WITNESS GECKLER: In the Draft Environmental Statement we listed some benefits which we felt were warranted -- warranted a longer extension of once-through cooling; because we wanted to provide an opportunity for some decisions to be made before any construction had begun.

In addition, as a result of publishing the DES we received a large number of comments, and particularly from the Environmental Project Agency --

Q Is that the Environmental Protection Agency?

A I am sorry, Environmental Protection Agency -- relative to one of the benefits we had described in the DES permitting the EPA proceedings in this case to proceed to completion.

The EPA had some strong comments that I would like to refer to, and quote briefly from; and I turn now to page A-10, which is Appendix A; and in the first paragraph of that letter, beginning with the second sentence, EPA says:

"We believe the proposed amendment to be unwarranted and in conflict with EPA's decision-making

jrb25

and the Oak Ridge National Laboratory life cycle model, both of which were used in Indian Point 3 FES. Striped bass projections from the Staff's life cycle model indicate to the Staff that the incremental long-term impact on the striped bass population due to the requested extension of time, i.e., two years, is negligible.

With respect to impact both for striped bass and other fish species, which is addressed on pages 3-6 and 3-7 we commented that there would be additional fish impinged and estimates of the numbers are given on those pages.

The Staff then commented -- I in particular commented -- "Although the staff certainly does not consider these impingement losses to be trivial, the staff concludes that the incremental long-term impact from these losses is not expected to be large and has essentially no risk of being irreversible."

Well, this is one side of the coin with respect to my analysis in terms of the cost of the environmental damage. The other side of the coin, the potential benefit of the Applicant's ongoing research program, and the ongoing analyses by Oak Ridge and other groups, this issue is most completely addressed in the comments section on pages 7-2 through 7-4.

On these pages I have quoted four paragraphs from other places in the FES, and I have then commented on the

jrb8

be sworn?

MR. LEWIS: For the reporter's benefit, Dr. Robert Geckler and Dr. Webster Van Winkle.

Whereupon,

ROBERT GECKLER

and

WEBSTER VAN WINKLE

were called as witnesses on behalf of Regulatory Staff and, having been first duly sworn, were examined and testified as follows:

MR. LEWIS: Mr. Chairman, the professional qualifications of Dr. Geckler are already included in the record. They are to be found at - following page 164 of the October 5 evidentiary hearing on the Selection of Preferred Alternative Closed Cycle Cooling System hearing; and if that is satisfactory, I would propose to rest upon their inclusion therein -- if no party has any objection.

CHAIRMAN JENSCH: That is sufficient; proceed.

MR. LEWIS: Mr. Chairman, I am looking for my last copy of Dr. Van Winkle's professional qualifications so I can show it to him.

I have distributed to the Board and parties earlier the professional qualifications of Dr. Van Winkle; and if I might not have any at the moment, I will simply ask him whether or not he did prepare for this proceeding a

jrb7

very real sense not an only observation of the contribution of the Hudson River; although it arose from a different type of data, namely, recaptures of tagged fish, Dr. Rainey's analysis of the contribution based on taking returns entered into the original Indian Point 2 proceedings, reached essentially the same conclusion as the present, but different -- technically different -- relative contribution study.

And in this sense the 1955 data represent a second measurement which replicates and duplicates the first estimate very closely.

MR. TROSTEN: Dr. McFadden, you referred to the 1955; did you intend to refer to the 1975?

WITNESS MC FADDEN: Yes, sir, I slipped by 20 years. I mean what I said to refer to the 75 data.

MR. TROSTEN: Thank you.

MR. LEWIS: That is all the recross I have.

CHAIRMAN JENSCH: Any redirect?

MR. TROSTEN: No, sir.

CHAIRMAN JENSCH: Thank you, Dr. McFadden, you are excused.

(Witness excused.)

CHAIRMAN JENSCH: Are you ready to proceed with the Staff?

MR. TROSTEN: Yes, sir, we are.

CHAIRMAN JENSCH: Will Staff witnesses stand and

jrb9

statement of professional qualifications?

WITNESS VAN WINKLE: Yes, I did.

DIRECT EXAMINATION

BY MR. LEWIS:

Q Was that a true and correct statement of your educational background?

A (Dr. Van Winkle.) Yes, it was.

MR. LEWIS: I have provided to the reporter already apparently all the copies I had; and I would ask it be included in the record as if read.

CHAIRMAN JENSCH: Is there any objection, Hudson River?

MS. CHASIS: No.

CHAIRMAN JENSCH: Attorney General for New York?

MR. SHEMIN: No, sir.

CHAIRMAN JENSCH: New York Atomic Energy Council?

MR. KING: No objection.

CHAIRMAN JENSCH: Village of Buchanan?

MR. D'ALVIA: No.

CHAIRMAN JENSCH: With out objection the motion of counsel is granted and the statement of professional qualifications of Witness Van Winkle may be incorporated within the transcript as if orally presented, and shall constitute evidence on behalf of the Regulatory Staff.

(The document follows:)

PROFESSIONAL QUALIFICATIONS OF DR. WEBSTER VAN WINKLE

I am employed as a Research Staff Member in the Environmental Sciences Division at Oak Ridge National Laboratory, Oak Ridge, Tennessee. My educational background includes a B.A. from Oberlin College in 1961 and a Ph.D. in Zoology from Rutgers University in 1967. My graduate training was primarily in the area of ecology and physiology of estuarine organisms and involved research experience in both Raritan Bay and Delaware Bay. I was a Research Associate and on-site Director of the Rutgers University Shellfish Research Laboratory at Monmouth Beach, New Jersey, during 1966-1967; the focus of the research at the laboratory was the purification of hard clams collected from polluted waters.

From 1967-1970 I was Assistant Professor of Biology at the College of William and Mary, where I taught undergraduate and graduate courses in comparative animal physiology, physiological ecology of aquatic organisms, biometry, and experimental design. With the support of postdoctoral fellowships from the National Science Foundation, I continued laboratory and field research during the summers of 1968 and 1969 at the Virginia Institute of Marine Science and the Duke University Marine Laboratory. My research centered on the ability of estuarine organisms to compensate for temperature and salinity stresses.

I was a National Science Foundation and a U. S. Public Health Service Postdoctoral Fellow in the Biomathematics program at North Carolina State University during 1970-1972, where I obtained further experience and formal training in mathematics, statistics, and, most important, in modeling biological systems.

I joined the staff of the Oak Ridge National Laboratory in August of 1972 with primary responsibility for the development of simulation models to aid in the assessment of the potential impact of man-made stresses on populations such as the striped bass. In January 1973 I was assigned part time to the Environmental Assessments Project with responsibility for consideration of the potential effects on the aquatic environment of Indian Point Unit 3 Nuclear Power Plant.

At present I am in charge of the Fish Population Modeling Project in the Aquatic Ecology Section of the Environmental Sciences Division. The overall objective of this project is to develop and apply computer simulation models and statistical methodologies for fish populations that will be of value: (a) in evaluating the consequences of man-made stresses, (b) in placing previously qualitative statements into a quantitative framework, and (c) in defining issues where field and laboratory research are essential for more accurate estimates of impacts. Our current focus is simulation models for single fish populations, with particular emphasis on compensatory phenomena involving fishing mortality and mortality during the first year of life.

In the course of my research and impact assessment work I have had numerous technical discussions with personnel from Consolidated Edison and their contractors and with the intervenors. I had primary responsibility for the aquatic biology sections in the Final Environmental Statement for Indian Point Unit No. 3 (February 1975) and for the Final Environmental Statement for Facility License Amendment for Extension of Operation with Once-through Cooling, Indian Point Unit No. 2 (November 1976). I was intimately involved in the development, documentation, and application of the ORNL striped bass life-cycle model (Van Winkle et al.,

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jrb10

MR. LEWIS: Mr. Chairman, I am showing, first of all, Dr. Geckler a document entitled -- well, first of all, let me have this identified.

It is the Final Environmental Statement --

CHAIRMAN JENSCH: You are not going to put the entire 30 copies into the transcript?

MR. LEWIS: No, unfortunately I don't. I have provided three copies to the reporter; and would ask that it be -- I believe it would be Staff Exhibit OT-1.

CHAIRMAN JENSCH: All right.

I think we've always put the FES in the transcript so that people would have the benefit of it who might not otherwise have access to the exhibit.

MR. LEWIS: Unfortunately, we did not have the necessary number of copies sent up; so with your permission I will identify it as Staff OT Exhibit 1. It is the Final Environmental Statement for Facility License Amendment for Extension of Operation with Once-through Cooling, NUREG-0130.

CHAIRMAN JENSCH: The document to which Staff counsel just referred may be marked for identification as Staff Exhibit OT-1.

(The document referred to was marked Staff Exhibit OT-1 for identification)

jrbll

BY MR. LEWIS:

Q I would show Dr. Geckler a copy of this document.

(Handing document to witness.)

And I ask him to articulate his role in the preparation of it.

A (Dr. Geckler.) I am the Environmental Project Manager for Indian Point, and in particular this document on the extension of operation with once-through cooling -- my role is to coordinate the technical effort, and to take the efforts of the consultants and also our in-house staff who write and produce the document.

Q Were you responsible, generally, for its preparation and publication?

A Yes.

Q Dr. Van Winkle, let me show similarly a copy of the Staff's Final Environmental Statement, and ask you to articulate your role in its preparation?

(Handing document to witness.)

MR. SHEMIN: Excuse me, could we have you turn your table this way?

(Pause)

WITNESS VAN WINKLE: My role in the preparation of this document, I had primary responsibility for the sections dealing with the aquatic impacts.

BY MR. LEWIS:

JRB12

Q Now, let me ask either of you whether you have any corrections you wish to make to this document; Dr. Van Winkle, do you have any corrections?

A (Dr. Van Winkle) I have three corrections, two of them are on page 7-7, the chapter dealing with "Response to Comments". The third paragraph

The third paragraph down it starts with "The staff agrees with the applicant" -- down through "on this foundation is scientific charlatanism." -- should be deleted.

MR. TROSTEN: What should be deleted?

WITNESS VAN WINKLE: That entire paragraph.

Following the last sentence at the bottom of the page, the sentence that ends, "upon the addition of one more data point.", the following sentence should be added: "With respect to the first analysis the information to calculate three" --

CHAIRMAN JENSCH: Go slowly.

WITNESS VAN WINKLE: I'll start over again.

"With respect to the first analysis the information to calculate three more data points (the years 1973, 1974, 1975) is already available."

And the second and last sentence, "However, since the striped bass commercial fishery in the Hudson River is closed due to the PCB problem, no additional data points past 1975 will be available until some unknown time in the

jrb13

future."

BY MR. LEWIS:

Q Is that the end of that addition?

A (Dr. Van Winkle.) Yes, that is the end of that addition.

I will go on with the third and final correction: On page 7-9 the paragraph starting at the bottom of the page that starts, "A closer look at the 1973 and 1974 data" -- starting from there, those three lines on page 7-9 should be deleted; and the text continues on page 7-11, to the end of the first sentence there on the top of that page -- "in 1973." -- should be deleted up to that point.

And Table 1 itself on page 7-10 should be deleted in its entirely.

Q I am sorry, Table 1 on page 7-10 is deleted in its entirety?

A Yes, sir.

Q Would you explain, perhaps very briefly, what prompts you to make this deletion as to the Table 1 on page 7-10, and the descriptive sentences on 7-9 and 7-11?

A It was my misunderstanding -- for which I take the blame -- that I did not properly pursue things so I understood what the phraseology, "total standing crop" stood for; and upon talking with individuals from Texas Instruments yesterday, it became apparent to me that it was not these

jrb16

MR. LEWIS: Mr. Chairman, I would ask that the Staff's Final Environmental Statement which has been marked as Staff OT-1 be admitted into evidence as an exhibit in this proceeding?

CHAIRMAN JENSCH: Any objection?

MR. TROSTEN: No objection.

CHAIRMAN JENSCH: Hudson River?

MS. CHASIS: No objection.

CHAIRMAN JENSCH: Attorney General?

MR. SHEMIN: No objection.

CHAIRMAN JENSCH: New York State Energy Council?

MR. KING: No objection.

CHAIRMAN JENSCH: Village of Buchanan?

MR. D'ALVIA: No objection.

CHAIRMAN JENSCH: There being no objection, Staff Exhibit OT-1 is received.

(The document referred to, previously marked Staff Exhibit OT-1 for identification, was received in evidence.)

MR. LEWIS: Let me direct a few questions first of all to Dr. Geckler.

BY MR. LEWIS:

Q First of all, Dr. Geckler, there has been mention on several occasions by the licensee's panel of witnesses that

jrb14

number do not represent what I had taken them to be.

I worked on this some more last night and for a while I was of the opinion that although these are clearly not estimates of probability of survival from post yolk-sac larvae to juveniles, that they could be treated as first approximations of such.

I would have felt comfortable with that type of a modification if, in fact, the time interval between peaks -- in other words, the time interval between the peak post yolk-sac larvae occurrence in any one year and appearance of the peak standing crop of juveniles, either the ichthyoplankton or the beach seines, if that interval of time had been the same for 1973 and 1974; if that had been the case, although these are peak standing crops, I think a sound argument could be made that this would be a reasonable methodology of arriving at relative survals that you could use to compare from one year to the other, to the next.

However, upon looking back to the Texas Instruments data it became apparent that the time interval was -- for 1973 was around three weeks or so, between the post yolk-sac larvae peak, and the juvenile ichthyplankton; whereas it was about six weeks in 1974. The peak yolk-sac larvae, the peak for the yolk-sac larvae occurred about a week and a half earlier in 1974, and the peak juvenile ichthyoplankton gear occurred about a week and a half after -- in 1974 it

jrb15

occurred about a week and a half later than it did in 1973.

So there was a difference in the interval between the peaks of approximately three weeks. And without further thought I do not feel that it is safe at this point to interpret the work that was done in this table as a reasonable first approximation to probability of survival through this life stage for its particular import in terms of power plant impact.

I might add that upon conversation with Texas Instruments personnel it does not appear that we can really get out of their field data the appropriate information to do this type of analysis; although this is something I think we both plan to think about further.

Q Thank you.

All right, Dr. Geckler, are there any corrections you wish made to this document?

A (Dr. Geckler) No.

Q Dr. Geckler, as this has been now corrected, are the contents of this document true and correct to the best of your knowledge and belief?

A Except for a few typographical errors, yes.

Q Fine, thank you.

Dr. Van Winkle, are they true and correct to the best of your knowledge and belief?

A (Dr. Van Winkle) Yes, they are.

jrb22

letter:

"We are concerned that the welfare of the fishery resources of the Hudson River may be jeopardized by this further delay in the termination of once-through cooling."

On page A-29, under the topic "Fish and Wildlife" on the right-hand side of the page, approximately the middle sentence in the paragraph:

"The welfare of the fishery resources of the Hudson River should not be jeopardized by any delays which could be avoided."

That is basically the Department of Interior's position.

I am not going to take any other quotes from the Appendix, but I would point out that the New York State Department of Environmental Conservation also was consistent with the positions of the agencies I have already mentioned; and a number of other State agencies, Attorney General, for example, and a number of conservation groups took much the same position.

One final fact enters into our decision to recommend a one-year delay instead of two in the Final Environmental Statement; and that was that the question of closed cycle cooling for Indian Point 2 has already been litigated; and the decision has been mandated that closed

jrb21

irreversibility; Section 316(b) of the FWPCA states that intake structures must reflect the best technology available to minimize adverse environmental impact. To say that the damage will not be irreversible is not the same as to say that it will be minimal. In fact, substantial damage could result from the two-year extension of operation with once-through cooling."

The contents of that letter seem to warrant at the time that we received it a review of our position as set forth in the Draft Environmental Statement. So we reviewed that position, and we noted that two of the major benefits we had anticipated for the two-year delay had already been obtained; namely, the selection of the preferred closed-cycle cooling system had been accomplished; and the time made available for the expression of public interest had been made available; and the Village of Buchanan and others appeared and stated their positions.

The EPA was not the only one to comment along the lines that it did.

The Department of CmCommerce, namely, NOAA, and the Department of Interior were two major federal agencies which expressed opinions.

I would like to quote now from page A-19, A-20, the view of the Department of Interior. The first quotation is the next to the last paragraph in the cover

jrb18

between the old methodology and the new methodology for some period, so as to see what relationship exists between the two types of gear.

Q In your opinion had Con Ed approached the Staff to discuss the addition to their study program of larval tables, what is your opinion as to the likely response of the Staff to the suggestion?

A Well, we certainly would discuss it quite openly with the company; if it offered improvement in data collection without interferring with the limitations I mentioned earlier, we would encourage it.

Q Dr. Geckler, turning to another matter, the question has been raised as to the bases for the Staff's recommendation in the FES of only a one-year extension rather than a two-year extension supported in the Draft Environmental Statement.

Could you briefly outline the bases for the Staff's final recommendation?

MR. TROSTEN: Excuse me, Mr. Chairman.

Does this constitute a modification? This is additional testimony, or corrections, or what, Mr. Lewis? I don't quite understand. It sounds almost like redirect.

MR. LEWIS: Well, I hope it doesn't.

I felt in light of the fact that the Licensee had raised questions regarding what it perceived to be

jrb17

the requirements of the environmental technical specifications for this facility dictated the type of sampling methods they could undertake; and in their minds presented some kind of an impediment to them in undertaking the larval table studies.

Could you comment, generally, on your view as to what the environmental technical specifications require in this respect?

A (Dr. Geckler) The technical specifications outline a program to the extent even to identifying certain types of equipment that may be used. This does not prohibit doing more than is listed in the technical specifications, without any reference to approvals of any kind.

In general, we do not like to change tech specs with types of equipment and things of that sort without a review of it, especially for items that might change the nature of the data such that year-to-year comparisons cannot be validly made. For one-time affairs the type of equipment can be more freely chosen.

There is a provision in the environmental technical specifications for changes to be made without our review or approval, provided they are documented in the annual report.

However, in changing major items of gear, while we might certainly approve such a change -- major change such as that -- we would like to have a comparison made

jrb24

a potential value of the Applicant's ongoing research program, and of ongoing analyses by Oak Ridge National Laboratories and other groups.

I emphasize that this was a fairly narrow focus.

Since that time there have been no substantial modifications or updating of my material. The material that appears in the FES is for the most part the same as what was in the DES; the only major additions being the comments section in Chapter 7.

As of a year ago we did not see a need nor was there sufficient new information at that time to merit another -- quote-unquote -- "fresh look" as mandated by ALAB 188. Only one-half year earlier in the Indian Point 3 FES we had carried out a very comprehensive analysis.

As a result of my assessment of the incremental impact on the Hudson River ecosystem and the fish populations in particular resulting from two additional years of once-through cooling at Indian Point 2 was as follows:

In part I will be hitting the highlights from Chapter 3, here.

First, on page 3-6 with respect to the incremental long-term entrainment impact on the Hudson River striped bass population, this was estimated using the Oak Ridge National Laboratory University of Tennessee transport model,

jrb23

cycle cooling will be installed at Indian Point.

So, on the basis that two major benefits had already been realized, and the comments on the Draft Environmental Statement, particularly from EPA, and other federal agencies, and the fact that the issue had already been litigated, we decided that to maintain our position of a two-year delay was unwarranted, and, therefore, we changed it.

Q Thank you.

MR. LEWIS: Mr. Chairman, in a similar vein I thought it would be useful to have Dr. Van Winkle explain his views as to the context in which this particular amendment proceeding arises. I think this is particularly useful in that he has had continuing review responsibility for the Indian Point proceedings for quite some time; and I believe can usefully state views as to the context in which he believes the present question is posed.

And if you will permit me, I will ask him to undertake that statement.

CHAIRMAN JENSCH: Proceed.

WITNESS VAN WINKLE: My input to the DES phase of this work was prepared over a year ago in November 1975, with a specific focus of assessing the incremental impact on the Hudson River ecosystem with two additional years of once-through cooling at Indian Point as balanced against

jrb20

authority. This belief is based on a careful evaluation of the proposed action in the context of the present situation, that is, actions taken to date by the applicant, Con Ed" -- Con Edison -- pardon me -- "and EPA's authority and responsibilities under the Federal Water Pollution Control Act Amendments of 1972 (FWPCA) and the National Pollutant Discharge Elimination System (NPDES).

Another quote in the third paragraph:

"By taking the proposed action, NRC would contradict EPA's permit requirements, conflict with EPA's decision-making responsibility, and perhaps even prejudice the adjudicatory hearing on the closed-cycle cooling system and compliance schedule. In our judgment, the proposed action will serve no practical purpose and may even interfere with the expeditious resolution through normal channels of the questions concerning closed-cycle cooling at Unit 2."

And finally, at the bottom of page A-11,

"Besides the question of whether the proposed amendment is necessary and valid, there is the question of its environmental effects. The NRC Staff believes that no irreversible harm to the Hudson River ecosystem, in particular the striped bass and other fish populations, will be caused by a two-year extension of operation with once-through cooling. We question the NRC's criterion of

jrb26

following two topics; first, the distinction between the benefit of additional data, and the benefit of completing ongoing analyses; and second, the responsibility of the Staff to base its decision on the most complete and scientifically sound analysis that could be made available within an acceptable timeframe, and without incurring unacceptable incremental damage to the environment.

In summary, after balancing the environmental costs, risks versus the benefits, the Staff's judgment was that the incremental impact on the Hudson River ecosystem striped bass population and other fish populations in particular due to this requested two-year extension of once-through cooling at Indian Point 2 was acceptable. In other words, the incremental environmental damage was not a basis for the change from two years to the one year, and going from the DES to the FES.

BY MR. LEWIS:

Q Does this complete your summary, then?

A (Dr. Van Winkle.) Yes.

MR. LEWIS: Mr. Chairman, this panel is available for questioning.

CHAIRMAN JENSCH: Licensee?

MR. TROSTEN: Thank you, Mr. Chairman.

Mr. Chairman, I would like to proceed now with cross-examination of Dr. Geckler and Dr. Van Winkle. My

jrb31

Q In other words, the letters that are bound in the appendix to the FES constitute the communications to which you referred in your oral testimony?

A Yes, sir.

MR. SHEMIN: Can I object? The first question referred to data, the second referred to communications; and I think that is an attempt to mislead the witness, particularly in view of the fact that they received communications, which was not data, which they may have considered specifically as a reason for deleting that extra year.

MR. TROSTEN: No, there's not going to be any attempt to mislead the witness.

CHAIRMAN JENSCH: Would you keep that distinction in mind?

WITNESS GECKLER: I did not recognize the distinction.

MR. TROSTEN: I am simply trying to establish with Dr. Geckler, Mr. Chairman, that all of us understand clearly what was the basis upon which Dr. Geckler acted.

CHAIRMAN JENSCH: I think that's a better question. Proceed.

BY MR. TROSTEN:

Q I understand that your answer is that these are the letters that you received, and whatever is contained in

jrb32

these letters constitutes the data or the analyses upon which you relief insofar as these federal agencies are concerned?

A (Dr. Geckler) That is correct.

Q Dr. Geckler, are you familiar with the provisions of the Indian Point 2 operating license?

CHAIRMAN JENSCH: Do you want to refer hin to some particular section and tender it to him for his perusal?

MR. TROSTEN: I will show it to him, sir.

WITNESS GECKLER: I am familiar with some of them.

BY MR. TROSTEN:

Q Dr. Geckler, I am going to show you a provision from the Indian Point 2 operating license.

MR. TROSTEN: I am actually, Mr. Chairman, reading from the Appeal Board Decision, ALAB 138; it is the provision in the operating license.

(Handing document to witness.)

BY MR. TROSTEN:

Q Are you familiar with this provision, Subsection 2(e)(1)(c), which reads as follows: "that the applicant believes that the empirical data collected during this interim operation justifies an extension of the interim operation period or such other relief as may be appropriate to make timely application to the Atomic Energy Commission;

jrb 33

the filing of such application in and of itself will not warrant an extension of the interim operation period."

A (Dr. Geckler) Yes, I am familiar with that.

Q Thank you.

Now, Dr. Geckler, in the summary and conclusions on page little "i" of the Final Environmental Statement, Staff's OT-1, subheading 2., reads "Facility Operating License No DPR-26), the licensee is required to terminate once-through cooling at Unit No. 2 after an interim period, the reasonable termination date for which appeared at the time the license was issued to be may 1, 1979, and to operate thereafter with a closed cycle cooling system," -- then you go on to state -- "unless licensee can show that empirical data" et cetera.

Do you see the phrase "an to operate thereafter with a closed-cycle cooling system"?

A Yes, sir.

Q Would you be kind enough to point me to the provision in the Indian Point 2 operating license that contains that phrase?

CHAIRMAN JENSCH: I think the premise is incorrect, but I don't know that the premise is established in that decision. I think that embraces the law applicable to the licensee here, and I think it has been reflected in all of the Staff documents as a consensus document, that Con

jrb34

Edison can't shut down its wheels and say, we're just not going to play any more, we're not going to operate or render any service; it's a consensus document that has heretofore been filed several times by the Staff, and as indicated, they are going to continue to render their electrical service and they will continue to bear in mind all the obligations applicable to it. Therefore, if you want to continue, you are going to have to do it with a closed-cycle system.

I think this is a legal question, more for counsel of Reg Staff.

MR. TROSTEN: Mr. Chairman, if I may, I am not trying to mislead or to confuse the witness. The record will show very clearly, as a matter of fact, that these words do not appear in the Indian Point 2 operating license.

What I am trying to get at, Mr. Chairman, is really very simple: I am trying to determine whether this witness misundertood, really, what his duties really required in this case.

I am trying to establish whether he understood what his responsibilities were, because if he really misunderstood his responsibilities and felt he had to do something other than what he had to do, it had a very important effect on the recommendation he is making to the Board.

CHAIRMAN JENSCH: Perhaps you should phrase your

jrb35

question in that form. I think you should rephrase your question.

MR. TROSTEN: Oh, I think we've probably pursued the point.

CHAIRMAN JENSCH: All right.

BY MR. TROSTEN:

Q Dr. Geckler, you mentioned a moment ago if my notes are correct that one of the reasons why the Staff changed its position was that the Village of Buchanan had an adequate opportunity to express its views with regard to the closed-cycle cooling system; is that a fair statement of what you said?

A (Dr. Geckler) Yes.

Q It is your understanding, is it not, that the Village of Buchanan is a party in this proceeding, and is urging that an extension be granted; that the year to May 1, 1981 for once-through cooling be granted to Con Edison?

A Yes, I understand that.

MR. JENSCH: Excuse me for interrupting.

You were referring to a statement made the other day by Mr. D'Alvia?

MR. TROSTEN: No, sir, I am referring to a statement made at the prehearing conference, the petition to intervene.

CHAIRMAN JENSCH: Yes, which was subsequent to the writing of this FES.

jrb36

MR. TROSTEN: Yes, sir.

CHAIRMAN JENSCH: At the time he wrote that, I take it -- I think the time difference might be leading to some confusion; at the time he wrote this I take it he was referring to the previous proceedings in which the Village could have participated, but apparently abstained.

Is that it?

WITNESS GECKLER: In the previous proceedings there were limited appearances by the Village of Buchanan and my understanding is they chose not to be party to those proceedings; but they did have an opportunity to come in and make statements about the kind of system they wished to have. These comments were reflected also in the comments we received from the DES, and were fully considered along with all the others in our evaluation.

BY MR. TROSTEN:

Q Well, Dr. Geckler, recognizing you wrote the earlier words before you were fully aware of what the Village was doing in this proceeding, now that you are aware of their participation in this proceeding that the Village of Buchanan is a party in this proceeding, and is urging that the additional year be afforded to allow consideration of Con Edison's research program, do you now feel that there is an additional benefit to granting the program?

MR. LEWIS: Mr. Chairman, my prlblem with the

jrb37

question is as follows:

I believe Mr. Trosten has misstated what Dr. Geckler earlier stated.

MR. TROSTEN: Oh, I see.

MR. LEWIS: I believe Dr. Geckler's earlier statement was with effect to the allowance of the first year to permit completion of the selection of the tower proceeding; the Village of Buchanan's input and others, Peekskill, other governmental bodies in the area, had been received.

MR. TROSTEN: I understood that's what he said.

MR. LEWIS: Was that what you stated, Dr. Geckler?

WITNESS GECKLER: Yes.

MR. TROSTEN: I understood that's what he said.

MR. LEWIS: Well, my point is: I fail to see, if that's what Dr. Geckler said, I fail to see what the participation of the Village of Buchanan in this proceeding has to do with it -- which certainly Dr. Geckler does not deny; it's a fact -- but I fail to see how that bears upon his statement.

MR. TROSTEN: Mr. Chairman, could the witness -- I realize that's how Mr. Lewis feels -- but could the witness answer the question.

CHAIRMAN JENSCH: I think what Staff counsel is trying to do is be sure the premise is established correctly;

jrb38

and I think he has established the premise now; and on that basis the witness may answer.

I think what you are asking is now that the Village of Buchanan is here, should he change his recommendation?

MR. TROSTEN: Yes, I was asking the witness --

CHAIRMAN JENSCH: If the presence of the Village changes the whole picture?

MR. TROSTEN: Now that he is aware that the Village is seeking an additional year of once-through cooling, and would like to have this opportunity, does this additional fact cause you to feel that there is an additional benefit that perhaps you did not consider when you wrote this statement?

After all, the Staff participates in these proceedings, and can sometimes change its mind when it hears these things?

WITNESS GECKLER: We've all been aware --

CHAIRMAN JENSCH: Answer the question yes or no. He asked is this an additional benefit that changes your mind; then you can explain it any way.

WITNESS GECKLER: No.

BY MR. TROSTEN:

Q You don't think so.

A (Dr. Geckler) That is correct.

Q Moving on to another point, you mentioned -- I

jrb39

believe you said the New York State Department of Environmental Conservation furnished comments on the DES, and that these were consistent with the position taken, for example, by the Environmental Protection Agency; is that a correct summary of what you said?

A I believe so.

Now, they made some other statements, but the position of the State was that there was no justification for an extension.

Q Well, the comments of the State, of course, will speak for themselves; they appear on pages A-23 and 24 and following pages in the FES.

But my question is this: you are aware, are you not, that the New York State Energy Office is participating as a party in these proceedings; is that correct?

A Yes.

Q You are aware that the New York State Energy Office has stated that it is awaiting the outcome of this proceeding before it states its final position; is that correct?

A Yes, I am aware of that.

Q So it would not be correct, therefore, to state -- would it? -- that the New York State Energy Office favors the denial of this application?

A I said it was the Department of Environmental

jrb40

Conservation.

Q All right.

Now that you are aware that the New York State Energy Office takes a position that we should await the outcome of this hearing before it takes a position with regard to the granting or denial of our application, do you think this affords additional benefits which should be factored into the Staff's evaluation?

CHAIRMAN JENSCH: How does it benefit? I'm not sure I understand your question. How do you factor a sterile position, where you are not going to say anything about anything, until something else is done; how does he work that in? Tell me what you mean by "factoring"?

MR. TROSTEN: I have two comments on that; number one, I don't know -- I mean, I have to ask the witness.

CHAIRMAN JENSCH: You are asking him to prepare a process, to follow a process of factoring in; will you describe the process by which you are asking him to carry on that activity?

MR. TROSTEN: I might rephrase the question.

BY MR. TROSTEN:

Q Now that you are aware of the position of the New York State Energy Office, do you consider that that position provides an additional benefit which should be weighed in the Staff's benefit-cost evaluation which might cause you

jrb41

to recommend the granting of this application?

MR. LEWIS: Objection, Mr. Chairman.

My objection is as follows: I believe the question is based upon some asserted relationship between the Department of Environmental Conservation and the State Energy Office; while that relationship might well exist, and in fact the Energy Office is here in this proceeding, the fact remains that comments were received from the Department of Environmental Conservation, and which were duly considered.

Now, I -- my objection is that Mr. Trosten essentially is asserting that the position of the State Energy Office has somehow superseded the comments of the New York State Department of Environmental Conservation in the DES, which I vigorously would object to.

MR. TROSTEN: Mr. Chairman, I wasn't asserting anything; I was asking the witness a question.

CHAIRMAN JENSCH: But the premise, you do not consider this phase of it as a premise to your question, that which Staff counsel just referred to?

MR. TROSTEN: Mr. Chairman --

CHAIRMAN JENSCH: Do you include his objection as a part of your premise?

MR. TROSTEN: No, I really don't.

CHAIRMAN JENSCH: The objection is overruled.

jrb42

Is it a fact that this New York State Energy Office considers it a benefit, do you know? Is it a fact that this New York State Energy Office is saying nothing in this proceeding at all, a benefit in your analysis?

WITNESS GECKLER: No.

MR. TROSTEN: Just one moment.

(Pause)

BY MR. TROSten;

Q Dr. Geckler, you manticned that one of the reasons why you decided that the application should be denied -- Con Edison's application should be denied -- was that, I believe you said that the matter had already been litigated.

Now, did you decide the matter had already been litigated?

CHAIRMAN JENSCH: What was the "matter"?

MR. TROSTEN: I would have to have the reporter read it back, Mr. Chairman.

Essentially, as I recall and if my notes are correct, I believe Dr. Geckler said that one of the major benefits -- he said the reason why -- I believe he said -- three basic reasons why he felt they should change their position. One of these reasons would have to do with the comments of other agencies, and the other reason was something to the effect that the issue had already been litigated.

jrb43

I noted that phrase. And I don't recall it any more clearly than that.

According to our notes here, I think he said, the issue of closed-cycle cooling has already been litigated. Now, the record, of course, will speak for itself.

CHAIRMAN JENSCH: That's what you are asking about.

MR. TROSTEN: I was asking him if he had decided that the issue of closed-cycle cooling had already been litigated.

CHAIRMAN JENSCH: Did you so understand?

WITNESS GECKLER: It is my understanding that it has been litigated; and my reasons for this understanding are twofold: one, is I have read the decisions and the Commission order, which seems to me to indicate that it's been indicated; and my attorneys tell me that.

BY MR. TROSTEN:

Q Now, again recognizing of course you are not a lawyer, I assume that you rely heavily on an opinion from your attorneys that the issue had already been litigated; is that right?

MR. LEWIS: Objection. I believe the witness has just stated two matters on which he relied, one of which was Staff counsel.

MR.TROSTEN: I was simply trying to understand

jrb44

how --

CHAIRMAN JENSCH: He's trying to get the balance, a correlation or something here?

Overruled.

BY MR. TROSTEN:

Q Dr. Geckler, did you receive a written opinion from counsel that this issue had already been litigated?

A (Dr. Geckler) No.

CHAIRMAN JENSCH: When you were a member of the Staff of the Atomic Energy Commission did you write an opinion everytime you gave an expression of advice?

MR. TROSTEN: We used to say they never paid any attention to us, Mr. Chairman.

(Laughter.)

CHAIRMAN JENSCH: I guess things haven't changed; go ahead.

(Laughter.)

BY MR. TROSTEN:

Q Dr. Geckler, let me ask you some other questions: Were there any outside consultants who reviewed the draft environmental statement besides the Oak Ridge National Laboratory?

A (Dr. Geckler) Not to my knowledge.

Q Did you submit it to any federal agency for review prior to the publication of the Draft Environmental

jrb45

Statement?

A No.

Q Dr. Geckler, during the prehearing conference in this proceeding on October 27, your counsel referred to an interagency task force on the Hudson River Fishery -- starting at page 32 of the prehearing transcript?

A I recall.

Q Are you a member of that task force?

A No, sir.

MR. LEWIS: Mr. Trosten, perhaps Dr. Van Winkle could comment?

MR. TROSTEN: That's okay.

I have no further questions of Dr. Geckler at at this time, Mr. Chairman.

CHAIRMAN JENSCH: If you could conduct the examination, I think one attorney from one party should; and it kind of helps a witness to get adjusted to the examination by one party. I know you have somebody else in mind, but the whole team will get into the act; and I think ordinarily one lawyer handles one party.

We won't be too formal in that regard, but I think it helps move it along, if you could do it that way.

MR. TROSTEN: We could do it this way, Mr. Chairman if it is really necessary. We frankly have prepared by dividing the work, and it will move somewhat more slowly

if I do it all by myself.

CHAIRMAN JENSCH: All right.

BY MR. TROSTEN:

Q Dr. Van Winkle, I have a series of questions I would like to ask you, and what I would like to do is to tell you basically the points that I want to discuss with you, so that we will all understand what I am trying to get at.

Now, I will do that, and then we will discuss basically where we are going.

The first point is that I would like to discuss the value of the 1975 data, and I want to discuss it particularly with regard to the value of the 75 data and earlier data for impact assessment purposes. That is basically the point I am trying to get at.

So let me ask you these questions in this frame of reference.

Would you say, Dr. Van Winkle, that the applicant's that is, Con Edison's 1973 data are better than that which were available during the original Indian Point 2 hearing?

A (Dr. Van Winkle) Yes.

Q Would you say that the Con Edison's 1974 data are better than the 1973 data?

A That is my general impression, although I am not as familiar with them as I am with the 1973 data.

jrb47

Q Yes.

Dr. Van Winkle, has the Oak Ridge National Laboratory based its assessment of power plant impact on the Hudson River primarily upon the 1973 data?

A Yes, as opposed to the 1974 data.

Q As opposed to the 1974, or earlier, or later, data.

A I guess I would add to that response there is a fair amount of our assessment that is independent of 73, 74, 75 data.

For instance, our estimates of contribution to the Mid-Atlantic, et cetera, are based on information pre-1973.

Q Right, sure, absolutely.

Would it be possible that the Staff's conclusions about the impact of once-through cooling on the Hudson River would change if 1974 data were used in your evaluations?

A I think there is always that chance, yes; I could not answer that it has no chance.

Q Sure.

CHAIRMAN JENSCH: Just a moment: I wonder if I understood correctly one of your previous answers. I think the question was, are the 1974 data better than the 73 data; and I thought you said you weren't as familiar with it, the 74, as you were with the 73?

WITNESS VAN WINKLE: That is correct.

jrb48

CHAIRMAN JENSCH: Then this last question, in which you said something might be different if you used the 74 data, how do you know that if you are not familiar with the 74 data?

WITNESS VAN WINKLE: I think I am answering out of somewhat of a theoretical framework, that any new data could always cause one to revise one's opinions.

CHAIRMAN JENSCH: There's always a possibility, but you can't say there's a probability?

WITNESS VAN WINKLE: Okay.

CHAIRMAN JENSCH: All right, thank you.

BY MR. TROSTEN:

Q At this point I gather from your previous answer that you are not able to say how much of a change in your assessment of impact would result from your examination of 1974 data?

CHAIRMAN JENSCH: If any.

BY MR. TROSTEN:

Q If any?

A (Dr. Van Winkle.) That's right.

Q Do you think, Dr. Van Winkle, that the 1974 data would provide a better basis for the Staff's analysis? Is there any reason why you think it would provide a better basis for the Staff's analysis?

CHAIRMAN JENSCH: Excuse me, that last question --

jrb49

what did you say? Why do you think 74 data would be better?

MR. TROSTEN: No, I asked him if there was any reason why he thought that the 1974 data would provide a better basis than the 1973 data.

MR. LEWIS: I object. You have not established that that is what he thinks.

MR. TROSTEN: I am just asking him. I'll be very specific about it; I am in no way trying to mislead Dr. Van Winkle.

CHAIRMAN JENSCH: I think it's a premise he has not adopted.

MR. TROSTEN: Dr. Van Winkle certainly has a general familiarity with the 74 data; he is not as familiar with them as he is with the 1973 data; however, what I am really asking him, Mr. Chairman, is whether on the basis of his general familiarity with the 1974 data, and his much more detailed familiarity with the 1973 data, there is any reason in his view why the 1974 data would provide a better basis for the Staff's evaluation of the impact of once-through cooling on the Hudson River.

That is the question.

WITNESS VAN WINKLE: Based on my present familiarity with the 1974 data, I have not seen that much evidence that would cause me to revise the evaluation that is incorporated in the Indian Point 3 FES.

jrb50

However, certainly one advantage of the 74 data is that it provides us with an independent post-operational, plant operational, data set in addition to the 1973 data that we have not looked at. So in that sense it is clearly of value.

Quite frankly, based on what I have heard since this hearing started, I find indications of more important pieces of information from the 1975 studies than I do in the 1974 studies.

CHAIRMAN JENSCH: I think you said in the last answer the FES was Indian Point 3? You meant 2?

WITNESS VAN WINKLE: No, I meant 3.

BY MR. TROSTEN:

Q Now, from your detailed familiarity with the 73 data, would you say that there are any flaws or inconsistencies or imperfections in the 1973 data?

A (Dr. Van Winkle) That's a pretty broad question.

I think that I will not attempt, because in this form, I don't think I could very easily give an all-inclusive answer. I think what I might try to do is just highlight a few areas.

Q Let me be sure you understand my question: I am not asking you to state what they are; I am just asking you if you know whether they exist; that's all.

A Yes.

jrb51

As far as I am concerned there wereproblems issues, that were certainly not adequately resolved through the 1973 data that I felt could have been more -- could have been better addressed.

Q Thank you.

Have you, Dr. Van Winkle, examined -- excuse me; let me rephrase that.

I understand, Dr. Van Winkle, that you have not examined Con Ed's 1975 data, is that correct?

A That is correct.

Q Recognizing that since you have not examined them, this, then, would have to be a theoretical question; I nevertheless ask you:

Could the Applicant's 1975 data be better in quality by a significant amount than the 1973 data?

CHAIRMAN JENSCH: The possibility? Could it?

MR. TROSTEN: Yes, theoretically, it's a theoretical question.

WITNESS VAN WINKLE: Yes.

BY MR. TROSTEN:

Q I would like to turn to a closely-related line of questions, Dr. Van Winkle, which has to do with what the 73, 74, and 75 data show about the biological situation in the river, in the Hudson River; okay? That is what I am talking about.

jrb52

Now, aside from their general quality for impact purposes, would you say that the 1974 data depict a biological situation which is significantly different from the 1973 situation in the river?

A (Dr. Van Winkle) Well --

MR. SHEMIN: I am going to object to that question as being overly-broad. At any different moment in time, instantaneously, in the real biological world, depicts a different situation; and I think that in the context of the Hudson River Estuary, and two years' difference, that a question: is there a different biological situation in one year, as opposed to another, is so broad as to be a meaningless question.

MR. TROSTEN: Couldn't Dr. Van Winkle decide if he understand the question that perhaps Mr. Shemin doesn't understand?

CHAIRMAN JENSCH: Well, let me try: what do you mean by "biological situation"? I'm not somebody's attorney.

MR. TROSTEN: Fundamentally, whether there are events occurring in the river such as different freshwater flows, different spawning distribution, different temperature regime in the river, which affect the spatial and temporal distribution of ichthyoplankton in the river, for example; I am sure Dr. Van Winkle is aware of many other situations. That's basically what I am talking about.

jrb53

MR. LEWIS: Would you like him to address those specific aspects?

MR. TROSTEN: No, I really would like to have Dr. Van Winkle on the basis of his expertise state what he feels from his standpoing are significant biological events in terms of once-through cooling whether the biological situation was significantly different in 1974 than it was in 1973.

CHAIRMAN JENSCH: Do you understand the question?

WITNESS VAN WINKLE: Yes, I do.

I am not sufficiently familiar with the 74 data to answer that.

BY MR. TROSTEN:

Q Thank you.

Dr. Van Winkle, I want to call your attention to the -- to our testimony on page 22. On page 22 you will note that there is a summary of entrainment-impingement and total impacts for Indian Point 2 during the years 1974 and 1975; and you note that the entrainment impact is 0.52 percent, and the impingement -- and the entrainment impact for 75 is 0.54 percent. So this contrast is drawn between the entrainment impact as estimated by Con Ed during this two years.

You note, of course, that that relationship is

jrb54

is a 104 percent relationship of the 1975 impact over 1974 impact.

Now, would you say that the 4 percent difference in impact is a significant change in impact from a numerical standpoint?

A (Dr. Van Winkle) I did not follow your arrival at the 4 percent.

Q It is simply the ratio, the relationship, of 0.54 and 0.52, that's all.

A So you are talking about an incremental, a .02 percent is 4 percent of the 74 reference?

Q Exactly?

And what I am asking you is whether a 4 percent change, which is what this shows, from 74 to 75, is -- whether you regard that as a significant change in impact from a numerical standpoint?

Is that number really significant? Are those numbers significantly different, is what I am asking?

A Two comments: first, I guess I would prefer if you were posing this question with reference to, rather than Indian Point percent reduction, that multi-plant percent reduction.

Q I will in a minute; I am going to.

A My own feeling is to focus on a single plant in this way, it's somewhat of an academic exercise.

jrb55

Q I agree with you, by the way, Doctor.

CHAIRMAN JENSCH: Go ahead.

WITNESS VAN WINKLE: The second point is I am not I guess this percent of a percent scale exercise -- I think it's both somewhat confusing, also somewhat misleading

I think I would rather address the question of whether the .02 percent change is of importance -- to which I would say, no, it isn't.

BY MR. TROSTEN:

Q Yes, right.

Now, turning to the graph you show on page 7-9A of the Final Environmental Statement, Staff Exhibit OT-1, you will note there that the graph shows that the cooling water flow rates for the Hudson River -- and these are anticipated flow; is that not correct?

A (Dr. Van Winkle) Pst -- I would guess, I think this graph was drawn in 75, and I would expect it only reflects actual cooling water flow rates through 1974; past that, it is projected.

Q Through 74.

I don't have the exact percentages, assuming these are actual flow rates -- are you able to state, do you know, offhand, Dr. Van Winkle, what the percent increase is from 1974 to 1975 of flowrates? I judge it is probably about 40 percent; is it on that order?

jrb56

A According to this graph, I would say that's approximately correct, although I think I would feel more comfortable since these are years that have occurred that you could actually get -- I mean, for instance, like Indian Point 1 is included here; and I think during the years you are talking about, I think Indian Point 1 wasn't operating.

So that this graph -- anticipating the direction of your questioning -- I think your questioning might be more properly based if we were dealing with the actual incremental flow that occurred during this interval of time. And I offhand don't have that information.

But I am willing to concede that there was a jump, an appreciable jump in flow. I don't know what the percentage is.

Q Right.

Dr. Van Winkle, did you write the section in the Indian Point 3 Final Environmental Statement, which I believe is quoted and used again -- yes; look on page 5-1 of Staff's Exhibit OT-1, and in Section 5.2, you will see a quotation from the Indian Point 3 Final Environmental Statement, which is essentially adopted, as I understand it, in this FES.

And it uses the phrase, "a quantum jump", "if there is to be a quantum jump in ability"; and I think the phrase probably appears elsewhere in Indian Point 2's FES

jrb57

Is that your phrase?

A Yes.

Q Right.

Let me ask you this: do you consider that the increase in cooling water flows that are depicted on Figure A-1, page 7-9A of Staff's Exhibit OT-1, that that increase is a quantum jump in cooling water usage?

MR. SHEMIN: I object. "Quantum jump" was used in connection with ability to forecast an impact; but now he talks about a quantum jump in power plant withdrawals; the two have nothing whatever to do with each other.

MR. TROSTEN: Mr. Chairman, can't the witness answer instead of Mr. Shemin?

CHAIRMAN JENSCH: I think what he's trying to do is clarify it, and I think every party is entitled to know what the question is. And if the term is being used in a different sense, I think the witness should have a clear understanding of the fact that a term is being applied in a different way than the quotation which was used as the base of reference.

I think we all have to understand; the Village of Buchanan is entitled to understand the question, as well. And if they don't, they should seek clarification, because the record will have to show what the details are.

MR. TROSTEN: I agree, and certainly Dr. Van Winkle

jrb58 perceives that the phrases are used in different ways.

What I am really trying to do, and the reason why I asked Dr. Van Winkle whether he used the previous phrase, is that, although the phrase is used in my question, and the way Dr. Van Winkle used it is certainly different -- no question about that -- I am just trying to understand really what he means by the term "quantum jump".

CHAIRMAN JENSCH: Well, give him that question; I'd like to know the answer to that one, too.

MR. TROSTEN: What if I would prefer, if I could, Mr. Chairman, if Dr. Van Winkle can answer my particular question --

CHAIRMAN JENSCH: Let's start with the "quantum jump" -- I'll ask it:

What do you mean by the "quantum jump"?

WITNESS VAN WINKLE: Well, --

MR. TROSTEN: In what context, the context of my question?

Is this an abstract question, Mr. Chairman?

CHAIRMAN JENSCH: Everything's been theoretical so far, if I understand his answers -- could something be better than something else? Well, could be, possibly, but in other words you can't say for sure.

WITNESS VAN WINKLE: What I mean by use of the phrase "quantum jump" is in this quotation from the FES

jrb6s

CHAIRMAN JENSCH: Yes.

It's a theoretical approach: if it had been operating it would have been odd.

MR. TROSTEN: Sometimes it's one of these obvious points we don't always keep sight of, and that is the only reason I have brought it up.

CHAIRMAN JENSCH: Maybe you could adopt that as a premise for your question and move on to the next one?

MR. TROSTEN: Moving to the theoretical to the actual, let me ask you this question:

BY MR. TROSTEN:

Q Were any of the data that were collected -- evaluated -- in the Indian Point 2 operating license hearing collected at a time when the Bowline plant was operating?

That is a real question.

CHAIRMAN JENSCH: Where does the record show that? I really think when you are referring to a record, like a document, you should either show him the document or show him the record. Why have him recall?

MR. TROSTEN: Mr. Chairman, I don't have a document to show him. I do know what the answer is. I just wondered if Dr. Van Winkle knows.

CHAIRMAN JENSCH: If you could say it was available, we will accept that statement on your representation as an

jrb69

attorney, and let's go on; because I don't know if this gentleman was even with the Staff or working on Indian Point 2's operating license proceeding.

We'll take your representation of it.

MR. TROSTEN: Could I ask for an answer from anyone sitting at the table, either Staff counsel or witnesses, whether they know whether any of the data that were evaluated and relied upon by the Staff in the Indian Point 2 operating proceeding were collected during a time when the Bowline or Roseton plant was operating -- just a simple question?

WITNESS VAN WINKLE: Bowline or Roseton?

BY MR. TROSTEN:

Q yes?

A No.

MR. LEWIS: I'm sorry, what?

WITNESS VAN WINKLE: Neither of the two units or those sites started operation until after that date.

BY MR. TROSTEN:

Q Thank you very much.

Now, do you know whether the Indian Point, Bowline and Roseton plants were all operating during the 1973 striped bass spawning season?

A (Dr. Van Winkle.) At least I don't believe either Indian Point Units 2 -- certainly Indian Point 3 was not

jrb70

operating. My impression is Unit 2 might not have been operating, although I am not positive about that.

Q Let us say that it was operating part of the time, with pumping operations only, of course; because the operating license had not been issued during the striped bass spawning seas; but it did not operate at power during the striped bass spawning season.

Is that your understanding, Dr. Van Winkle?

A Well, subject to going back to check my records.

Q Subject to check; right.

Now, is it your understanding also that -- let me rephrase that.

What is your understanding of the operating status of the Bowline plants during the 1973 striped bass spawning season?

A My understanding is Unit 1 was operating, Unit 2 was not; that neither of the two units at Roseton were operating.

Q Is it your understanding that Unit 1 of Bowline Point was operating throughout the entire striped bass spawning season? -- during 1973?

A I don't know.

(Pause.)

Q Now, turning to the 1974 data collection year, were these plants all operating in 1974?

jrb71

CHAIRMAN JENSCH: Which ones?

MR. TROSTEN: Indian Point, Bowline, Roseton?

MR. SHEMIN: I am going to object unless the question is directed to whether or not the witness was aware of this information at the time he prepared the FES, or unless it is tied into the witness' present statements as to his opinions; whether he now remembers what he knew then. It is really irrelevant to the basis on which the opinion was written.

MR. TROSTEN: Mr. Chairman, I strongly object to interruptions from counsel.

MR. SHEMIN: It's called an "objection".

MR. TROSTEN: It may be called an objection, but it's a waste of time.

MR. LEWIS: Mr. Chairman?

CHAIRMAN JENSCH: I don't know that statements by any counsel have really been a waste of time anywhere along the line, yours or his; but I think fundamentally that what the Attorney General is raising is really what I understood your question to have really directed to.

Now, if your questions have a broader scope than that, I think you should so indicate.

But does the witness understand now, were these data from these plants considered by you in writing the FES?

MR. LEWIS: Mr. Chairman, if you want, I do have

jrb71

an objection to this question. It is an objection that has been growing out of this line of questioning, which is as follows:

I believe that the difficulty with attempting to get into the record what the operating status of -- I guess we're talking about three different operating stations, and maybe there will be more in subsequent questions -- what the operating status of these stations was in 1973-74,-75, is that I think there is a much better way to get that evidence into the record, by documentary evidence.

The problem is that, as has already been answered by Dr. Van Winkle in response to one question, to the best of his recollection, subject to check, he believes that such and such units were operating, such weren't.

I think it is most inefficient, and frankly unfair to him to attempt to get the record evidence of these points.

CHAIRMAN JENSCH: Maybe this is a good time to take a recess, and if you will assure counsel what precisely you have in mind --

MR. TROSTEN: I will.

CHAIRMAN JENSCH: I think the Attorney General has pointed out that the operating data are really relevant insofar as they have been considered by him for his work.

If he hasn't, then it's not related to the scope

jrb72

of his work.

MR. TROSTEN: Before we take our recess, let me explain exactly what I have in mind.

I want Dr. Van Winkle to understand the point I am trying to make: what I am trying to get at is the -- his evaluation of the 1974 and 1973 and 1975 data in light of his understanding of the operating status of these other power plants. And I want to inquire as to the extent to which he considered the fact that these other plants were operating during those years.

And that's the reason why I am asking this question.

Now, during the recess I will be happy to see if we have the documentary data so the witness can refresh his recollection as to what the status is so we can discuss it, and then we can go on.

CHAIRMAN JENSCH: I think it would be very helpful if you would do that. I think maybe we'd be willing to accept your statement of what you have investigated and found to be the facts, subject to check; and I think then it will move along a lot faster.

As Staff counsel says, to ask the gentleman to recall is perhaps more than he is readily able to do on the stand.

But if you say they were operating, I am sure

jrb73

we will accept your statement, subject to their check of it. And I think it would be very helpful to establish that, as the Attorney General says, and then tie it into his work.

At this time we will synchronize -- I have about 3:15; let us recess to reconvene in this room at 3:25.

(Recess.)

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CHAIRMAN JENSCH: The witnesses have returned to the stand. Will you proceed, Licensee?

MR. TROSTEN: Yes, sir.

BY MR. TROSTEN:

Q Dr. Van Winkle, is it correct that 1975 is the only year in which data were collected on the Hudson River in which the Indian Point 2, Bowline Units 1 and 2, and Rosteon Units 1 and 2 plants were operating?

A (Witness Van Winkle) That is correct.

Q Would you agree, Dr. Van Winkle, that your ability to predict the effect of operating a once-through cooling system on the striped bass population would be improved by your review of the 1975 data?

A Yes.

Q Are you planning to review these data?

A I don't see any way to get out of it.

(Laughter.)

Q Could you tell me, please, what use you plan to make of these data?

CHAIRMAN JENSCH: Wait a minute.

Are these data in the record?

MR. TROSTEN: No, sir. They will be submitted as part of the January 1977 submission.

CHAIRMAN JENSCH: Oh, I see.

There isn't anything, then, in this record that

blt 2

he can review that would improve his ability to predict what your're asking him about?

MR. TROSTEN: There's nothing in this record. I was simply asking whether on the basis of what he knew about that data collection effort.

CHAIRMAN JENSCH: I didn't think it was on the record.

BY MR. TROSTEN:

Q Did you understand my question?

A (Witness Van Winkle) Yes.

CHAIRMAN JENSCH: Are you suggesting that, in order to arrive at a determination in this proceeding, we have to get the 1977 report so he'll have the ability to review and make the prediction you're asking him to predict?

MR. TROSTEN: No, sir, I'm not suggesting that at all. The reason I am asking him this question -- and I have some other questions I want to ask him -- is I am trying to establish through the sorts of studies and the use that Dr. Van Winkle intends to make of them, which is referred to in the Final Environmental Statement, the on-going studies, just how the data will be used and thereby establish the value of tnese data. That's the basis.

CHAIRMAN JENSCH: Proceed.

MR. LEWIS: Is there a pending question?

MR. TROSTEN: Yes.

blt3

BY MR. TROSTEN:

Q The question is: What use do you intend to make of these data -- what types of study, what types of use? Could you summarize that briefly for us, Dr. Van Winkle?

CHAIRMAN JENSCH: Not having seen the data, you're asking him how he's going to use it?

MR. TROSTEN: I believe he knows what I mean. I think he can answer the question, sir.

CHAIRMAN JENSCH: I just wonder, if he hasn't seen the data, how does he know how good it is for him to use?

It seems to me the net result of the presentation is that we should make no determination here until we get the '77 data. You are saying no, you don't want to do that.

What happens to this whole hearing? You say the best data that they could utilize would be the '77 data, and you haven't presented it here.

MR. TROSTEN: No, sir, it isn't that. It's just that Dr. Van Winkle intends to use these data.

One of the benefits that Dr. Geckler cited -- one of the benefits that the Final Environmental Statement cites -- of the Applicant's research program is the presentation of this data, and there is a reference here, for example, to the ongoing analyses that are going to take place.

blt 4

And I would like to ask Dr. Van Winkle what use he intends to make of these data, because these tend to indicate the value of the data.

CHAIRMAN JENSCH: All right. I don't hear any objection. Go ahead and tell what you might do with something you haven't yet seen.

BY MR. TROSTEN:

Q Do you have plans to use this data, Dr. Van Winkle?

MR. LEWIS: Mr. Chairman, I object. I think that what would be an appropriate question is, does he intend to review them?

Is that what you're asking?

MR. TROSTEN: I've already asked him that. He's already answered it. Now I want to know what use he intends to make of them in the ongoing studies.

Dr. Van Winkle, I'm sure, can answer this question. It isn't a very difficult question.

WITNESS VAN WINKLE: I can certainly answer it up to a point, and that on the basis of the testimony submitted at this hearing and the evidence that's been brought out during the course of this hearing that I'm aware of new information in certain important areas.

The first step in the use of that information would be just to become familiar with it and review it.

bt 5

And to an extent subsequent steps in the analysis on any of these issues -- whether it's the cropping factor, the distribution f factor, contributions to the Mid-Atlantic -- would depend on the results of our review of that information.

BY MR. TROSTEN:

Q Is that the end of your answer?

A (Witness nodding head affirmatively.)

Q Do you plan, Dr. Van Winkle, to contrast these 1975 data with the data gathered in prior years, particularly 1973 and 1974?

A (Witness Van Winkle) In this question you seem to be focusing on the riverwide study by year and spatial and temporal distribution.

Q Yes, I am.

A Yes.

Q What is the purpose of this comparison?

A I'd say twofold, that at least two things come to mind immediately.

We have a three-point curve of decreasing power plant flow from 1973 through 1975, and associated with each of those power plant flows we have -- we will have a data set giving us the temporal-spatial distribution of the various young-of-the-year life stages.

WE will carry out an evaluation to estimate the

blt 6

potential impact during each of those years.

And the second part would be to try to resolve the question of how the power plant impact varies from year toyear, depending upon things like fresh water flow, location, the spawning distribution, both in time and even more so in space, questions of this type.

Q Do you think by drawing the comparisons that you have just described that your ability to predict the effects of multiplant operation on the Hudson River will be improved?

A Yes.

Q What practical use do you intend to make of the new information that you derive from this? What use do you intend to make of this information, this new information?

A I'm not clear what you mean by "new information." Do you mean your new information or the results of our analysis?

Q The results of your analysis.

A I think that depends to a large extent on various legal proceedings. I mean, ultimately the purpose of our being contracted to keep on top of this, the new data being collected, and of us carrying out our own analyses is to be prepared for possible hearings, et cetera.

Q Now, if the results of your analyses showed you some new information that you consider to be significant, you would bring this to the attention of the Nuclear

blt 7

Regulatory Commission, is that correct?

A Yes.

Q Now, on page 7-3 of the Final Environmental Statement, Staff's Exhibit CT-1, you refer to a number of ongoing analyses in the last paragraph. There is a reference in several other pages to the ongoing analysis.

Do you see that, sir?

A Yes.

Q Are you a member of the Interagency Task Force that the Staff counsel referred to in an exchange at a prehearing conference that I referred to a moment ago?

A Yes, I am.

Q Could you tell us, please, who are the other members of the Interagency Task Force?

A Would it be adequate if I just identified them by name and affiliation?

Q Name and affiliation, yes.

A This is a fairly lengthy list, and some of these people are quite active and others not so active.

Q Do you have a document you'd just care to submit for the record? It would be helpful if we could hear it.

MR. LEWIS: Do you want specific names or agencies?

MR. TROSTEN: Specific names and agencies.

WITNESS VAN WINKLE: The chairman of the Technical

blt 8

Committee is Harvey Noonanfeldt, EPA, Region II. Other people on this Technical Committee from EPA are Joe Hornbeck, Barry Cohen, Thomas Bixler, Barbara Pastalov, Lee Warren, Pat Harvey, Richard Frye, Lee Tiebow, who's with the Environmental Protection Agency, Southwest Environmental Research Laboratory.

Department of Commerce, there are three people. Mr. Crestin --

MR. TROSTEN: How do you spell that?

WITNESS VAN WINKLE: C-r-e-s-t-i-n.

Mr. Ossiander, O-s-s-i-a-n-d-e-r, Dr. Hanks.

From NRC-ERDA --

MR. TROSTEN: NRC and ERDA?

WITNESS VAN WINKLE: NRC and ERDA.

Dr. Phillips, whose with NRC, Environmental Specialist Branch; Dr. Hayward Hamilton, whose with ERDA; myself; Dr. Sid Christiansen, who's also from Oak Ridge.

There are four people from the Department of Interior: Dr. Al Eiper, Dr. Philip Goodyear, Mr. John Borman, Mr. Bill Knapp.

There are two people from the California Department of Fish and Game: Mr. Charles Fullerton, Mr. Harold Chadwick.

There are two private consultants: Dr. Edward Carpenter and Mr. William Doble.

CHAIRMAN JENSCH: Is that the complete list?

blt 9

WITNESS VAN WINKLE: That's all.

CHAIRMAN JENSCH: What is this Interagency Task Force? Does it have anything to do with the Hudson River?

MR. TROSTEN: Yes, sir. According to the Staff counsel, this Interagency Task Force is studying the Hudson River fishery and has been receiving on an ongoing basis much of the data that is being submitted by Con Edison in this proceeding.

CHAIRMAN JENSCH: Thank you.

WITNESS VAN WINKLE: If I might clarify the charge of this group, it's case preparation for upcoming hearings in litigation on the 316-B permit for Roseton, Bowline, and Indian Point.

BY MR. TROSTEN:

Q Does this Task Force have responsibility with respect to the NRC's proceedings with regard to Indian Point 2?

A (Witness Van Winkle) No.

Q According to Staff counsel, Dr. Van Winkle, the Interagency Task Force has been receving on a preliminary basis much of the data that are being made available in connection with Con Edison's Hudson River research program. Could you tell me the following things concerning the Interagency Task Force?

What are the ongoing studies that the Task Force

blt 10

has in being at the present time?

A I spoke to Mr. Fidell earlier about having stopped by NRC and copying some of the material, the list of on-going studies, but mine is not here.

CHAIRMAN JENSCH: If you already have that, perhaps you could read it into the record instead of asking him to recall something.

Let's move it along here. If it doesn't have anything to do with NRC hearings -- it's 316 exemption proceedings, as I understand the witness now.

MR. TROSTEN: Mr. Chairman, I'm going to read into the record an excerpt from a draft of the Final Environmental Statement which we obtained from Staff counsel pursuant to a discovery request.

What I am reading from is a draft of material which eventually became the material that becomes at the bottom of page 7-3 of the Final Environmental Statement, Staff's Exhibit OT-1.

If the Board will observe, that section states:

"It is obvious from the comments of the Hudson River Fishermen's ASsociation--" et cetera.

And it goes on there. It says:

"The Staff's response addresses the following two topics: (1) the distinction between the benefit of additional data and the benefit of completing

blt 11

ongoing analyses; and (2) the responsibility of the Staff to base its decision on the most complete and scientifically sound analyses that can be made available within an acceptable time frame and without incurring unacceptable incremental damage to the environment."

In the version which appeared in the draft, there was another section which was deleted in the final version. The section was entitled "A Listing of Ongoing Analyses by the Staff and Other Governmental Agencies."

In other words, between the subsections (1) and (2) that I just read to you, there was another subsection which was deleted in the final version.

I'll read into the record now the list of the ongoing analyses by the Staff.

CHAIRMAN JENSCH: By the Staff or the interagency group?

MR. TROSTEN: By the Staff.

"The Staff is preparing the following reports and papers. (1) critique and sensitivity analysis of the compensation function used in the LMS Hudson River striped bass models (ORNL Technical Memorandum); (2) sensitivity analysis of the LMS tidal-averaged one-dimensional transport model of the Hudson River striped bass population (ORNL Technical

blt 12

Memorandum); (3) a generalized fish life cycle population model and computer program (ORNL Technical Memorandum). This model will be applied to the striped bass, white perch and tomcod populations in the Hudson River; (4) development of a stock-recruitment model for assessment of power plant effects on fish populations (papers to be published in the proceedings of the Conference on Assessing the Effects of Power Plant-Induced Mortality on Fish Populations, May 1977, organized by Oak Ridge National Laboratory); (5) alternative methodologies for estimating the probability of surviving entrainment. In addition, work is progressing on comparing the LMS and ORNL tidal-averaged one-dimensional transport models on the Hudson River striped bass population, with special consideration on how compensation is handled in the two models and the problems of validation of transport models with field data.

"Subsection b. By Other Agencies: (1) modeling of alternative compensatory mechanisms. The Department of Interior, Fish and Wildlife Service, National Power Plant Team; (2) contribution of the Hudson River striped bass to the Atlantic Coast fishery, Department of the Interior, Fish and Wildlife

b1tl3

Services, National Power Plant Team --"

Is the National Power Plant Team the so-called Interagency Task Force?

WITNESS VAN WINKLE: No.

MR. TROSTEN: It's a different group?

WITNESS VAN WINKLE: The National Power Plant Team is in the Fish and Wildlife Service, Department of the Interior, and Mr. Borman and Mr. Goodyear are the two people whose names I mentioned that are on the Task Force that are from the National Power Plant Team.

MR. TROSTEN: Thank you.

"(3) a critical review of compensation in fish populations, Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fishery Service; (4) evaluation of power plant f factors, Environmental Protection Agency and State University of New York."

BY MR. TROSTEN:

Q Dr. Van Winkle, are those all the studies you can think of now that are underway now by the Staff or other agencies that you have in mind, or that Dr. Geckler has in mind, when you refer to ongoing analyses in the draft version of the Statement and in the final version of the Statement?

A (Witness Van Winkle) Yes.

CHAIRMAN JENSCH: May I ask, while there's a

b1t14

pause, what is the relevance of this? Can you tell us your point of view?

MR. TROSTEN: Yes.

CHAIRMAN JENSCH: As I understand this proceeding, the Licensee had undertaken the burden to say they should get a 2-year extension of once-through cooling.

MR. TROSTEN: Yes, sir.

CHAIRMAN JENSCH: Now, you have referred to the fact that the Staff has carried on some studies.

MR. TROSTEN: Yes, sir.

CHAIRMAN JENSCH: Is it your thought that those studies should also carry the burden; they've got to have some burden to present in this proceeding?

Now, they may be studying many things that will constantly factor in and correlate or reevaluate different approaches they are making, but the real issue here for us in this proceeding is to see what you have presented now, now what you're going to bring in in the January 1977 report.

It seems to me every time you refer to the 1977 report you make what you are presenting here worse than ever, because you say it's going to be so good in 1977. We're not interested in the fact that Dr. Van Winkle is part of a group that's got a raft of studies going on, because it doesn't help you carry your burden, as I see it. Now, how do you feel about it?

blt15

MR. TROSTEN: Mr. Chairman, as you know, the purpose of our application was to allow us to have an additional year to provide an opportunity for this agency to consider the information that we have gathered before an irretrievable commitment is made to a cooling tower and the environmental and economic impacts, which are massive, are incurred.

It is our position, and it has been our position all along, that the Nuclear Regulatory Commission did not have adequate data upon which to make a reasoned decision and that those data need to be considered before such a decision is made.

That is our position. That has been our position. It is our view that these studies -- we certainly believe that these studies are not being conducted for a useless purpose. They are being conducted for a purpose that the Nuclear Regulatory Commission Staff and other federal agencies consider to be very important, and what that purpose is that they believe --they presumably must believe, because they are conducting these studies -- that there needs to be more information gathered and more needs to be known before an irretrievable commitment is made to this type of a situation.

And we think these are extremely relevant to the point of view.

blt 16

It's unfortunate, I might add -- I would say that the Final Environmental Statement would have been a better document had this draft been included in the final version. But, be that as it may, we now have the information, and it is available to this Board.

CHAIRMAN JENSCH: You concede, then, that you do not have a burden yet established, you haven't carried the burden fully to justify the 2-year extension, because you're referring to the Staff studies that are still going on or the interagency report that's related to a 316 exemption that you're seeking from EPA.

MR. TROSTEN: No, sir.

CHAIRMAN JENSCH: We're faced here with the net result of everything being pushed aside either for the studies that are going on for the interagency report or the continuing studies that the Staff makes on several subjects.

They've got the emergency core cooling studies going on at this time. They have transient without scram studies. They have all kinds of studies, but that doesn't help you carry your burden in this proceeding, as I see it.

MR. TROSTEN: Mr. Chairman, as you will recall, the purpose of this proceeding is not to decide the question of whether we should have once-through versus closed-cycle cooling.

blt 17

As we have always stated, and as the existence of these studies and the massive expenditure that is represented by these studies clearly evidences, the time necessary to review our application which we expect to submit is going to be a long one. There's going to be a considerable amount of effort that is going to have to be devoted to this.

Our position has been and remains that we have presented sufficient information to this Board to justify on a NEPA cost-benefit balance the allowance of an additional year of once-through cooling to enable the results of this study to be considered, and that is what the relevance of this is.

CHAIRMAN JENSCH: You're certainly entitled to make the presentation, but the problem I have is going through this list of Staff studies, which is just a part of the general program of the Staff. The Commission is constantly carrying on studies on many aspects, not only of safety but of environment, and the existence of studies doesn't prove that there is anything that helps carry your burden for you in this proceeding.

Perhaps it will be shown in the course of the proceeding, but I haven't seen it yet. I didn't quite understand the relevance of a lot of these studies.

Will you proceed?

blt18

MR. SHEMIN: Mr. Chairman, I'm not clear on this. I'd like to know so I won't interrupt cross-examination.

Are these Staff studies, or are these studies being performed by members of the Interagency Task Force to be used in the 316 hearings before EPA? I wasn't clear which they were.

WITNESS VAN WINKLE: The ones being performed by the Staff, meaning by personnel at Oak Ridge, I'd say, have an obvious dual purpose.

One is as members of this EPA Interagency Committee; the other is in preparation for our commitment, ongoing commitments, with NRC relative to Indian Point.

MR. SHEMIN: I'm just trying to recollect. Did the list include studies by other agencies besides NRC?

WITNESS VAN WINKLE: Yes, it did.

BY MR. TROSTEN:

Q Dr. Van Winkle, do you intend to apply any of these studies to a review of the information that will be contained in the so-called January 1977 report? Do any of these studies pertain to the information that will be submitted to the Commission, as you understand it, in the January 1977 report?

A (Witness Van Winkle) Certainly in part, yes, although mainly I can see the January '77 report just adding additional analyses on top of those.

blt19

Q Additional analyses?

A That's right.

Q Thank you.

CHAIRMAN JENSCH: While there's a pause, except for some minor differences that I detect in your expressions, I would think you were reading from the script of the 1973 operating license proceeding, because you were wanting more time, more time. We'll have it again when the '77 report comes in.

There will never be a time, as I understand your presentation, a time when everybody will know everything about the Hudson River, so we have to make some decisions now with the best that we have.

If you haven't presented enough in this proceeding to get a 2-year extension, you can come in next year and ask for another try at it, but it's always chasing that will-of-the-wisp to say, "All we need, by George, is just a few more years."

I think the Hudson River Fishermen's Association read something in the operating permit hearing that by '76 the decks would be cleared and everything would be ready to go. And now we come in, and we have a complexity that looks like it will never be resolved.

MR. TROSTEN: Mr. Chairman, Con Edison has always stated, and continues to state, that when the January

blt20

1977 report is prepared and is submitted there will be available to the government agencies involved a basis upon which a decision can be made.

CHAIRMAN JENSCH: We should postpone this hearing, then?

MR. TROSTEN: No, sir, we don't feel we should postpone this one.

If the Indian Point 2 operating license were worded differently, then a different situation would be presented, sir. We have a situation where we're operating under certain constraints, and certain difficulties are presented to Con Edison with respect to this. That's the reason why we're faced with this very, very narrow situation here.

We live in a world of uncertainty, as I said before, Mr. Chairman, and we never expect that all things will be answered; but we feel that when we have submitted the January 1977 report that will be the time when a full evaluation of this data can be undertaken.

CHAIRMAN JENSCH: Proceed.

BY MR. TROSTEN:

Q Dr. Van Winkle, could you tell me, with respect to the studies that are being undertaken by the Staff which I have listed for you, what you expect to accomplish with each of these studies?

blt21

We can go down the list.

MR. LEWIS: Why don't you read one at a time?

BY MR. TROSTEN:

Q Let's start with the first one: critique and sensitivity analysis of the compensation function used in the LMS Hudson River striped bass models.

Would it be helpful for you if we provided you a copy of this list so that you could refresh your recollection of it?

A (Witness Van Winkle) Yes, it would.

(Document handed to the witness.)

A The hope was that the titles themselves would sufficiently indicate both the nature and the purpose of the work.

In the case of that first one, you know, a one-sentence statement of what the purpose and intent of that work is is in essence given by the title.

Q I take it, then, that what you intend to do is to give further study to the phenomenon of compensation as it is depicted in the various -- in the LMS Hudson River striped bass models, is that correct?

A That is correct.

Q Do you feel, then, that more study needs to be given of this analysis before you can determine whether the Staff's present position on this should be changed?

blt22

MR. LEWIS: Objection. The Staff's present position on what?

MR. TROSTEN: Excuse me. Dr. Van Winkle's present position.

MR. LEWIS: On what?

MR. TROSTEN: On the use of compensation -- of the compensation function in the LMS Hudson River striped bass model.

WITNESS VAN WINKLE: I guess one of our purposes here is that we are not overly enthusiastic about the choice of the compensation function that LMS has used, and we have made that known. We felt that perhaps a more effective way to communicate our reservations was to carry out our own study, both criticizing the function by carrying out a sensitivity analysis of one of the models in which it was used and also criticizing the underlying foundations for that particular type of function.

BY MR. TROSTEN:

Q Is this study simply an effort to justify a position that you have taken, or is it a study in which you are approaching it with an open mind?

MR. LEWIS: Objection. Argumentative.

MR. TROSTEN: Let me rephrase the question.

BY MR. TROSTEN:

Q Do you think that upon the review of the results

blt23

of this study that your position might change concerning the use of the compensation function in the LMS Hudson River model?

A (Witness Van Winkle) That particular study has already been finished.

Q It has?

A Yes.

Q I see.

Is it available?

A It's at the printer's.

Q I see. When will it be out?

CHAIRMAN JENSCH: January 1977?

(Laughter.)

MR. TROSTEN: All right. Let's go on to the next one.

BY MR. TROSTEN:

Q Sensitivity analysis of the LMS tidal-averaged one-dimensional transport model of the Hudson River striped bass population.

Could you tell me what objective -- is this finished? Is this one finished?

A (Witness Van Winkle) No.

Q Okay.

When do you expect to finish this one?

A It depends on when your January 1977 report arrives.

blt24

Q In other words, you intend to take the information in the --

A It's more that other tasks are undoubtedly going to compete with this one.

Q Oh, I see. I'm sorry.

Could you tell me what the objective is of the sensitivity analysis? I can't tell by looking at it just what you intend to accomplish by it.

A The purpose of the sensitivity analysis is to select the five, six important parameters or inputs to the model and systematically to go through a series of model runs to evaluate the effect that variations of these input parameters has on the model output, the percent reduction values.

Q Do you think as a result of performing this sensitivity analysis that your ability to predict the impact of once-through cooling systems on the Hudson River will be significantly increased?

A The answer to that question requires a definition of "significant." Let's just leave it that certainly we will have a better grasp of how this model -- what this model has to attribute, some of its uncertainties, et cetera, what contribution it has to make in trying to arrive at an estimate or range of estimates of what the impact may be.

blt25

Q The third one is a generalized fish life cycle population model and computer program.

Now, what is the purpose of this generalized fish life cycle population model and computer program?

A. This is taking off from what we call the ORNL striped bass life cycle model as a starting point, and it's been generalized in the sense that we would be able to easily plug in the life cycle parameters for other fish species.

In particular, we intend to look at both white perch and tomcod populations in the Hudson.

It has been modified and expanded in the sense that we have added a detailed young-of-the-year subroutine, which, instead of treating the young-of-the-year as just a single box that goes from eggs to yearlings, it has the six life stages that we have in our young-of-the-year transport model; and we have incorporated provision for compensatory functions for each of these young-of-the-year life stages. And we plan to examine, you know, for each of these three populations, but undoubtedly for the striped bass in particular, the implications of tradeoffs between fishing compensation, which is what we rely on at present as our surrogate for all compensation mechanisms, to balance that or compare that with the other alternative of incorporating compensatory functions in the young-of-the-year life stages.

blt25

Q And when do you think this one will be finished?

A I think in this case, you know, we will get as much done as we can get done, and undoubtedly we won't get everything, like we might not get all three fish populations treated, before we have to go to EPA hearings or some other hearings.

This is a long chain of subprojects here that we have in front of us, and we'll get as many done as we can, doing those first that we feel are most important.

Q Do you expect to finish them in calendar year 1977, for example? Is that what you anticipate?

A I think there's a potential here for model development and application that extends well beyond that.

Q I'm sorry, but I don't recall what your answer was to my question about the sensitivity analysis. Did you say when you thought you might finish the sensitivity analysis of the LMS tidal-averaged one-dimensional transport model?

A The further away the deadline for the report is, the harder it is to project with any reliability when it may be finished.

Q That's a problem with reports. I know that.

A Yes. It certainly is not going to be within the next three months.

Q Now, turning to the development of the

blt26

stock-recruitment model for assessment of power plant effects on fish populations, here you refer to a paper, I guess, that you intend to have ready for the May 1977 Oak Ridge conference, is that right?

A That's correct.

Q Finally, I guess you have alternative methodologies for estimating the probability of surviving entrainment. Now, would you please describe that? I can't tell what that is.

A That is basically a paper analysis, theoretical treatment, of -- well, starting with a relatively complicated expression for the probability of surviving entrainment which includes consideration of things like differential net mortality and a number of other factors that in actuality we, meaning NYU and other people at other power plants, just tend to make assumptions about.

In other words, many times we assume that net mortality in intake is the same as it is in the discharge, and the approach is, starting with this general formulation, is to assess potentials for error in arriving at an estimate if you do make assumptions that certain things you can't easily measure are in fact equal or you treat them as known and you make assumptions about certain values, how much error you introduce in your final estimate of the probability of survival upon entrainment.

blt27

Q Do you think that the information which has been offered in evidence earlier in this hearing about the likelihood of differential net mortality at the intakes and at the discharges is a significant new insight into the subject of entrainment mortality?

A I think the results -- the fact that there was net mortality and the fact that net mortality undoubtedly increased with increasing velocity, I think, is something that intuitively all of us felt was probably the case.

What the NYU study has provided us with is some preliminary estimates of the magnitude of this dependence of mortality upon the velocity.

Q If more time were available for a study of this phenomenon and adequate testing were able to be performed, is it possible that the prior estimates of entrainment mortality might be very substantially reduced?

A That possibility certainly exists, yes.

CHAIRMAN JENSCH: Are you able to express any probability estimate about it at the present time?

WITNESS VAN WINKLE: All I can point to is the same things that the rest of us here have already seen, and that is that one value in the table we looked at this morning, which is 0.73, and with adjustment based on the preliminary NYU data I believe that it went to 0.38.

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We see also preliminary estimates from these larval table studies that have been done in Roseton and Bowline. This is what I call suggestive evidence that is certainly relevant and has a potential of altering our previous estimates of the mortality upon passage through the plant.

CHAIRMAN JENSCH: Thank you.

BY MR. TROSTEN:

Q Dr. Van Winkle, of course, the whole point in all of these analyses is to determine how many of these young life stage fish are killed by passage through the plant. If they're not killed when they go through the plant, that fundamentally alters the estimate of impact. Isn't that right?

A (Witness Van Winkle) That is correct. It depends on the degree to which your estimates of the cropping factor are altered.

Q Yes, of course.

A As we're all aware, it's one of the parameters, both in the models and in reality, which are going to have a very direct effect on the impact of the power plants.

Q Thank you.

Now, turning to subcategory b., I refer you to modeling of alternative compensatory mechanisms. Are you familiar with that modeling effort that's going on?

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A Not other than by title.

MR. LEWIS: Which agency is that?

MR. TROSTEN: It's Department of the Interior.

MR. LEWIS: Mr. Trosten, do you intend to go through the rest of the list with respect to the other agencies as well?

MR. TROSTEN: Yes.

MR. LEWIS: Because obviously the Staff efforts Dr. Van Winkle was in a position to characterize to you at some length. I'm just trying to get an idea as to whether you're trying to establish now the degree of his knowledge of the studies of the other agencies.

MR. TROSTEN: I will simply ask Dr. Van Winkle this question.

BY MR. TROSTEN:

Q Are you familiar from your participation as a member of the Interagency Task Force in general terms with what the nature of these efforts are by the other agencies that are described in subcategory b. in this document that your counsel has provided?

A (Witness Van Winkle) In the case of the first three, I don't know anything more than the title. I have not seen any drafts or preliminary statements, and I don't know what deadlines have been set there.

Q All right.

b1t30

What about category (4)?

A In the case of (4), I have seen a draft. I don't know what the final deadline is on that report.

Q What is the purpose of the category (4) evaluation?

MR. SHEMIN: Mr. Chairman, I cannot see the relevance of any of this, frankly, to the question as to whether Con Edison has at this point established that it has enough of a different case than it had three years ago to permit an extension. I don't see what relevance at all even the Staff's reports has to that question.

They're going to present those to the extent that they can at any hearing that comes up in the future, and they're not asking for an extension so that they can complete those reports.

The studies that we're talking about have basically all been completed in terms of data gathering. I still am not clear, despite Mr. Trosten's earlier statement, what exactly is relevant about these reports.

MR. TROSTEN: Mr. Chairman, I've already answered that question.

I'll state again that what these reports indicate is that there is substantial uncertainty with regard to the true effects of once-through cooling systems on the Hudson River ecosystem and that there is underway a very

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significant effort on the part of the Oak Ridge National Laboratory, the Nuclear Regulatory Commission, and associated agencies to attempt to ascertain what the true effect is of the operation of once-through cooling systems on the river based upon actual operating data of the type that Con Edison has been gathering to submit to the agencies so that this type of decision could be made.

And I submit that the purpose of my inquiring about this is to demonstrate -- is to get on the record what the nature of this effort is and what the level of uncertainty is so that this Board will have before it the true value of the ongoing research so that you can balance this value in the NEPA cost-benefit evaluation.

I will also say that, according to the Staff, one of the benefits of the so-called first year of the proposed extension is that it will allow the Staff and other government agencies and interested parties to finish ongoing studies and to provide a more complete and sound scientific basis for a reasoned decision than was available at the end of 1974, and I'm quoting from the next to the last paragraph on page 3-8.

I can cross-examine with regard to this to see what they had in mind, to see what sort of a benefit they had in mind.

That's what the purpose is. I have to get this

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on the record so that this Board will have this information.

MR. SHEMIN: My objection is that the characterization has nothing to do with what in fact the studies are for. The year has in fact occurred. They are in fact going to be completing these studies.

I do not think they can be fairly characterized as indicative of a belief that the present opinion of the Staff could not stand on its own in the face of a Final Environmental Statement which expresses an affirmative opinion on the part of the Staff.

MR. TROSTEN: Mr. Chairman, I submit that what Mr. Shemin says -- it doesn't hold together. It just doesn't make any sense.

We're talking here about the necessity for further effort. We're talking about a review period.

One of the fundamental issues in this proceeding is what is the period of time that is necessary for review. I submit that what we have already heard on the record in this proceeding is that the Staff has not allowed an adequate time for this review period to go forward and we need to get this evidence on the record. It's very important to our case.

MR. SHEMIN: I'll withdraw the objection if he really wants this information. I was just trying to eliminate the time problem.

blt33

CHAIRMAN JENSCH: The problem that I have, I think the relevance is not clear yet. Perhaps it will be tied in later.

But the presence of ongoing studies, if that were the theme and the guide for a determination here, if you applied that theory to the emergency core cooling system analysis, where studies are going on -- they're carrying on big experiments out in Idaho-- if the studies were going to hold up everything, you wouldn't have any reactors operating in the country because the studies are going on. So the presence of studies shouldn't retard the present status, which is that you have some evidence here which shows not what might be developed in some studies, but what shows now that you should get an extra year after 1980.

I think that's where our real inquiry is in the application you have filed. So while you say, "Have you heard about that crowd over there? They're really going into it now. LMS has come up with some fancy models, I believe, and f factors, and they're running a couple of studies. Is there any worth to it at all," that doesn't mean we've got to stop because they've conjured up some complexity here that no one understands.

Perhaps we won't see any value to it at all. That doesn't mean we're going to stop the wheels. Who knows,

Dr. Lawler may come up with another effects factor or some other combination of the alphabet to compound the situation. We'll have to study that a bit.

So you see, the presence of the study to indicate your rights, as I say, if that theory were worthwhile there wouldn't be any emergency core coolings operating because they're still studying those. But they're not changing the status of anything by the presence of studies, so the presence of studies shouldn't change the status of this situation here.

MR. TROSTEN: Mr. Chairman, I submit there is a fundamental difference between the two situations to which you refer and also a similarity.

The fundamental similarity is that we are in a situation where the question is, is there an adequate data base upon which to allow certain actions or to take certain actions.

That is a fundamental question whenever you're dealing with a regulatory safety matter, and it's a fundamental question when you're dealing with this situation.

Con Edison has maintained from the outset and maintains now that there is no adequate data base on which the Nuclear Regulatory Commission is reporting to require a massive, irretrievable commitment of resources.

CHAIRMAN JENSCH: But you're trying to appeal

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the Indian Point 2 decision, and that opportunity is by. So the question now is what data you have to work under the technical specifications to give you some additional time.

We're not going to go back and say, "Say, let's go back to the 1973 hearings and I'll show you how Lawler's f factors were such lulus then and they're dandy now."

You keep saying the data base for '73 was so inadequate. We can't concern ourselves about that. You could have appealed it.

MR. TROSTEN: Mr. Chairman, we have submitted seventeen exhibits filled with data, and the response is a thin document. And these are the data that are offered on the part of any other party in this proceeding.

CHAIRMAN JENSCH: I understood from this Environmental Statement that they felt that these exhibits you put in the other day, which I think they have indicated have been available to them for review for many years, that was just a "snow job" that you brought in yesterday afternoon, from OT-12 through OT-17 and perhaps prior to that. So it didn't help the cause to fill up the boxes to ship back.

You brought them up, spread them out, and everybody will take a part of them back.

MR. TROSTEN: Mr. Chairman, I sincerely hope

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that no one is suggesting that the evidence which was offered by the Applicant in this proceeding is a "snow job."

CHAIRMAN JENSCH: I understand the FES has reviewed it and hasn't given it the concern that you think they should have.

MR. TROSTEN: In a little while we'll get to the way the Staff reviewed this, Mr. Chairman.

MR. LEWIS: Can I get into this discussion before he gets on with the way the Staff reviewed it?

CHAIRMAN JENSCH: Proceed.

MR. LEWIS: My problem with the inquiry in regard to the list of ongoing studies is that I have no fundamental objection to the establishment of the fact that there are many ongoing studies.

I would object, however, to any inference that flows therefrom that the fact that you have a list of X-number, whatever the number of studies in that, in and of itself raises a justification for any delay.

I think that the appropriate approach to this kind of matter is sort of laid out in the operating license for Indian Point 2 --for example, in 2.c.(1)e., where it talks about the right of the Applicant to come in on the basis of empirical data and request an extension -- points out that the filing of such an application in and of itself shall not warrant an extension of the interim

blt37

operation period.

I think this reflects an attitude that we're going to be seeing in the ongoing studies in connection with applications for extensions of time. I believe the view of the Commission which is expressed there is that we should not allow the mere pendency of all these many applications and many documents to in and of themselves justify extensions.

I'm really concerned about the inference that might arise from merely putting in the record such a list.

CHAIRMAN JENSCH: Perhaps the relevance will show up later, and the purpose of the Board is to reserve judgment.

You may proceed.

MR. TROSTEN: Thank you, sir.

BY MR. TROSTEN:

Q Dr. Van Winkle, referring to the various studies which are ongoing listed in this document we've been talking about, do you believe that all of these studies should be completed before a decision is made whether closed-cycle cooling should be required for the Indian Point 2 plant?

CHAIRMAN JENSCH: Excuse me. May I interrupt?

What wasthe language in the Indian Point 3 decision by the Commission? Didn't it say something about let's have it settled once and for all; it's going to be

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closed-cycle cooling until the Applicant establishes a basis for a different approach to it?

So to ask this gentleman what the Commission will do about a change, I think you're usurping the judgment that the Commission will have to make on the matter.

MR. TROSTEN: No, Mr. Chairman.

Let me say, first of all, this: I don't again want to confuse Dr. Van Winkle. I'm asking him his opinion as a scientist. He is responsible; he is in charge of the Oak Ridge National Laboratory's effort to evaluate the effects of once-through cooling on the ecosystem.

I'm not asking him for his judgment on whether policy determinations require that certain things be done one way or the other. I'm simply asking him for his views as a scientist. I'm not asking him to try to interpret what the Commission meant in the Indian Point 3 decision.

I might add, sir, that there are many provisions in the Indian Point 3 decision by the Commission and in other pertinent decisions that make it absolutely clear that Con Edison is to have an opportunity, an adequate opportunity, to present this program and that there will be an opportunity for this research program to be considered. And I submit that that opportunity is before irretrievable commitments of millions of dollars are made to construct a cooling tower at Indian Point.

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But, in any event, my question is not directed toward the policies or the legal issues. I'm asking Dr. Van Winkle a question in which I ask him his opinion as a scientist.

End 4

CHAIRMAN JENSCH: But, you see, if Dr. Lawler comes up with any more FES factors, and they've got twos tudies running to see whether there was any worth to them, he'll come back with this great ingenuity that he has to cook up some more, and we'll have more studies going to see if there's any value to any of them. As long as he can keep shoving the papers in, and keep studies going, it would stop the wheels. I don't think that's the proper regulatory approach.

MR. TROSTEN: But, Mr. Chairman, if you will, sir, we're not embarked in a process here whereby what we're just trying to do is decide how fast we can build the cooling tower. That's not what we're here to do. We're embarked on a process whereby we're trying to get on the record the question of whether there should be more time allowed.

CHAIRMAN JENSCH: But, you see, that's what I'm saying. Some of these studies are, in a sense, man-made difficulties that Dr. Lawler has brought up; that these fellows have to run the study to see whether there's anything to it. And yet, there's no basis for making any change in what's been established by the Commission. For them to say that we've got to wait for Dr. Lawler to exhaust himself, and we've got to run some more studies, I think we're never going to reach the end of the trail.

MR. TROSTEN: Mr. Chairman, these studies that have been read into the record are not studies that are being

performed by any one other than the Oak Ridge National Laboratory and Federal agencies, and consultants of Federal agencies. All I'm asking for is Dr. Van Winkle's opinion as a professional and as a scientist on this very important question.

MR. LEWIS: Mr. Chairman, you do ask earlier from the Indian Point 3 decision. I think it is appropriate. I have it here in front of me, and I think it's appropriate to read what I think it is you're looking for.

I'm reading a paragraph from page 839 in the RAI, the yellow book which I have in front of me. "Having found the regulatory staff's analysis of the matter adequate for both Units 2 and 3, resolution of the present dispute follows, with the stipulation of the parties and the Commission's rules of practice. No further Commission consideration of the once-through versus closed-cycle question is necessary for either unit. However, pursuant to the stipulation, the Licensee can seek to reopen the matter, based upon empirical data collected during the interim period of once-through operation. Should the Licensee seek to reopen, it would do that by an application for a license amendment. The present Intervenors and other interested persons could participate in that proceeding, and the Licensee would have the burden of justifying the proposed amendment by a preponderance of the evidence."

And then, there are other matters in that sentence. But I think that that is the language you perhaps were searching

for.

CHAIRMAN JENSCH: What I was searching for, it says "the evidence collected" -- past tense, collected. And through out this whole recital, you're referring to something that they hope may come out of some study. But what is the status of this record today? You're looking at horizons all the time, and there's nothing collected.

MR. TROSTEN: Mr. Chairman, I submit that we will, of course, all be writing our briefs about what the Indian Point 3 Commission decision, and other relevant decisions meant. I will simply state now that the language of the Indian Point 3 decision, and the language of the Indian Point 2 operating license, or the language of the relevant Appeal Board decisions, make it absolutely clear that Con Edison is to be afforded an opportunity to present the results of its research program.

CHAIRMAN JENSCH: I wouldn't rely upon the Appeal Board decision for Indian Point 3 for guidance as to what we're going to do here. I think you state that the Commission determination -- I think that's kind of in review of the Appeal Board situation. They have substantially altered the situation as the Appeal Board viewed it.

MR. TROSTEN: Be that as it may, Mr. Chairman, I would simply submit I want to go on and continue to ask these questions of Dr. Van Winkle concerning his opinion on these matters, because I think it's vitally important to our case.

CHAIRMAN JENSCH: I just think you don't understand.

You're trying to make a problem out of what the Commission, or even the staff view is. Can you guess what might happen if some of these studies get done, whatever that shows?

MR. TROSTEN: Well, Mr. Chairman, could he answer my question, please?

CHAIRMAN JENSCH: I thought that was your question.

MR. TROSTEN: No, no. My question was simply this, sir.

BY MR. TROSTEN:

Q Do you believe, Dr. Van Winkle, as a professional and as a scientist,that all of the studies that I have listed contained in the draft staff document should be completed before a decision is made whether closed-cycle cooling should be required for the Indian Point 2 plant?

(Pause.)

A (Witness Van Winkle). I am a scientist, but I'm a scientist operating in a system where there are deadlines for people who need to make decisions. Some of these are more important than others, and we continually try to conentrate on those that are the most important. And undoubtedly, all the work that is here, I'm sure, will not be done in time.

All I can really say is, some of it clearly will be. And we will endeavor to make the most of what we feel is the most significant. But we have precious little control over, you know, when the hearing dates and decision dates are

established.

Q Now, are you saying, basically, that there are certain constraints that are being proposed by policy considerations that you're not competent to deal with, and affect your answer in terms of the amount of time that's necessary?

MR. LEWIS: I think that's a very bad misstatement of the position.

MR. TROSTEN: I withdraw the question.

BY MR. TROSTEN:

Q Now, Dr. Van Winkle, do you feel that any of these studies that I've listed, any one of them -- or any, say, more than one of them, but not all -- should be completed before a decision is made whether closed-cycle cooling should be required at the Indian Point 2 plant? Can you identify the one, or maybe more than one?

(Pause.)

A I don't really have a good answer for that.

Q Does that mean you just don't know? Is that a fair summary of --

A I think so.

(Pause.)

MR. TROSTEN: May we have a five-minute recess?

CHAIRMAN JENSCH: Do you think you're going to finish with the staff tonight?

MR. TROSTEN: I don't think so, Mr. Chairman. I'd

like to move on as fast as I could. It's going to take a little while.

CHAIRMAN JENSCH: How much? Does Mr. Sack have some?

MR. SACK: I think I'm between an hour, an hour and a half.

CHAIRMAN JENSCH: What is the feeling?

MR. SACK: I'm going to ask questions on the environmental impact analysis in the final environmental statement.

CHAIRMAN JENSCH: Related to what particular phase?

MR. SACK: The impact on the cooling system, basically figure 3-1, which I hope to clarify. But it's my understanding that the impact analysis, which the staff contends is the final basis for the determination of once-through cooling, is summarized through this figure 3-1. My questions relate to that.

MR. BRIGGS: Excuse me.

Do you think we should also go through that for the Applicant's, or the Licensee's, analysis? The Licensee has presented numbers of things which he says he thinks justify the delay. And as I look at it, we've not tested that information; we've not tested that analysis. Do you propose to test this one now?

MR. SACK: We propose to test this one because the staff is taking the position that this is the last word that

needs to be said before requiring construction of the cooling tower. I think we are taking a somewhat lesser position as to our data. We are not saying our data is the last word. We are saying our data is the last word. We are saying our data to date is sufficient to justify an extension, to allow time to examine the next set of data. The staff is taking the position that they don't need to know any more.

So, in view of that position, I think it's a crucial point of our case to analyze that position, and see what changes might or could be made to that position, and what assumptions were made here, and what data might supplement in the future.

MR. LEWIS: Mr. Chairman, I don't think it's the staff's position, either, that the last word has been submitted with respect to requiring, with respect to altering the condition that requires, the construction of the closed-cycle cooling system; that we don't need to know any more. I really find it very offensive to hear our position continually characterized in these terms. I mean, it is so far from our position --

MR. SACK: Well, maybe Mr. Geckler should clarify it again. But as I understood the combination of the two staff witnesses, they said that the environmental impact of the extension, even when it was a two-year extension, was insignificant, and would have an acceptable impact. But then they said that, even though this is insignificant, it was serious enough that

it should not be allowed, because they didn't need to know any more.

Now, if that's not the position, perhaps Mr. Geckler should clarify it.

CHAIRMAN JENSCH: What did Mr.Geckler say they did not need to know any more?

MR. SACK: Basically, the quantum jump theory. Mr. Geckler's statement ; where is that?

(Pause.)

"Additional data are not expected to change the staff position"-- I'm quoting from page 4-1 of the FES, the very last two sentences. "Additional data are not expected to change the staff position."

MR. BRIGGS: Is that what you're going to test? Additional data, rather than test the staff analysis?

MR. SACK: There was another quoted here, related. This is page 7-12. "It is the staff's opinion that the probability of showing that a closed cooling system be required is so low that there is little risk that the expenditure of funds for construction of the tower would be unnecessary."

Now, in view of these conclusions, we need to look at the staff position, which it's my understanding -- and I expect Dr. Van Winkle to confirm it -- that the position on impact is reflected in figure 3-1. So I'm going to analyze this figure, and look at what possibilities there are of changing

that impact analysis. The staff has said there is no way they can change that analysis.

MR. BRIGGS: I'm not sure that's quite right.

MR. SACK: It says, "Additional data are not expected to change the staff position."

CHAIRMAN JENSCH: Additional data of the kind you've already submitted probably wouldn't change it. I think they've analyzed what you've submitted; that's all they have done.

MR. SACK: Mr. Chairman, you're adding words to what is written in the document. It doesn't say additional data of one type or another. It says, additional data.

CHAIRMAN JENSCH: Well, I realize it's been a review of your submittal. It must be of the same kind.

MR. SACK: Well, in view of the insignificance of the environmental impact, which they have stated several times, and Dr. Van Winkle has confirmed, there must be some reason for not allowing the extension.

MR. BRIGGS: Well, then, I guess the questions you're going to ask are, what data will change the curves that they get; not how would they get the curves, or why would they get the curves, or what's the sensitivity of the analysis.

MR. SACK: Basically, what assumptions were used, and where subsequent data may eliminate the necessity for some of the assumptions.

MR. LEWIS: Mr. Chairman, earlier, there was an

indication when the cross examination by the Licensee began, that we could perhaps expect cross examination by three different counsel.

MR. TROSTEN: Yes.

MR. LEWIS: I know the Board had indicated a concern. I also have a concern about this. I don't think it's my position that you can't divide up the work somehow, and apparently since you have, I mean, I think what I would like to know is, perhaps you could outline for us who will be cross examining in what areas. I mean, I do have a concern that this kind of thing can get out of hand.

MR. TROSTEN: I understand what you're saying. Let me say exactly what we've done, and how I suggest we proceed.

Now, in order to get ready for this hearing within the time frame involved, and in view of the complete change in the staff's position, we were suddenly faced —

CHAIRMAN JENSCH: We tried to accommodate you in setting up this docket. Let's move it over to January right now.

MR. TROSTEN: No, sir, it wasn't that. We're delighted to have it, and we want to pursue it right through. What happened was that subsequent to the time that the hearing schedule was set -- which we're delighted to have set at this time -- the staff's final environmental statement came out, and the staff abruptly changed from the reasons tht Dr. Geckler gave.

Whereas, when we were suddenly faced with a requirement to cross-examine the staff document, we were able through discovery to obtain certain vital documents from the staff, which were very helpful to us.

So, we then divided up this job. Now, if it were absolutely essential, I could do it myself, but it would take more time, Mr. Chairman, because Mr. Sack and Mr. Fidell have been responsible for this.

Now, the areas that we have been talking about are as follows. I was cross examining in the areas that I have been, and I have some additional cross examination that I wish to conduct. Mr. Sack is going to cross examine in regard to the areas he's just indicated, and Mr. Fidell will cross examine with regard to the benefit/cost analysis, and certain closely related matters.

That's essentially what the division is.

CHAIRMAN JENSCH: I think if we were to go on and recess for about five minutes, you also might think of what date we ought to recess it to January, because it doesn't look like we'll finish tomorrow afternoon. We might as well kind of plan, tomorrow afternoon, to leave at about 3:00 or 4:00 o'clock, and if we don't finish then, why, we'll be glad to receive the suggestion from the Licensee for reconvening in January.

At this time, let's recess to reconvene in this room at 4:50.

(A brief recess was taken.)

CHAIRMAN JENSCH: Please come to order.

(Pause.)

Village of Buchanan, Attorney General of the state -- are they in here? Please proceed.

MR. TROSTEN: Mr. Chairman, I have the following suggestion. We're going to try to move along as fast as we can. I would suggest that -- I'm not suggesting that we kill ourselves this week on the theory that we absolutely can get it done. I feel that we should certainly know by some time in mid-morning, you know, whether we're going to make it by that time. If we absolutely have to adjourn, then we will do that.

The point here is that we have to finish our cross examination. We will certainly move it along.

CHAIRMAN JENSCH: I don't think you should limit yourself. If you feel that this is a matter you want to develop on the record, I feel you should do it. That's all there is to it.

MR. TROSTEN: We have redirect testimony that we have to offer in response tothis. There may be recross, there may be redirect testimony. We have some problems here.

CHAIRMAN JENSCH: It's not critical to limit your presentation at all. You do what you feel you should do. It's your case, and I feel you should do it. And if we don't have enough time, we just don't have enough time. We have to consider

our reporters, too.

MR. TROSTEN: Well, I would suggest we just move along as long as we can and as fast as we can, and we'll see where we are.

CHAIRMAN JENSCH: If we don't finish it, we'll find some convenient date.

MR. LEWIS: Mr. Chairman, if there's one point I might make before the Licensee proceeds with his cross examination; and that is that yesterday, or maybe the day before, when we had the discussion about the selection proceeding, the Board indicated that they were going to get back to the parties and indicate the status of the Board's thinking with respect to the remaining issues in that proceeding. And I was simply going to make the point that this might well be something that we would want to finalize if at all possible during this hearing week, even should this present proceeding have to be continued until a later date.

CHAIRMAN JENSCH: We'll give you word on that in the morning.

MR. LEWIS: Thank you.

CHAIRMAN JENSCH: Will you proceed, Licensee?

MR. TROSTEN: Mr. Chairman, there was something that staff counsel mentioned a few moments ago in response to a comment by Mr. Sack. And that is that to the effect, as I heard them, that the staff did not consider this analysis, whic

is reported in the Final Environmental Statement, as being "the last word." Now, if that is the case, I would appreciate a statement from staff counsel as to just what does he regard this as providing, with particular reference, if you will, Mr. Lewis, to the statement that appears in the Final Environmental Statement that "the staff's opinion is that the probability of showing that a closed-cycle cooling system will not be required is so low that there is little risk that the expenditure of funds for construction of the tower will be unnecessary."

MR. LEWIS: Well, as I understood Mr. Sack's statement, it was that it was the staff's position, in this Final Environmental Statement, that the last word had been spoken on the requirement of a closed-cycle cooling system. Well, I don't think that the requirement of a close--cycle cooling system is the subject of this proceeding. The subject of this proceeding is whether or not to grant a two-year extension.

Now, it was in that context that I objected to that terminology.

CHAIRMAN JENSCH: Proceed.

BY MR. TROSTEN:

Q I have a few more questions for you; not very many, Dr. Van Winkle, withregard to some of these studies. And then I think we can move on. If you can just answer that you're just not that familiar with them, it'll save us some time, perhaps, if that is the case.

Are you familiar with regard to the Category B studies, the studies by the other agencies, if there are any other consulting organizations or contributing organizations other than the ones that are listed?

A. (Witness Van Winkle). I don't know one way or the other.

Q. Do you know when these studies were initiated?

You might take a moment to look that up.

(Pause.)

A. I'd say the first one was initiated maybe a half year ago. The second one has maybe only just been started. The third one, as I understand it, has been ongoing for more than a year. The fourth one, for which there's already a draft, I'd say, you know, has maybe started half a year ago.

Q. Do you know when these studies will be completed?

A. No.

Q. Do you know -- are these drafts of these studies in the possession of the Interagency Task Force, do you know?

A. The only report in both Category A and B for which there is a draft is the first one listed under the staff, A Sensitivity Analysis of the Compensation FUnction Used in the LMS HUdson River Striped Bass Models; and the very last one, Category B, Evaluation of Power Plant f-Factors.

Q. Do you know if the Interagency Task Force keeps minutes?

MR. SHEMIN: Mr. Chairman, I think I'm going to have to object again. I really am beginning to feel more and more that this is a discovery proceeding for the EPA proceeding which is going to be commencing in a few months. Counsel for the Applicant is going to be representing them in that proceeding, and has been observing this proceeding. I'm giving Mr. Trosten credit for that by saying that, because I fail to see what relevance this has to this proceeding.

MR. TROSTEN: Well, Mr. Chairman, actually, if more time had been available, I'm sure we would have wanted to have taken that position.

CHAIRMAN JENSCH: We'll give you time. We'll put it until January right now.

MR. TROSTEN: I just have one or two more questions, Mr. Chairman.

CHAIRMAN JENSCH: I don't want you to limit yourself in any way. But if you do think that time constraint has been a burden to you, let's give it to you. Let's have the record show that you have been limited.

MR. TROSTEN: I don't want to take up the time. I'll move along as quickly as I can. As I say, had I had adequate time to review these documents before this hearing, we could have filed interrogatories and taken depositions, and we wouldn't have had to waste time. But that's just the way the thing --

CHAIRMAN JENSCH: Do you withdraw the question about the minutes, then?

MR. TROSTEN: No, I would put the question to him.

CHAIRMAN JENSCH: What's the relevance of it?

MR. TROSTEN: The relevance of the question is that there are documents, if there are minutes kept; that these minutes may possibly reveal information that would be valuable to us in the proceedings.

CHAIRMAN JENSCH: Objection sustained.

BY MR. TROSTEN:

Q Dr. Van Winkle, do you know when the results of all of these studies are going to be made public?

A (Witness Van Winkle). I'm sure that those that are completed in time for the EPA hearings would be made public at the time of those hearings.

Q What about the other studies that are not, as far as you know, specifically directed toward the EPA proceedings?

A Well, all the information and reports that are being developed here, assuming that they are finished in time, would be submitted, or would be involved in, the EPA hearings.

Q Dr. Van Winkle, if the present extension is not granted, which is the position of the regulatory staff, and construction were commenced on a cooling tower at Indian Point 2, what would be value of the analyses as regards this case?

MR. LEWIS: I don't understand.

MR. TROSTEN: Would you like me to repeat the question?

BY MR. TROSTEN:

Q If the present extension were not granted, which is the position of the regulatory staff with regard to this proceeding, and construction were commenced on a cooling tower at Indian Point 2, what would be the value of these analyses we've been discussing as regards this case?

MR. LEWIS: Objection. I don't think that this question is properly directed to this witness. I fail to see what the commencement of construction of the tower, what relationship that has to Dr. Van Winkle's technical judgment as to the scientific validity or the scientific usefulness of these particular studies.

MR. TROSTEN: All right, Mr. Lewis.

BY MR. TROSTEN:

Q Let me direct the witnesses' attention to a paragraph in the final environmental statement. It appears on page 3-8, and perhaps I should be addressing this question to Dr. Geckler. I'm not sure.

Dr. Van Winkle, if you would refer to the paragraph toward the end of the page, just before Section 3.2.6, the one that has a gap before it, let me read this to you.

It says, "The staff expects that by January 1" -- did you write this section, sir?

A (Witness Van Winkle). Yes.

Q "The staff expects that by January 1, 1977, the Applicant's research program may provide additional relevant results, particularly along the lines of comparing years and of analyzing and synthesizing the data collected both prior to 1972 and since 1972. Furthermore, the first year of the proposed extension will allow the staff and other governmental agencies and interested parties to finish ongoing studies aimed at providing a more complete and sound scientific basis for a reasoned decision than was available at the end of 1974."

Now, when you refer here to the first year of the proposed extension, would you tell me what you mean by the first year? What is the year that you're talking about?

(Pause.)

A Just a moment.

Q Certainly.

(Pause.)

A If I could impose upon your Xerox copy of the notebook.

Q Certainly.

A Is this the -- I need to be oriented.

Q Certainly.

CHAIRMAN JENSCH: Well, does that appear as something that has been rewritten? Let me change the DPS to the FES.

MR. TROSTEN: This appears not to have been changed,

Mr. Chairman.

WITNESS VAN WINKLE: That's what I was checking.

MR. SHEMIN: If you will look at the very next paragraph, it actually says two year instead of one year. So you obviously neglected to change it. The first paragraph had 3.2.6 on the conclusion.

MR. TROSTEN: Yes, there are a number of such things in here. I think it's important that we kind of get our facts.

MR. LEWIS: I think in general, where you find two years in the FES, we meant two years, unless we missed something For example, in 3.2.6, it does mean two years.

MR. SHEMIN: It does.

MR. LEWIS: Yes.

BY MR. TROSTEN:

Q As I say, please take your time on this, Dr. Van Winkle. I'm genuinely puzzled as to what that means.

(Pause.)

CHAIRMAN JENSCH: I should think you should feel free to say if it's just something that was not fully reviewed when they rewrote it, and tucked away in another paragraph.

BY MR. TROSTEN:

Q Dr. Van Winkle, would you like to think about this? You don't have to answer it now, if you'd prefer to -- I realize you may have written this some time ago. Why don't you take that under advisement, and report back later as to what you

have. Would that be all right?

A (Witness Van Winkle). I think I'd just as soon answer now, because I doubt I'd remember what I meant, because I'm not sure I'm going to be able to remember. This was written more than a year ago.

Q Yes, sir. I appreciate that.

A And I have a feeling that I may not have had a very clear picture in my own mind of exactly what 12-month period I might have been referring to there. I think perhaps what I had in mind was that a year would go by, and we were going to be carrying on an ongoing analysis, reviewing year reports. And then, there was going to be a second year of hearings, etcetera, this sort of thing.

Q Dr. Van Winkle, wasn't this sentence written at a time when it was your understanding that a two-year extension was being granted?

A That is correct.

Q Now, if it was written at that time, and the staff's original recommendations had been granted, the Applicant would not have been under any obligation to commence construction expenditures while these ongoing tstudies were going on. Is that correct?

CHAIRMAN JENSCH: That's assuming the Commission has documented this position. That's with that qualification.

MR. TROSTEN: Let me establish a premise here for

Dr. Van Winkle.

BY MR. TROSTEN:

Q If the Applicant's application had been granted, and closed-cycle cooling did not have to be terminated until May 1, 1981, will you accept as a premise that construction expenditures would not have to begin until -- excuse me; excavation would not have to begin until May 1, 1978, and significant construction expenditures would not have to take place until several months prior to that time, say in the beginning of '78.

Will you accept that as a premise?

MR. LEWIS: We'll have to accept that as a premise, because this is obviously not the witness who has informed opinion about that at all.

MR. TROSTEN: I understand that. And I'm just trying to establish whether, perhaps, when he wrote this statement, that he might have had this in mind.

WITNESS VAN WINKLE: I am not, and was not, that familiar with the schedule for construction of the cooling towers. The dates that I was concerned about in my analysis were 1980 versus 1981 versus 1979. Those are the dates that are relevant to my carrying out my assessment.

BY MR. TROSTEN:

Q Right.

Now, with regard to this particular sentence that we've been discussing, there's another aspect of it that I hope

you can explain for me. And that is, you say "the first year of the proposed extension will allow the staff and other governmental agencies, and interested parties, to finish ongoing studies aimed at providing a more complete and sound scientific basis for the recent decision than was available at the end of 1974."

Now, could you explain the choice of the year 1974? Would you tell me why you chose 1974 for this statement?

(Pause.)

A (Witness Van Winkle). With minor exceptions, the NYU entrainment data being such an exception, for 1973, the staff -- well, and also the 1974 round of icthyoplankton data for the river. At the end of 1974, that was approximately the date for the Indian Point 3 FES.

Q That's correct.

Now, it's true, is it not, Dr. Van Winkle, though, the Indian Point 3 Final Environmental Statement was published in February 1975, and the data that were used in the analysis were 1973 data.

A Well, what the sentence says here, that the data -- what it's talking about is the data base and analysis base available at the end of 1974, which did not include the 1974 data.

Q Right. So you were simply referring to a chronological period?

A That's right.

Q Rather than to a data base that was available that reflected the time. In other words, you were using 1973 data instead of 1974 data?

A That is right, because the '74 data were not available to us at that time.

Q Yes, I understand. I see what you're getting at.

Now, let me refer you to another sentence in here, and ask you whether you wrote it. I'm referring to the statement on page 7-12, the last sentenceon the page. "It is the staff's opinion that the probability of showing that a closed-cycle cooling system will not be required is so low that there is little risk that the expenditure of funds for construction of the tower will be unnecessary."

Did you write that sentence, sir, Dr. Van Winkle?

A No, I did not.

Q Dr. Geckler, is that your conclusion?

A (Witness Geckler). Yes, sir.

Q Now, Dr. Geckler, do you think that there is some final possibility that some or all of the studies that were described in the draft staff document could lead you to decide that closed-cycle cooling is not required for the Indian Point 2 plant?

A I would not be competent to review in detail most of the information.

Q Well, if you're not competent to review in detail most of the information, do you nevertheless consider yourself competent to render the opinion at the bottom of page 7-12?

A Yes.

(Pause.)

Q Dr. Van Winkle, do you have an opinion with regard to the conclusion that is drawn in the last sentence on that page?

CHAIRMAN JENSCH: To whom is this addressed?

MR. TROSTEN: Dr. Van Winkle. I ask it of Dr. Van Winkle, sir, because Dr. Geckler has stated that he does not have the professional competence to judge the value of the data in these original studies, whereas Dr. Van Winkle does. And so, I thought I should ask the question of Dr. Van Winkle.

CHAIRMAN JENSCH: Well, is that entirely aquatic biologist opinion, or does this involve some Commission action, invading the province of the Commission?

MR. TROSTEN: Well, I have to find some witness here whom I can cross examine on this, Mr. Chairman.

CHAIRMAN JENSCH: What about Commission Chairman Marcus E. --

MR. TROSTEN: Well, he's not here, and I can't subpoena him.

CHAIRMAN JENSCH: Well, anyway, these fellows can't tell.

WITNESS GECKLER: I would be happy to verify the writing that I did on this particular sentence. Taking the information that was available to me, that is, the technical information as I understand it from reading what I have read, and for the reasons based on that, it was my opinion, as a manager, if you will, that that information -- that would lead me, as a manager, to conclude that there was a low probability of risk.

BY MR. TROSTEN:

Q Now, Dr. Geckler, if you received a recommendation from the Environmental Protection Agency that our application to eliminate the requirements for closed-cycle cooling should be denied, are there any data that would have caused you to change your position?

MR. LEWIS: If the EPA --

MR. TROSTEN: Let me rephrase my question.

BY MR. TROSTEN:

Q Let's assume that we submit our application to you, and it contains a great deal of data. Now, let's assume that after the application is received, you receive another letter from the Environmental Protection Agency that says our application should be denied.

Now, is there any amount of data that we could submit that would cause you to conclude, in the face of that recommendation of the Environmental Protection Agency, that

you should nevertheless recommend the granting of our application?

MR. SHEMIN: Objection. That question -- actually, almost the same question was asked and answered; if he felt that he had to decide the same way that the Environmental Protection Agency recommended, in another question. And now he's saying, is there any amount of data that could get you to decide otherwise than what the Environmental Protection Agency recommended. To me, that's the same question.

MR. TROSTEN: Mr. Shemin, do you want to become staff counsel?

MR. SHEMIN: I'm trying to get this thing moved along and get the irrelevancies out. I feel that it's --

CHAIRMAN JENSCH: You object to the question. I think it raises the question of the premise, so that if we send in an awful lot of data, and somebody else said, we don't think you should grant it, what additional data do you need to find out what the data that you submitted was?

I just think you have so much speculative conjectures compounded one on another that it's not a fair question.

MR. TROSTEN: Well, the problem that I have is this.

CHAIRMAN JENSCH: The objection is sustained.

MR. TROSTEN: Let me try to rephrase it, Mr. Chairman. I'm really troubled by this, because the staff has not performed the benefit/cost analysis here. They've performed

what is called the benefit/cost balance. Now, the fundamental element in the benefit/cost balance is the staff's opinion, which is unsupported, that the probability -- the expenditure of funds for the cooling tower will be shown to be unnecessary is so low that this is not a significant benefit. I need to explore the basis for that opinion.

CHAIRMAN JENSCH: That's a different question.

MR. TROSTEN: Yes, all right.

BY MR. TROSTEN:

Q Let's try again.

Can you identify, Dr. Van Winkle, the type of information that would increase the probability that you would believe that the expenditure of funds would be unnecessary?

MR. LEWIS: I'm going to object to this. I really think that's reversing the tables in an impermissible way. I don't think it falls on Dr. Geckler to articulate to you what the type of data is that might constitute a showing.

MR. TROSTEN: Wall, Mr. Lewis, let me rephrase it.

CHAIRMAN JENSCH: I think what the counsel is stating; you can ask the gentleman what are the factors that led to his conclusion, but not what factors might change his conclusion, because he doesn't know how many different variables might be involved. But I think you're entitled to find out what the factors that he considered in arriving at his conclusion are.

MR. TROSTEN: All right, sir.

BY MR. TROSTEN:

Q Well, let me ask you this. Would you accept the premise that your mind could be changed, that your conclusion could be changed? Or do you feel that there's nothing that could be considered that would cause you to change?

A (WItness Geckler). The latter part of your question, I would say -- I'm sorry; strike it or whatever.

My recognition of the low probability here is also a recognition that it could change, given sufficient information, which I can't specify.

Q YOu say you cannot specify what information would cause you to change your mind?

A Not in detail.

Q All right.

Can you tell me what caused you to believe that the probability was so low that the expenditure of funds for construction will be unnecessary?

A The things that I have learned through prior proceedings, and the review of the environmental statements, are the main sources of my opinion.

LAST TAKE RB:jrbl 5:15pm fls Dave

Q Let me rephrase my question slightly: Could you state what is the basis for your opinion that there is such a low probability?

MR. LEWIS: I object. I believe that that is what he just answered.

CHAIRMAN JENSCH: There's a different form to the question.

Let's see if you can approach it differently. Would you repeat it, please?

MR. TROSTEN: Yes.

BY MR. TROSTEN:

Q What is the basis for your opinion that there is such a low probability that there is little risk that the expenditure of funds for construction of the tower will be unnecessary?

A (Dr. Geckler) The sources of information I just quoted indicate that the impact over the long term would be unacceptable; plus, the various rulings in Indian Point 2 and 3, which seem to indicate, or indicate to me, at any rate, that closed-cycle cooling will be required, or is required.

Q Have you completed your answer?

A Yes.

Q Now, were you the Project Manager in the Indian Point 3 Final Environmental Statement?

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A No, sir.

Q So you have simply read the document, and have drawn the conclusion that you mentioned?

MR. LEWIS: Objection. Simply read the document?

BY MR. TROSTEN:

Q Excuse me.

What is the basis upon which you formed this conclusion on the Indian Point 3 proceeding?

A (Dr. Geckler) Study and reading of the documents, and discussions with the previous Project Manager.

(Pause.)

Q Dr. Van Winkle, I have several other questions for you; referring to page 7-9, you state in the last full paragraph on that page under "Responses to Comments by the West Branch Conservation Association", you state, "Of course, what is lacking for each" -- sorry, next to the last sentence:

"Or course, what is lacking for each year except 1973 and 1974 are river-wide estimates of total standing crop of post yolk-sac larvae."

And you go on to say, "Without this information, it is not possible to estimate survival from post yolk-sac larvae to juveniles in August, which is really the issue at stake here."

Now, there will be, of course, an additional

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estimate of this for the year 1975; is that correct?

A (Dr. Van Winkle) Yes.

Q And so the 1975 data will therefore represent one of only three estimates of this survival of post yolk-sac larvae to juveniles in August, which you characterize as "really the issue at stake here".

Is that right?

A If we could back up to the information that has been deleted?

Q Yes?

A You know, having the information for 1975, which, in fact, is in response to Mr. Brigg's request, we have already received it.

Q Yes?

A We still are not in a position to estimate the survival.

Q I see.

So the changes that you made sort of changed the effect of that?

A Yes, it did.

MR. BRIGGS: Mr. Trosten, I would just like to make a remark here:

I hope that in the information that is put in in January that there will be estimates of the total standing crop, rather than just the peak standing crop.

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MR. TROSTEN: Yes.

CHAIRMAN JENSCH: I don't think that got in the record; are you saying it will be?

MR. TROSTEN: I don't know. I would have to consult.

MR. BRIGGS: It's not important to put those on today; it is just a hope it will be in the report.

MR. TROSTEN: Let me discuss this with the consultants.

BY MR. TROSTEN:

Q Dr. Van Winkle, I have several questions I would like to ask you, again, dealing with the subject of improvements in biological evaluation; and they deal with the language that you use concerning the quantum jump, the necessity for proving the biological evaluation.

But I am not talking now just about the spatial and temporal abundance, but other data as well.

Now, I ask you this: is it a possibility that you might conclude as a result of the analysis of an additional year's data, and previous data, that the plant-induced mortality was not 100 percent, as assumed by the Staff in the Indian Point 2 hearing, but is actually, essentially, the value as shown in Table E-1 of Con Edison's testimony that appears on page 33?

A (Dr. Van Winkle) Although I understand, although

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I do not fully appreciate your reference to separate -- that this is an Indian Point 2 hearing?

Q Yes?

A The Staff has already reevaluated the f_c value at Indian Point 3 FES so that our position is not at this time that it is 100 percent.

Q Right; yes, I understand; right.

Now, my question is: is it your testimony you might conclude that the values are actually closer to the values stated in this table than were the values assumed by the Staff in the Indian Point 2 hearing, the answer is yes? -- since you have already reevaluated?

MR. SHEMIN: I object.

WITNESS VAN WINKLE: I think you are getting at a little bit more than that: you are getting at the data here in Table E-1, and all I can say is that we will certainly evaluate the NYU, or the data collected at all three of the plants, whether by net or by larval table; and we will evaluate the use of correction factors for differential net mortality, and reach an independent assessment on what the appropriate f_c value is, according to the entrainable life stages.

CHAIRMAN JENSCH: Just clearing the record on this gentleman's objection -- it is overruled; proceed.

BY MR. TROSTEN:

JRB#6

Q Now, Dr. Geckler, let us assume that the evidence which is presented to the Staff in the January 1977 report shows that the values that are portrayed in this particular table are actually the correct values -- appear to be the correct values for entrainment mortality.

Now, would this change the Staff's position with regard to the necessity of once-through cooling for closed-cycle cooling at Indian Point?

MR. LEWIS: Objection. I think this is much too sensitive an area, too grave an assumption, that the January 77 report which isn't even at issue here, will show that the figures set forth in Table E-1, which haven't been adjudicated yet either, are the correct value.

It's simply going too far out in the assumptions that have to be made; and I don't think, given the fact that the January 77 report is not in issue here, I don't think it is relevant to this determination.

CHAIRMAN JENSCH: I think this is a hypothetical question; he assumes -- assume that these are the figures, and upon that basis what would that do to the judgment of the Staff?

I think it is a hypothetical question, and it is a proper question. Objection overruled.

Do you have the question in mind, Dr. Van Winkle?

WITNESS GECKLER: Yes.

jrb7

I don't know.

BY MR. TROSTEN:

Q You don't know whether it would change the Staff's position?

A (Dr. Geckler.) Yes.

Q Dr. Van Winkle, is it possible that through analysis of the data gathered during 1975 and prior year's data that you might conclude that the Staff's assumption in the Indian Point 2 hearings, the Hudson contributed 80 percent of the striped bass fishery was wrong, and that in fact the Hudson contributed only 7 percent to the Coastal fishery?

I refer here to page 63 of our testimony.

MR. LEWIS: Page 63 of your testimony? Let me look at that for a second.

CHAIRMAN JENSCH: While he is doing that, the Licensee's counsel, can you indicate when you think it would be a convenient time to interrupt your cross-examination; somebody is riding herd on us on the reporters because we are trying to accommodate their schedule. They lost a lot of time by our having had the sessions over at Elmsford; they weren't able to do the typing.

And wherever you find a convenient place to stop?

MR. TROSTEN: All right, sir.

jrb8

MR. LEWIS: Mr. Chairman, my problem with the question is that counsel for Licensee, I am certain is aware as is the Board, that I believe the figure you talked about, the 80 percent contribution of the Hudson to the Atlantic fishery?

MR. TROSTEN: Yes, sir.

MR. LEWIS: Was in fact a much earlier position of the Staff, and I believe that the record of the Indian Point 3 proceeding will amply indicate the fact that that is no longer the position of Staff.

I suppose I can understand Mr. Trosten trying to develop the record, and if you are trying to develop the record that that is in fact not the position of Staff any more?

MR. TROSTEN: There's a very fundamental problem that is underneath the surface in these hearings, Mr. Chairman -- this exchange between Staff counsel and myself and Staff's witnesses brings it out. And that is that Staff really is not operating on the basis of the record in the Indian Point 2 proceeding; it is really treating the Indian Point -- it's position in the Indian Point 3 Final Environmental Statement.

Now, we have discussed, and I don't want to burden the record any more with it -- the argument between Staff counsel and myself as to the significance of that document

rb9

in this proceeding. The Staff is really saying, well, when we presented our application here, they pulled out the Indian Point 3 Final Environmental Statement and said, oh, why we looked at that problem before; and they did not really do an analysis. They just kind of read through the Indian Point 3 FES, and said, what's new?

Well, that is not really what they should have done. They really were dealing with an Indian Point 2 record.

I also think there is another very significant point here, because it shows that the changes in the Staff position, and the continuing evolution of the Staff position from the earlier grossly conservative estimates shows how important it is that you get data so that you can decide whether these grossly conservative assumptions are real.

And that's what we are trying to do here. We are trying to get more time so that this Board will have the data before it on which to make this decision. That is the reason.

CHAIRMAN JENSCH: I understand your last question is similar to your previous one? It's a hypothetical, assuming the contribution is 7 percent and not 80 percent; would that affect the judgment of the Staff?

MR. TROSTEN: Yes.

CHAIRMAN JENSCH: It's a hypothetical question and

jrb10

is proper. Overruled.

MR. TROSTEN: Do you have the question clear in your mind, Dr. Geckler? I'll just state it very quickly.

BY MR. TROSTEN:

Q Is it a possibility that your analysis of data gathered in 1975 and prior years' data, you might then conclude that the Staff's assumptions in the Indian Point 2 hearing that the Hudson contributed 80 percent to the Atlantic striped bass fishery was wrong; and that in fact the Hudson contributed only 7 percent of the coastal fishery?

Now, if you actually concluded that, if that possibility came to pass, would that change the Staff's position on whether or not once-through cooling should be required for Indian Point.

MR. BRIGGS: Do you want to ask whether once-through cooling should be required, or whether they should receive an extension?

MR. TROSTEN: I beg your pardon. No, no, sir; whether closed-cycle cooling should be required for Indian Point. I misstated that. I apologize to the Board for it.

MR. SHEMIN: May I pose an objection? I wish to make clear the 80 percent refers to the Mid-Atlantic, and the 7 percent I assume refers to a larger fishery than the Mid- Atlantic fishers; and they are not the same fishery

jrb11

being referred to in the two documents.

MR. TROSTEN: I was speaking in shorthand terms, sir. The record will speak for itself.

CHAIRMAN JENSCH: That's an important distinction he is raising. I had assumed your last statement wasn't quite the hypothetical you had earlier propounded. I am having a little more difficulty with the second question.

But with this distinction the Attorney General is pointing out, I think it's of great importance to point out the difference of areas involved.

Can you eliminate the shorthand and restate your question precisely, delineating the areas?

MR. TROSTEN: Yes. I will restate the question. The problem is to try to make the refinements Mr. Shemin is stating, you get into a lot of confusion, because the Middle Atlantic fishery is defined in Indian Point 2 hearings one way, and then we have a new term, the coastal fishery, with the inner zone and outer zone. I am just trying to state it in a general way.

I will try, Mr. Chairman.

BY MR. TROSTEN:

Q My point is simply this: let me change the question, Dr. Geckler.

Supposing you were to conclude after evaluating the January 1977 report that the contribution of the Hudson

jrb12

to the Atlantic striped bass fishery, that is, the coastal fishery, as described in the December 7, 1976 testimony that has been submitted in this proceeding were correct; that that is actually the contribution of the Hudson to the Atlantic coastal fishery?

Now, would that change the Staff's position on whether closed cycle cooling should be required for Indian Point?

A (Dr. Geckler) I don't know whether it would change the Staff's position; it would certainly influence their thinking.

Q Now, I just have one more question, I guess, along these lines; and that is:

Is it possible that through an analysis of the data gathered during 1975 and prior years' data that you would conclude that compensatory reserve exists within the striped bass population sufficient to offset substantially or entirely estimated impact of power plant operations?

A You will have to repeat that, please?

Q Is it possible that through an analysis of the data gathered during 1975 and prior years' data you would conclude that a compensatory reserve exists within the striped bass population sufficient to offset substantially or entirely the estimated impact of power plant operation?

MR. LEWIS: You will accept an answer from either

jrb13

member of the panel on this one?

MR. TROSTEN: I understand Mr. Geckler was responsible for that statement about how low the probability was that the cooling tower expenditures and so forth.

WITNESS GECKLER: It would depend for the evaluation of the value of compensatory factors on the Oak Ridge National Laboratory; given thatinformation it would be included with all the other information available, and, again, it would influence our thinking, I am quite sure.

I cannot say definitely whether it would change our position or not.

CHAIRMAN JENSCH: Is this a convenient place?

MR. TROSTEN: One more question, Mr. Chairman; and that will be it.

BY MR. TROSTEN:

Q Dr. Geckler, would you say that in evaluating the benefit that the probability that these construction expenditures would be shown to be unnecessary -- let me rephrase it; it's getting late, Mr. Chairman.

Would you say, Dr. Geckler, that the Staff's opinion that is stated on the bottom of page 7-12 about the probability that the expenditure of funds for construction of the tower would be unnecessary, is of any particular value to this Board in deciding what that probability is?

jrb14

MR. LEWIS: Objection.

CHAIRMAN JENSCH: If you know what this Board is thinking, at least tell us; because I don't think we are in a position to indicate our position. So if you can guess what we should be thinking -- is that what your question is?

MR. TROSTEN: I withdraw that question.

CHAIRMAN JENSCH: Is there anything we can take up?

MR.SACK: Yes, I understand there was some question this morning about the distribution of a document. I think I have the answer, if Ms. Chasis would care to clarify exactly what she asked.

CHAIRMAN JENSCH: We'll take it up first thing in the morning, and maybe she can clarify it then.

All right, at this time let us recess to reconvene in this room tomorrow morning at 9 o'clock.

(Whereupon, at 6:41 p.m., Thursday, 9 December 1976, the hearing was adjourned, to reconvene at 9 a.m., Friday, 10 December 1976.)