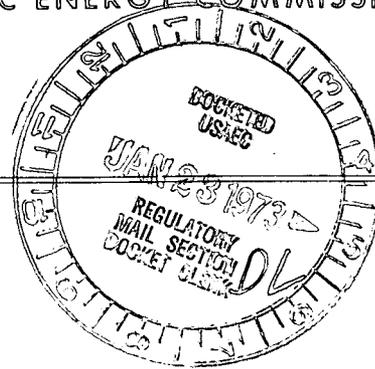


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UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

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 In the Matter of: :
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 CONSOLIDATED EDISON COMPANY OF : Docket No. 50-247
 NEW YORK, INC. :
 :
 (INDIAN POINT STATION, UNIT NO. 2) :
 :
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Room 532
Sixth and Pennsylvania Avenue, N. W.
Washington, D. C.

Friday, 19 January 1973

The above-entitled matter came on for further
hearing, pursuant to adjournment, at 9:30 a.m

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

DR. JOHN C. GEYER, Member.

MR. R. B. BRIGGS, Member.

APPEARANCES:

(As heretofore noted.)

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cr 154 1-19

P R O C E E D I N G S

2 CHAIRMAN JENSCH: Please come to order.

3 Whereupon,

4 PHILIP GOODYEAR

5 resumed the stand as a witness on behalf of the Regulatory
6 Staff, and having been previously duly sworn, was examined
7 and testified further as follows:

8 MR. TROSTEN: Mr. Chairman, we are prepared to under-
9 take a brief additional interrogation by Dr. Lawler, which we
10 indicated we would last night, based upon the discussions
11 that took place last evening.

12 CHAIRMAN JENSCH: Are you ready to proceed with
13 further examination?

14 MR. TROSTEN: That is right.

15 CHAIRMAN JENSCH: What is the agenda in reference
16 to Hudson River Fishermen's Association?

17 MR. MACBETH: My understanding from Mr. Trosten
18 last night was, he didn't think his cross-examination would
19 go more than 15 or 20 minutes, and then I would pick up,
20 then.

21 CHAIRMAN JENSCH: Very well.

22 If Staff counsel would ask one of his able
23 assistants to contact someone to see if we can get microphones
24 connected today, we would appreciate it.

Without the microphones, Dr. Lawler, can you proceed?

mm2

1 DR. LAWLER: Yes, Mr. Chairman.

2 There are two short lines of inquiry this morning.

3 The first is to summarize the line of inquiry of

4 yesterday afternoon, to make sure that we understand or are

5 on the same wavelength as Dr. Goodyear, with respect to his

6 model.

7 The second is some questions on the verification

8 of his model.

9 CROSS-EXAMINATION (Continued.)

10 BY DR. LAWLER:

XXX

11 Q Dr. Goodyear, you have stated in the paragraph

12 entitled "Estimate of Entrainment," on page ^{A-5-81}~~A-581~~, in the

13 last sentence after commenting on the comparison with the

14 field data, that the "most obvious result of these

15 comparisons was that the longitudinal distribution was more

16 sensitive to variations in assumed magnitudes of the density-

17 induced flows than were the estimates of entrainments."

18 Now I ask you, are you saying that regardless of

19 the conditions modeled, the entrainment loss is still

20 essentially the same?

21 A. Within a factor of two, yes.

22 Q. Within a factor of two?

23 A. Yes.

24 Q. Thank you.

25 Dr. Goodyear, is it not true that your model

mm3 1 continually brings larvae back from a point below the plant
2 into a position above the plant?

3 A. Yes.

4 Q. And do these larvae not then pass the plant a
5 number of times before the end of the eight-week period of
6 vulnerability?

7 A. Yes.

8 Q. You have then an endless belt in which organisms
9 are constantly flowing past the plant, dropping into the
10 lower layer, and then returning and repassing the plant,
11 would you not agree?

12 A. Yes.

13 Q. Dr. Goodyear, will not the changing of conditions
14 of flow and/or migration factors speed up or slow down the
15 rate at which this rotating or circulating belt functions?

16 A. Yes.

17 Q. Dr. Goodyear, is not the insensitivity of your
18 estimate of entrainment to variation in the input parameters
19 due to this endless belt concept?

20 A. Yes.

21 Q. In other words, as long as you keep Indian Point
22 located within the belt, you will get approximately the same
23 results regardless of input changes?

24 A. Yes.

25 Q. The range in results will be related to how fast a

mm4

1 given set of input parameters makes the belt circulate,
2 would you not agree?

3 A. Yes.

4 Q. Thank you, Dr. Goodyear.

5 This next line of inquiry, I should have mentioned,
6 is a short comparison to the things that the model presented
7 by yourself and the model presented by the Applicant, appear to
8 have in common.

9 Dr. Goodyear, are you familiar with the notion of
10 "F" factors introduced in the Applicant's model in its October
11 30 testimony?

12 A. Yes.

13 Q. And are you familiar with the fact that these were
14 introduced to account for susceptibility of organisms in the
15 Indian Point area to entrainment and for mortality across the
16 plant circulating water system?

17 A. Yes.

18 Q. Have you not also introduced into your model,
19 factors of a similar nature?

20 A. Yes.

21 Q. Are these not the coefficients m_r which appear in
22 the derivation of the equation on page ^{A-5-82} A-582?

23 A. Yes.

24 Q. The plant intake is essentially located in the
25 upper layer.

mm5

1 Have you considered withdrawal of plant flow from
2 the upper layer only?

3 A. In what respect?

4 Q Well, what I am asking you is in your computational
5 procedure employed to calculate the effect of the plant on the
6 organisms in the Indian Point vicinity, you have a term which
7 involves the plant flow and the concentration of the organisms
8 in the vicinity.

9 I am asking you, have you considered using the
10 concentration in the upper layer as the concentration
11 exposed to entrainment by the plant?

12 A. The concentration?

13 Q Yes, sir.

14 A. No.

15 The reason for that, I might point out, is that the
16 data which were evaluated from Carlson-McCann, 1968 data, which
17 represents the most extensive sampling that has been done for
18 vertical distribution -- this is presented in summarized form
19 in Table A-513 -- when averaged over the vertical water column,
20 the definition which can be attributed to lateral location is
21 not significant.

22 In other words, while the fish are moving from the
23 surface to the bottom, they actually show a concentration
24 gradient, and the concentration gradient at any point, from
one side of the river to the other, is determined by the

mm6 1 depth of the water, rather than by the surface and lower layers,
2 themselves, from a hydraulic standpoint.

3 Q Dr. Goodyear, you stated a moment ago that the most
4 extensive data on, I think you said larval diurnal migration,
5 appeared in Carlson-McCann and you have reproduced that in
6 Table ^{A-5-13}~~A-513~~, is that correct?

7 A What I said was the most extensive data showing
8 vertical distribution by lateral location, or what I meant to
9 say was that.

10 This data is summarized in A-513.

11 Q Dr. Goodyear, are you familiar with the data on
12 larval vertical distribution as reported by the NYU people?

13 A Yes.

14 Q And was not that data reported in the Indian Point
15 vicinity?

16 A Yes.

17 Q Have you evaluated that data in the same fashion
18 as you have evaluated the Cornwall, the data of Carlson-
19 McCann at Cornwall that appears in Table A-513?

20 A The same procedures were applied.

21 However, there is a problem there in that the
22 sampling did not represent enough points in the water column
23 to get a mean for the water column.

24 In other words, a shallow sampling station with a
25 bottom, and a surface sample -- the difference really is in the

mm7

1 number of samples that were taken at each depth.

2 These were taken by the Carlson-McCann study repre-
3 senting one sample at each 15-foot interval, and the concentra-
4 tion averaged in a 50-foot depth, over 50-foot depth, was the
5 same concentration as that averaged over a 10-foot depth.

6 The reason that that is important, is the water
7 that is actually being withdrawn is withdrawn from surface
8 to bottom, it is not being withdrawn from the surface zone
9 itself. It is in the upper layer, or most of it would be;
10 some of it would be more towards the middle zone, which is not
11 being transported very fast.

12 However, the fact that it is taken from surface to
13 bottom would indicate from Carlson-McCann data that the concen-
14 tration itself would not be likely to deviate, or the
15 average concentration withdrawn would not be likely to deviate
16 from the average throughout the river at that point.

17 Q. Are you saying that it is your opinion that the water
18 at Indian Point is being taken from surface to bottom?

19 A. Yes.

20 MR. LYLE: Excuse me.

21 Would the witness try the microphone now, please?

22 BY MR. LAWLER:

23 Q. Do you have any opinion on the relative proportions
24 of the water that is being taken at Indian Point from various
25 depths in the water column?

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1 A. Not an adequate description, no.

2 As I said before, the surface layer is the layer
3 that is primarily being utilized. But from a local standpoint
4 this is the same point I tried to get to yesterday, from
5 the local standpoint, the water that is withdrawn, is with-
6 drawn from surface to bottom. The bottom of the intake, for
7 instance, is on the bottom of the river.

8 Q. Dr. Goodyear, when you say the bottom of the intake
9 is on the bottom of the river, are you not referring to the
10 fact that the intake structure is a shoreline structure?

11 A. Yes.

12 Q. Do you know the relation of the bottom of the river,
13 let's say a distance 200 feet to the west of the intake
14 structure?

15 A. Yes.

16 Q. Is that not deeper than the bottom of the intake
17 structure?

18 A. Considerably.

19 Q. Thank you.

20 CHAIRMAN JENSCH: While you are on that subject, do
21 you have any, if I use the term correctly, water dynamics
22 study?

23 I have been interested in this phase of the flow
24 of the water when the pumps are on. I had the impression that
25 the Applicants had a kind of selected tag at the top, and I

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1 didn't understand there was a physical possibility that there
2 was any limitation when you put your intake in an area that
3 all that might move would move.

4 I think that is the proper term.

5 Have there been any studies made in that regard by
6 some sort of meters or flow checks of any kind?

7 DR. LAWLER: A few things have been done,
8 Mr. Jensch.

9 There have been some velocity profiles made right
10 in the plant intake itself, not in the river, but in the intake
11 itself. And we are beginning to get some idea of the
12 distribuiton of the velocities in the intake structure.

13 These velocities will change and the distribution
14 will change as the screens become dirtier, or more and more
15 clogged.

16 CHAIRMAN JENSCH: It is really outside of the
17 screens, is what I had in mind.

18 DR. LAWLER: Outside of the screens, I am not aware
19 of physical measurements of velocity that have been made to
20 date. There have been some flow net analyses made, which
21 is a technique that is used to try to, under where the
22 water being withdrawn by a particular sink of water, let's say,
23 such as the plant, would be coming from. But those flow
24 net studies are not complete at this point.

25 CHAIRMAN JENSCH: It seems to me that that is a very

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1 important part of this proceeding, to see how the water
2 flows outside of the screens, because we can argue that, well,
3 we think it comes from the surface, but how can we think it
4 comes from the bottom of the river when we think it comes
5 from the top.

6 That is about the way the record looks at the
7 moment.

8 Will you proceed.

9 DR. LAWLER: Thank you. That completes this line of
10 thought.

11 The only thing I have left is a few questions on
12 the verification of the model.

13 CHAIRMAN JENSCH: One further item, and perhaps this
14 is not directed to Dr. Goodyear, but you mentioned a little
15 earlier "F" factors.

16 Maybe this is something you might consider for
17 rebuttal from Dr. Lawler, but if the "F" factors utilized by
18 the Applicant, if the "F" factor is less than one, as I
19 understand it, then the other "F" factors should be above one,
20 should they not?

21 DR. LAWLER: No, sir, there is no reason for that
22 at all.

23 CHAIRMAN JENSCH: I thought the "F" factor was an
24 average.

25 DR. LAWLER: Mr. Jensch, the "F" factors, there are

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1 four "F" factors and they simply relate to the fact that out
2 in the river, as far as the model of the Applicant is concerned,
3 the predictions of the concentration of organisms out in the
4 river is what we call an area average prediction.

5 It is the average concentration of organisms across
6 the river section.

7 And the "F" factors have been introduced to recog-
8 nize that the concentration in front of the plant may be larger,
9 and in that case an "F" factor could exceed one, or may be
10 smaller, and in that case, an "F" factor would be less than one.

11 This is the so-called "Fs" of one and "Fs" of two
12 factors.

13 I would say the "Fs" of three factors, which relates
14 to the fact that the plant is drawing organisms down and to
15 resupport or provide a continual support of organisms to the
16 plant, you would have to get more in there, I would say that
17 that can't exceed one.

18 And the F_c factor is simply the mortality across
19 the plant or survival, I guess it is the survival across
20 the plant circulating water system.

21 In any event, that would never exceed one. It would
22 vary from zero to one.

23 If the F_c , I am certain, was defined in terms of
24 survival, so if you had 100 percent mortality across the plant,
25 that "F" factor would be -- no, I am wrong. The F_c factor

mm12 1 is identical to the mortality across the plant.

2 So as the mortality across the plant decreases,
3 that is to say is less than 100 percent, the F_c factor would
4 be less than one. But in any event, it could not be less than
5 zero, because zero would mean there would be no mortality.

6 MR. BRIGGS: Are you saying three of them can
7 exceed one?

8 DR. LAWLER: No, only two have a possibility. The
9 factor could exceed one if the concentration in the upper
10 quadrant exceeds the average concentration. And if the two
11 can exceed one, if what the plants actually says in its
12 intake exceeds the concentration in the so-called upper reach.
13 But the other two couldn't exceed one. They would have a maxi-
14 mum value of one.

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1 CHAIRMAN JENSCH: I don't know whether it is
2 worthwhile to give further consideration to this matter
3 in your rebuttal, what would be the effect if the two "F"
4 factors did exceed one, how that would affect the model.

5 DR. LAWLER: We could comment on that, Mr. Jensch.

6 CHAIRMAN JENSCH: Fine.

7 Will you proceed, please?

8 BY DR. LAWLER:

9 Q Dr. Goodyear, on page v-53 you have presented
10 a series of observed field observations of larval distribution
11 or longitudinal larval distribution in the river, and also
12 the results from several selected model runs. So the verifi-
13 cation in terms of a comparison of the model results, the
14 field observations, then, appears to be given on page v-53.

15 My question to you is are you not simply showing
16 that the shape of the longitudinal distribution of larvae
17 as generated by the model is similar to the shape of the
18 distribution as observed in the field?

19 A Yes.

20 Q And the time rpresented by the runs depicted in
21 figure v-11, that is to say the model runs, is four weeks.
22 Is that not correct?

23 A That is correct.

24 Q And the time represented by the field runs in figures
25 v-11 covers several periods after spawning. Is that not correct?

1 A That is correct.

2 Q And the time represented by the field runs in
3 figure v-11 covers several periods after spawning. Is that
4 not correct?

5 A Yes.

6 Q Now the model receives all of the spawn at one
7 point in time; is that correct?

8 A Yes.

9 Q The spawn in the field occurs over a period of
10 several weeks; is that correct?

11 A Yes.

12 Q The magnitude of the larval concentrations from
13 the model has not been compared to the magnitude of the
14 larval concentrations in the field. Is that not correct?

15 A From an absolute sense?

16 Q The magnitude.

17 A That is true.

18 Q Thank you. That is all I have.

19 MR. BRIGGS: I have just one question.

20 If the magnitude of the concentration as predicted
21 by the model is about the same as the magnitude of the
22 concentration as it was measured, does it make any difference
23 whether the larvae recirculate or don't recirculate in the final
24 result that you get?

THE WITNESS: As long as the magnitude is similar?

1 MR. BRIGGS: If the magnitude of the computed
2 concentration is the same as the magnitude of the measured
3 concentrations from the data that one has, does it matter
4 whether the larvae recirculate as was discussed, or does it
5 not matter?

6 THE WITNESS: It matters to some degree. As I
7 pointed out, up to a factor of two in some cases. That simply
8 is the result of the fact that there is a drawdown in the
9 concentration within the compartment that the plant is located.
10 The faster the recirculation, the higher the concentration will
11 remain in that compartment.

12 MR. BRIGGS: So where drawdown is taken into
13 account, it does make a difference.

14 THE WITNESS: It does make a difference.

15 DR. LAWLER: May I ask one more question?

16 BY MR. LAWLER:

17 Q With respect to the magnitudes of the larval
18 concentrations in the model runs, are these not relative
19 magnitudes?

20 A Yes.

21 Q It is my understanding there is no attempt to
22 make those magnitudes comparable to the field observed
23 absolute numerical values. Is that not correct?

24 A That is true, but when you remember that the field
25 values are also relative numbers.

1 Q Yes, I realize that.

2 A Well, it makes it an almost meaningless comparison
3 to try to make the values identical. It can be done by
4 selecting mortality rates which will provide a numerical
5 comparison. That has been done, but the mortality rates
6 are not based on any functional relationship that can be
7 identified and modeled as such.

8 MR. BRIGGS: I guess the problem becomes one then
9 of trying to decide whether the recirculation is really
10 important. The mere fact that the larvae are carried by the
11 plant several times seems to me doesn't have to be important,
12 it depends entirely on the effects of concentration of
13 larvae in the vicinity of the plant.

14 Is that wrong?

15 DR. LAWLER: It is my understanding at this point,
16 my understanding I suppose is that the, whether the circulation
17 exists and whether it exists to the degree as stated, that is
18 that it constantly and continuously circulates back past the
19 plant seems to me is quite important.

20 Now I think that is --

21 MR. BRIGGS: I can understand one being concerned
22 about it, and that it might be important. But as I say, the
23 important thing really, it seems to me, is what the concentration
24 is where the larvae are being withdrawn from the river and
25 I don't say that one should be unconcerned about how he gets

ty 5

1 that concentration, but it is the concentration itself that
2 is important, and not really the manner in which it is obtain.

3 DR. LAWLER: You are saying the concentration is
4 important by comparison to the concentration at other points
5 in the river?

6 MR. BRIGGS: Well, it shows here, as I read these
7 cruves, that the model seems to give you the same, about the
8 right shape of distribution curve.

9 As you pointed out, you don't know what the
10 concentration is. And so if the distribution curve that
11 one gets is about right, then the concentration becomes
12 important. Is that right?

13 DR. LAWLER: I am not so sure that it is. It would
14 seem to me that the distribution is particularly important,
15 because the plant, regardless of the levels of concentration,
16 the percentage of influence of the plant on that will be
17 more a function of the distribution and the circulation than it
18 will be of the magnitude of the concentration.

19 MR. BRIGGS: I agree the distribution is important.
20 I thought that was implicit in my suggesting that as I look
21 at the curves, and as I understood the testimony, the observed
22 distribution is about the same as the calculated distribution,
23 they resemble one another rather closely. And that was
24 the method of validating the, or a method of validating the
model. Is that right?

1 THE WITNESS: In essence, yes.

2 MR. BRIGGS: But the fact that you get the same
3 kind of distribution with time doesn't mean that the
4 concentrations are the same.

5 DR. LAWLER: Oh, I see your point.

6 MR. BRIGGS: Put it this way: The Board could use
7 some help on this problem. You have indicated your concern
8 about the recirculation, and I understand it, but it is not
9 obvious to me that the recirculation does turn out to be
10 extremely important, if that is just a facet of the model, and
11 one gets the proper concentrations and the proper distributions.

12 DR. LAWLER: I think I understood your last
13 comment on concentration just before you said let's put it
14 this way, the Board could use some hlep on this point.

15 Could I ask the reporter to read it back?

16 MR. BRIGGS: Well, I don't know, maybe what she
17 will read back is what I said, but not what I meant.

18 DR. LAWLER: That is why I wanted to --

19 MR. BRIGGS: What I am saying is you brought up
20 the question about the redistribution, I am sorry, about the
21 recirculation. And your feeling that this could be very
22 important. And as one member of the Board, I understand
23 your problem, but I don't see that it has been shown that it is
24 important, or that is not important, it is just left there,
25 that this could be important, but we just don't know how

1 important.

2 DR. LAWLER: The reason I think it is important
3 is because -- that is why I used the expression "endless belt"
4 you constantly keep circulating this material in front of the
5 plant, so that almost regardless of what input parameters you
6 put into the model in terms of flows or migration factors, it
7 just speeds up or slows down how fast this thing runs. But
8 when it is running for an eight-week period, you eventually
9 will see a very large proportion of the organisms in question
10 passing the plant. That is why the percentage reductions go
11 so high.

12 MR. BRIGGS: I understand. I will have to think
13 about it some more.

14 Let's put it this way: I understand the concern,
15 but as I have indicated before, if the shapes of the
16 distribution curves turn out to be right, and then if the
17 concentrations turn out to be right, it may not be possible
18 for both of these to occur with this endless belt, and then
19 it is not clear to me that it makes an awful lot of difference
20 that it does include the recirculation. I guess that is a
21 problem for Dr. Goodyear and for you also.

22 DR. LAWLER: There is a very interesting point.
23 I would agree that one could get these same shapes without
24 postulating the endless belt concept. But when one does that,
25 you get a much different percentage reduction, once you

1 operate your plant. All of these shapes shown here are
2 independent of the plant operation. This is the existing case.
3 So I think I understand what your concern is.

4 CHAIRMAN JENSCH: Very well.

5 Did you have something further?

6 MR. TROSTEN: Just with respect to Mr. Briggs'
7 closing question with regard to the white perch statistics,
8 I have two minutes of questions on this point.

9 BY MR. TROSTEN:

10 Q Dr. Goodyear, in connection with Mr. Briggs'
11 question with regard to the NYU data that were used for
12 the conclusion you express on page v-61, as a scientist,
13 Dr. Goodyear, is it your view that the data that were contained
14 in the NYU fish collection seine haul studies from 1965
15 to 1969 are adequate to determine average annual abundance of
16 white perch in the Hudson in 1965 and to compare it with 1969?

17 A Is it adequate information?

18 Q Yes.

19 A No.

20 MR. TROSTEN: Mr. Briggs, you had asked for
21 information concerning the purpose of the NYU study. We are
22 going to address this matter in greater detail in our rebuttal
23 testimony. I will refer you to page 357 of the Hudson River
24 ecology study. I have a copy here which you are welcome to
25 look at if you would like to, or I can furnish you a copy

1 of it at some other time.

2 MR. BRIGGS: Thank you.

3 CHARIMAN JENSCH: Does that complete your
4 examination?

5 MR. TROSTEN: Yes, sir.

6 CHAIRMAN JENSCH: Hudson River Fishermen's
7 Association, will you proceed?

8 BY MR. MACBETH:

9 Q Dr. Goodyear, I would like to start with the
10 section of the Final Environmental Statement which begins on
11 page v-71e, entitled "Needed Information."

12 The preamble says "In order to properly evaluate
13 the biological impact of the operation of Indian Point Unit
14 Nos. 1 and 2, several questions must be answered and several
15 aspects of the biota must be monitored."

16 Then there are a list of eight points.

17 Am I right in assuming that the eight items listed
18 in that section "e" are the statement by the Staff of the
19 information which is needed to evaluate properly the
20 biological impact of the Units 1 and 2?

21 A Yes.

22 Q I would like to go over some of them in a little
23 more detail, simply because I frankly don't understand what
24 is involved in them.

The first one discusses flow characteristics of the

1 Hudson within the zone bounded by the length of the tidal
2 excursion at low and high tide in the upstream direction
3 throughout Haverstraw Bay in the seaward direction which
4 should be detailed -- I am paraphrasing this -- should be
5 detailed in both the vertical and horizontal cross sections
6 through complete tidal cycles under a variety of lunar phases
7 and a variety of freshwater inflows. When you talk about the
8 zone bounded by the length of the tidal excursion, are you
9 talking about the tidal excursion as it would be seen from the
10 Indian Point plant or are you in fact talking about the flow
11 characteristics of the Hudson from the federal dam at Troy to
12 Haverstraw Bay?

13 A No, that is not it. The intent was that at least
14 a distance equal to the distance traveled by the volume
15 present at Indian Point from low tide to high tide, from
16 low lack to high slack.

17 Q In other words, the aim here would be to examine the
18 flow characteristics of a volume of water which is in
19 front of the plant at some point, and see what happens as
20 it moves up with the tide and down with the tide?

21 A Yes.

22 Q Now what is the reason the Staff has for seeking
23 that particular piece of information?

24 A You need it to coordinate the movements of all of
25 the organisms, planktonic organisms in the area.

ty 11

1 Q Would this in some sense be related to the "F"
2 factors, in an attempt to see whether the organisms are
3 moved by the plant in some fashion other than random distri-
4 bution laterally across the river and vertically through the
5 water column?

6 A I am not sure I would say it is an "F" factor, but
7 it would be used to evaluate that type of problem.

8 Q No. 2 on page 72 begins "The magnitude of entrain-
9 ment mortality should be determined by the Applicant."

10 Now am I right in understanding by that that the
11 kinds of studies that Dr. Lawler and NYU undertook in the
12 past summer which were reported in Dr. Lawler's testimony of
13 October 30 are needed?

14 A That would be a first step. However, the information
15 that is needed from the entrainment standpoint would be
16 accurate description of the mortality, and I haven't yet
17 seen a method for really obtaining that type of information
18 simply because things which survive passage through the
19 plant from an outward standpoint, may have reduced survival
20 in the river.

21 Furthermore there are problems in getting good
22 mortality estimates that result from the sampling procedures
23 which cause some mortality in themselves.

End #2

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1 Q By that answer do you mean simply that the design
2 of the project as it has been conducted by Dr. Lauer
3 will not allow the collection of all of the information which
4 you think is necessary or do you mean that you have not seen any
5 design which would collect all of the information that you think
6 is necessary?

7 A I think both statements would be accurate.

8 Q Do you think it would be easy to design a project
9 that would collect all of the information that you want?

10 A No.

11 Q Let me back up a moment to the first one. Would it
12 be easy to design a project which would give you all of the
13 information on flow characteristics that you want?

14 CHAIRMAN JENSCH: Excuse me, I am having a little
15 difficulty with the question. Whether it is easy or hard,
16 what factors do you think should be in the design?

17 MR. MACBETH: Well, the design is described here,
18 the cross-sections through the complete tidal cycles, variety
19 of lunar phase, variety of fresh water input. Perhaps easy
20 and difficult is not a good way to characterize it. What I
21 am aiming at is is this something feasible within the next
22 year. That is really what I was aiming at with the discussion
23 on entrainments too, and I took the answer from Dr. Goodyear
24 to be that he thought it was unlikely in the immediate
25 future that a study could be designed that would provide the

1 information needed. I am really aiming the same
2 question here.

3 CHAIRMAN JENSCH: What are the factors that would
4 render it feasible or infeasible.

5 THE WITNESS: For the hydraulic portion of it,
6 I am not familiar enough with the techniques available to answer
7 your question.

8 MR. MACBETH: Does the Staff have another witness
9 it can offer on this point? Not at this time, I don't
10 want to interrupt the cross-examination, but would they have some-
11 one else later.

12 MR. KARMAN: You go ahead and I will check this out.

13 MR. MACBETH: Fine.

14 BY MR. MACBETH:

15 Q No. 3 deals with residual chlorine and No. 4 with
16 the thermal plume. Let me move to No. 5, which gets back to the
17 central issues that we have been dealing with here. No. 5
18 says, "The reproductive status, food requirements, and more
19 abundant consumers species must be determined," and then, "
20 The fish species involved would have to include those species
21 which have eggs or larval stages susceptible to withdrawal.
22 Among these would be the bay anchovie, white perch, tomcod,
23 blue-backed herring, alewife, smelt, and striped bass."

24 What do you mean by the reproductive status of those
25 fish species?

1 A ACTually everything that is involved in the
2 compensatory process, and how in this particular river the
3 reproductive activities are involved.

4 Q How long do you think it would take to design and carry
5 out an analysis of that reproductive status for the bay
6 anchovie, white perch, tomcod, blue-backed herring, alewife,
7 smelt and striped bass?

8 A Depending upon how much background information you
9 could get --

10 Q Shall we break it down and take one fish at a time.
11 Let's take bay anchovie?

12 A The same problem is true for all of them from
13 my standpoint, because I am not presently aware of the detailed
14 background knowledge which may exist for all of those species.
15 Starting from scratch, I think it could be done in about
16 ten years. But for each one, where one didn't have to start from
17 scratch, you could reduce the time to some degree.

18 Q Which of the ones in that list would you
19 think you would not have to start from scratch on?

20 A The striped bass and the smelt, probably also the
21 alewife.

22 Q TAKing each of those in turn, how long do you think
23 it would take to design and conduct studies suggested here.

24 A Again, that is dependent on how much effort went
25 into the study and how well it was designed to begin with. But

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1 several years to characterize the river itself, I am sure.

2 There may be the data available for some of these fish already.

3 MR. TROSTEN: Dr. Goodyear, is it correct that you
4 are addressing yourself to the last named species, those three,
5 when you answered the question -- what were the three again
6 please?

7 MR. MACBETH: The alewife, smelt and striped bass.

8 MR. TROSTEN: I am correct that you were addressing
9 your last response to those three species?

10 THE WITNESS: Yes.

11 MR. TROSTEN: Thank you.

12 BY MR. MACBETH:

13 Q Would you describe the status of knowledge about
14 the striped bass in terms that relate to the confidence which
15 you have in the predictions that have been made as to the
16 plant's effect?

17 MR. KARMAN: Do you understand that question?

18 MR. WITNESS: Not exactly, no.

19 BY MR. MACBETH:

20 Q Well, let me describe my problem. You indicate
21 here that the reproductive status and food requirements
22 of the striped bass must be determined. In your last answer
23 you gave some indication that that might take several years
24 to do. What I am interested in is whether that indicates
25 that you have a low level of confidence in the predictions which

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1 you have made as to the effect of the operation of Indian
2 Point Units 1 and 2 on the striped bass population in the
3 Hudson or whether you feel that other information or perhaps
4 the fact that the striped bass differ from the alewife and smelt
5 situation provide enough information so that you have some higher
6 level of confidence in the predictions you have made on the
7 effect of the operation of the two units on the striped bass
8 population in the Hudson?

9 A The degree of confidence I have with regard to the
10 striped bass is fairly high. I might point out that a proper
11 evaluation of the ecological impact involves not only the
12 simple effect resulting from mortality, but also effects which
13 would result from changes in composition of the food organisms,
14 the inter-relationships between species. To have that
15 information, one would have to have more data on the Hudson
16 River itself, the actual food items that form a great
17 part of their diet, and the reasons for the deviations that
18 one would see.

19 Q Let me try to probe a little further on this
20 meaning of reproductive status. Would this require knowledge
21 of the distribution and abundance of the fish species listed
22 here under No. 5?

23 A Yes.

24 Q Would it also require knowledge of the relationship
25 of these eggs and larval stages of the fish to the adult ?

1 populations?

2 A Yes.

3 Q So that we would have to know about the adult
4 standing crop and the fishery, whatever fishery there is, for
5 the bay anchovie, white perch, tomcod, blue-backed herring,
6 alewife, smelt and striped bass, is that right?

7 A Yes. The detailed analysis, just from the simple
8 effects alone, would have to be at least equal to what has been
9 done for striped bass in this particular example.

10 Q When you say that all of the items listed under
11 "E" are needed information, in what sense do you mean that? Are
12 you indicating that no decision should be made as to any
13 kind of restricted operation of the plant until that
14 information is fully collected, or is it needed
15 in some other sense?

16 MR. TROSTEN: Would the Reporter read that question.

17 (The reporter read the record as requested.)

18 MR. KARMAN: I am not quite sure that this is
19 particularly pertinent to Dr. Goodyear's specialized field
20 of expertise.

21 MR. MACBETH: Could I break it up? I apologize
22 for putting in two questions. If he could tell me what he
23 meant by needed information, in what sense is this information
24 needed.

25 THE WITNESS: I think it states fairly clearly what

1 points of the listing is in the first sentence under that
2 section. "In order to properly evaluate the biological impact
3 of operation of Indian Point Units 1 and 2, several
4 questions must be answered and several aspects of the biota
5 must be monitored."

6 BY MR. MACBETH:

7 Q What disturbs me about that is there has been a
8 great deal of evaluation in this Chapter 5, the preceding
9 70 pages, of the biological impact of the operations of
10 Indian Point Units 1 and 2. I am wondering whether that sentence
11 on Roman 5-71 indicates that what has preceded this has not
12 been a proper evaluation, in some sense?

13 A Well, it was only able to focus on a few particulars.
14 If you will read carefully, you will find that almost every
15 section ends without a conclusion, simply because much of this
16 information is not available, or most of this information
17 is not available.

18 Q There has been a good deal of emphasis in the
19 cross-examination so far on the conclusions that were reached,
20 principally about the effect of the plant operation on the
21 striped bass population. Are you in anyway suggesting by this
22 sentence that that evalutaion of the impact on the striped
23 bass population was not a proper evaluation?

24 A No.

25 Q I would like to turn now to the Carlson-McCann Report.

1 There has been a good deal of discussion of the adequacy
2 of that report.

3 First, Dr. Goodyear, could you tell me what year
4 it was in which Dr. Raney made his samplings of striped bass in
5 the Hudson River?

6 CHAIRMAN JENSCH: If you have a document that indicates
7 that, I think insofar as the data are available from prepared
8 documents, you should use it in the question.

9 MR. MACBETH: It is either 1949 or 1954. I don't
10 have the document right here.

11 CHAIRMAN JENSCH: Maybe he can accept the premise
12 and you can proceed unless you have the document
13 readily at hand.

14 MR. MACBETH: I agree. If the witness does know the
15 answer quickly, could I elicit it from him?

16 THE WITNESS: I do know the answer. The meristic
17 studies were based on collections in 1949.

18 BY MR. MACBETH:

19 Q Do you know what the flow characteristics of the Hudson
20 River were like in 1949?

21 A The flows that year were about the second lowest
22 over the period from 1947 -- excuse me, 1935 until presently.
23 The only other period which had lower flows was the drought
24 period in the early '60s.

25 Q Would that indicate that that year it would be more

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1 likely one would find striped bass eggs and larvae in the
2 farthest upstream sections of the river?

3 A Yes.

4 Q So, that is it likely that when Dr. Raney
5 suggested that more emphasis should have been put on the
6 Cocksackie section of the river, that might well reflect
7 Dr. Raney's experience with egg collection, but would not
8 reflect what one would have been likely to find in the years of
9 1966 and '67 when the Hudson River fisheries' investigation
10 was going forward?

11 A Yes.

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Q On page V-22 of the Final Environmental Statement
2 you discuss entrainment. Let me simply read three sentences
3 there:

4 "One of the most important biological
5 consequences of our plant operation with once-
6 through cooling is associated with mortality of
7 organisms entrained in the cooling water. In
8 this way, a power plant is similar to a large
9 predator. The importance of such predation is
10 related to the rate at which the organisms are
11 'consumed' and for passive and nearly passive
12 organisms, consumption rates are similar in
13 magnitude to the rate at which the water is
14 used."

15 Should I understand from that, that the impact
16 which a power plant has on fish populations through entrainment
17 is very largely dependent on the volume of water which it
18 withdraws from the river body in which the organisms are
19 located?

20 A. Yes.

21 I would like to correct something I said a moment
22 ago. It was flow years 1947 to the present, rather than 1935.

23 CHAIRMAN JENSCH: Referring to Dr. Raney's work,
24 is that correct?

25 THE WITNESS: Yes.

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1 BY MR. MACBETH:

2 Q Now, the Indian Points number 1 and 2 plants
3 withdraw approximately 2700 cubic feet per second of water
4 from the Hudson River, do they not?

5 I have deduced that from Table III-1 on page III-9
6 of the Final Statement.

7 A Approximately.

8 Actually, in the analysis the figure 2650 was used.

9 Q On page 40 of the Hudson River Fisheries investiga-
10 tion, the Carlson-McCann Report, it is reported that the
11 Cornwall pump storage project would withdraw an average of
12 18,000 cubic feet per second when it is pumping.

13 I will show you the package so you can be sure of it.

14 (Handing to witness.)

15 Is that correct.

16 A Yes.

17 Q On the other hand, the plant would only be pumping
18 through an eight-hour period of the day.

19 Is that also correct, and reflected on page 40?

20 A Yes.

21 Q So that if we averaged it out over the day, the
22 Cornwall project, Cornwall pump storage project, would withdraw
23 an average of 6000 cubic feet per second, is that correct?

24 A Yes.

25 Q And that would be more than twice as much as is

mm3 1 withdrawn by Indian Point Units 1 and 2, is that correct?

2 A. Yes.

3 Q. Now at page A-V-22 of the Final Environmental
4 Statement -- no, that is the wrong page. I think SA-222, yes.
5 There you discuss the details of the spawning distribution of
6 striped bass in the Hudson River and you say that the species
7 spawns from Kingston to Bear Mountain, with the greatest
8 concentrations of eggs in the vicinity of West Point, although
9 the exact location varies from year to year.

10 And further down in the paragraph you turn to a
11 discussion of the larvae and you say that in that stage
12 of development, the larvae are still unable to move effectively
13 against the currents and will settle to the bottom in quiet
14 water despite efforts to approach the surface.

15 These larvae are reported to be concentrated above
16 the Haverstraw Bay area, with the greatest abundance between
17 Peekskill and Newburgh.

18 Now, does the Storm King pump storage project lie
19 within both of those areas, the area between Kingston and Bear
20 Mountain, and between Peekskill and Newburgh?

21 MR. TROSTEN: I object to the question, Mr. Chairman.

22 I don't see what the relationship of the Storm
23 King project has to this proceeding.

24 MR. MACBETH: I will connect this up in a moment
to the Carlson-McCann report. I just want to demonstrate that

mm4 1 the Cornwall project is in a heavy spawning and larval area.

2 And since there has been heavy reliance on the
3 Carlson-McCann report, I just want that as a foundation.

4 CHAIRMAN JENSCH: All right. Proceed.

5 I think, though, when you say where is Bear Mountain,
6 there must be a map that can tell you where that is, and tell
7 you where Cornwall is. So if you can use some documentary
8 background as a predicate, I think it will move it along,
9 because the witness may have to stop and review a map or
10 something.

11 MR. MACBETH: All right.

12 I think I can find a map which will indicate that.

13 THE WITNESS: I have one here.

14 BY MR. MACBETH:

15 Q Does the map that you are looking at indicate
16 that the Cornwall pump storage project is between Bear
17 Mountain and Kingston, and also between Peekskill and Newburgh?

18 A Yes.

19 Q Let me draw your attention to some of the conclusions
20 reached in the Carlson-McCann report.

21 On page 41 of the report, the authors indicate that
22 in 1966, .6 percent of the eggs, and in 1967, .6 or .5 percent
23 of the eggs of striped bass in the Hudson would be withdrawn
24 by the plant.

25 I show you page 41. Is that correct?

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1 A. Yes.

2 Q. On page 42 of the report they indicate that in
3 those two years, 1966 and 1967, up to 2.8 percent of the larvae
4 in the estuary, striped bass larvae, would be withdrawn
5 by the plant.

6 I show you page 42. Is that correct?

7 A. Yes.

8 Excuse me for a moment. I would like to get my
9 copy.

10 Q. Finally, on page 44, they indicate that between
11 .4 percent and 6.2 percent of the young of the year striped
12 bass would be withdrawn by the project.

13 Is that correct?

14 A. Yes.

15 Q. Now, Dr. Goodyear, is it correct also that it is
16 the eggs and the larvae which would be withdrawn by the method
17 equivalent to entrainment at Indian Point?

18 A. Withdrawal with the water?

19 Q. Yes.

20 A. Yes.

21 Q. Now, Carlson-McCann thus estimate that something
22 like 3.5 percent of the stiped bass eggs and larvae from the
23 Hudson would be withdrawn by the Cornwall project, and addi-
24 tional .4 percent to 6.2 percent of the young of the year
25 would be withdrawn.

mm6 1 At most, that seems to come to approximately 10
2 percent.

3 MR. TROSTEN: Mr. Macbeth, what page are you reading
4 from, please?

5 MR. MACBETH: Those are pages 41, 42, and 44.
6 It is summarized on page 45 in the conclusions, and the top
7 of page 46.

8 MR. TROSTEN: Thank you.

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1 BY MR. MACBETH:

2 Q At most, that seems to come to approximately
3 ten percent of the striped bass eggs and larvae in the
4 estuary. And the Cornwall project, as you indicated earlier
5 on, withdraws somewhat more than twice as much water from the
6 estuary. Could you explain to me how it is that you have come
7 to an estimate that the Indian Point Plants would withdraw
8 30 to 50 percent of the striped bass eggs and larvae, while
9 Carlson-McCann, a report on which you have relied, came
10 to the conclusion that a plant withdrawing twice as much water
11 would only withdraw only ten percent of the eggs, larvae and
12 young-of-the-year?

13 A The answer to your question is very simple. The
14 evaluation of the withdrawal of larvae and eggs that was done
15 in this report --

16 Q This report meaning the Carlson-McCann Report.

17 A Carlson-McCann Report, yes, assumed that eggs
18 and larvae which passed the plant with the tide had a net
19 transport past the plant equal to that tidal current.
20 In other words, they allowed no organisms to be exposed more
21 than once. This effectively made a very substantial error
22 in their calculations.

23 Q How substantial an error?

24 A Something on the order of magnitude -- it would
25 depend again on the flow conditions, the relationship between

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1 the net transport through the zone of withdrawal and the
2 magnitude of the tidal flow which they used as net flow.

3 Q Could you give me some sort of range of what you
4 think that error is? What do you think this Cornwall project,
5 in fact, would withdraw.

6 MR. TROSTEN: Mr. Chairman, I object to this
7 question. I see absolutely no relevance to Dr. Goodyear
8 being asked for an estimate of the eggs, larvae and juveniles
9 which the Cornwall project would withdraw.

10 MR. MACBETH: Dr. Goodyear has relied on the Carlson-
11 McCann Report. I would just like to get some indication
12 from him of how substantial an error he feels was made in
13 this report. It seems to me this is an issue which
14 has been discussed considerably on all sides, and I think the
15 estimate would be valuable.

16 MR. TROSTEN: Dr. Goodyear has not indicated anywhere
17 he relied on the conclusions of the Carlson-McCann Report
18 as far as the percent withdrawal.

19 MR. MACBETH: No, but there has been general
20 discussion of his reliance on the report. I am trying
21 to see just what parts he has relied on, and whether he feels
22 this would be a part that should be relied on at all, and whether
23 it is a minor error or, in fact, a major error.

24 MR. TROSTEN: Mr. Chairman, I reiterate my objection.
25 There is no indication anywhere in this transcript that

1 Dr. Goodyear has relied on the conclusion of the Carlson-McCann
2 Report as to the percent of eggs, larvae and juveniles
3 that would be withdrawn by the Cornwall project. It is quite
4 obvious that Dr. Goodyear has relied on certain of the
5 sampling data taken by Carlson-McCann, to the extent that this
6 is indicated in his paper. But the question, I reiterate my
7 objection to the question on the grounds that it has no bearing
8 on this proceeding, and further that the predicate for the
9 question which Mr. Macbeth stated, is incorrect.

10 CHAIRMAN JENSCH: The Board has been concerned about
11 the Hudson River Fishermen's Association interrogation about
12 withdrawal at the proposed Cornwall plant and has been
13 awaiting the connecting up of the situation. I think as
14 Applicant's counsel indicated, certain data were utilized in
15 some respect by the witness. I think if we get into this
16 withdrawal situation, the volumes of water, you have a serious
17 consideration of what times does Cornwall propose to pump,
18 and the place of the withdrawal, and how large the intake is,
19 and --

20 MR. MACBETH: I don't want to pursue that, Mr.
21 Chairman. I really just wanted to get an estimate from
22 the witness of how large an error this was. I think that
23 would really be sufficient.

24 CHAIRMAN JENSCH: How does that relate to the pro-
25 posed operation of Indian Point 1.

1 MR. MACBETH: I think it only related to, you know,
2 what parts of the Carlson-McCann Report can or should be relied
3 on by all of the witnesses in the proceeding.

4 CHAIRMAN JENSCH: I think that is a different
5 question than the one now pending. If the question is on what
6 part of the Carlson-McCann report did he rely, that is a
7 different question. The objection is sustained.

8 MR. TROSTEN: I also move to strike Dr. Goodyear's
9 conclusion that Carlson-McCann made an error, the authors
10 of the Carlson-McCann Report made an error in their
11 calculations as to the percent withdrawal of the Cornwall
12 project.

13 MR. KARMAN: Unless the Board rules it is totally
14 irrelevant, I see no reason why it should be stricken.

15 MR. MACBETH: Yes. Mr. Trosten himself cross-
16 examined Mr. Clark on this question a few days ago, opening the
17 door to it, and I think it is important for that reason, if
18 nothing else, to have this clear.

19 MR. TROSTEN: Would you identify the pages
20 on which I cross-examined Mr. Clark on the percent withdrawal
21 of the Cornwall project.

22 MR. MACBETH: Not the percent withdrawal, the error
23 in the report.

24 MR. TROSTEN: Mr. Macbeth, you will recall, I am sure
25 that my cross-examination of Mr. Clark had to do with a

1 provision that appeared in his testimony which stated the
2 Carlson-McCann group had made a certain computation of the
3 percentage of eggs in the river. It had nothing to do with
4 the percent of withdrawal by the Cornwall project. If
5 you care to go back and look at the transcript, I am sure you
6 will see this is the case. I have in no way opened the door
7 to this type of interrogation and I move to strike that con-
8 clusion on the grounds that it is improper and irrelevant
9 to this proceeding.

10 CHAIRMAN JENSCH: The ruling will be deferred,
11 we will give further consideration to the matter when
12 both parties present some references to the
13 transcript. Perhaps that can be done during a recess. Proceed.

14 BY MR. MACBETH:

15 Q Dr. Goodyear, did you in any way rely on the
16 conclusions of the Carlson-McCann Report?

17 A No.

18 Q Is there any particular reason why you did not?

19 A Principally because of the error in the modeling
20 they used.

21 MR. TROSTEN: Mr. Chairman, I move to strike
22 that conclusion.

23 MR. MACBETH: I think that is certainly relevant
24 to this proceeding.

25 CHAIRMAN JENSCH: We will defer ruling on the motion

1 until we see what the previous interrogation was.

2 BY MR. MACBETH:

3 Q Dr. Goodyear, I would like to turn now to the
4 question of the effect of the operation
5 of Indian Point Units 1 and 2 for a period of five years and
6 particularly the effect which it would have on the striped bass
7 population. I would like to take this first in terms of the
8 standing crop of striped bass, which is supported by the
9 Hudson. Would you indicate to me what changes in that standing
10 crop you would expect to see over the course of five years,
11 and what I would like is not simply a description of what
12 would happen at the end of the fifth year, which I think has
13 been provided in the testimony, but what the effect would be
14 year to year. This is assuming that the two plants operate
15 at full power for five years.

16 A I am having a problem identifying exactly what you
17 mean when you say the standing stock, the stock that is
5 18 utilized by the fishery?

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1 Q Well, I didn't want the question imply in terms
2 of what the reflection would be in fish caught by commercial
3 fishermen and sportsmen and sports fishermen, but rather
4 of the population that is supported by Hudson spawning striped
5 bass. I will come back to the fishery in a moment. But I
6 would like to start with the population.

7 A Well, what you would see would be a reduction
8 in the number of recruits to each age class by a factor some-
9 where between 0.3 and 0.5, assuming that the flow conditions
10 were similar to the average flow conditions in the estuary.

11 The change would probably be almost imperceptible
12 from a sampling standpoint. I am not sure what more you would
13 want.

14 Q Well, I was aiming partially at the percentage of
15 the whole population that would be affected after one
16 year, two years, three years. You said at the end of five
17 years there would be a 30 to 50 percent reduction.

18 A Well, the first year the reduction would be
19 very small, expressed as a function of the total population.
20 Something on the order of maybe 5 to 10 percent. Even less
21 than that.

22 The second year it would effectively double that
23 value. And the third year would add another equal reduction.

24 The first time you would really see any effect would
25 be at four years and it would be most apparent at the fifth

1 year, although it is very likely you could not discern it in
2 the first six-year cycle.

3 Q Assume that at the end of five years an alternative
4 cooling system, closed cycle cooling system was in operation
5 at the plant or the plant simply didn't operate. How long
6 after that initial period of five years would the effects
7 of the five years of operation be apparent in the striped bass
8 population?

9 A At least for another five years, and perhaps longer
10 than that. It would take approximately one generation to
11 build back to the population that is present now, although the
12 whole process would be modified by the type of mortality
13 in the population at the time it is trying to recover.
14 I can't, there is no way to predict that. So it is difficult to
15 answer your question.

16 Q Am I right in thinking that it is your opinion
17 that at the end of five years of operation there would be a
18 30 to 50 percent reduction in the striped bass population
19 in the mid-Atlantic which is produced by Hudson River spawned
20 striped bass?

21 A Yes.

22 Q Now assuming that that took place and there was such
23 a 30 to 50 percent reduction, what effect would you expect to
24 see in the sports and commercial catch in the mid-Atlantic
25 region directly following the five years of plant operation?

1 A There would be a 30 to 50 percent reduction in the
2 catch for five years, starting five years or four years after
3 the plant started operation.

4 Q In other words, the effects on the fishery would be
5 directly proportional to the effects on the population?

6 A Well, depending upon the response of the fishery.
7 It would be, assuming that the fishing rates stayed constant.

8 Q Do you think that is a reasonable assumption to
9 make?

10 A Reasonably reasonable. It is a very difficult
11 thing to identify.

12 Q Would you expect to see effects in the striped
13 bass population after five years of plant operation in any
14 areas other than the mid-Atlantic region, which you have defined
15 as New York, New Jersey, and Delaware waters?

16 A Well, I would expect that there would be a
17 reduction in Connecticut. There is also a good likelihood that
18 part of Massachusetts would go down, and the rest of the New
19 England area. It seems consistent with the information that
20 I have reviewed that the New England area is also supported
21 to a heavy degree by the reproduction in the Hudson. But
22 there is no real good way of evaluating that.

23 Q In discussing the effect of reduction of the
24 population of the spawning in the Hudson a day or two ago you
discussed the difference between the number of fish which

1 are caught by the commercial and sports fishery and the
2 numbers of fish which escape the sports and commercial fishery.
3 At the time you went over that the distinction you were
4 drawing there was not entirely clear to me. You seemed to
5 put a great deal more emphasis on the escapement rate than
6 on the catch rate.

7 Could you simply explain to me the distinction
8 which you were drawing at that point?

9 A Well, the escapement rate or rather the actual
10 number of fish that escape the fishery and survive to
11 maturity are those individuals which contribute to the
12 spawning activity. That is the reason that the escapement
13 rate is more important than the catch per se.

14 Now really some of the analysis that are presented
15 in the statement should have been more, well, they should have
16 been better characterized as correlation analyses than
17 regression analyses, because the catch units, particularly
18 for the Hudson landings, any time the catch units were used
19 as an independent variable, the regression that occurred was
20 really a regression which should have been one with escapement,
21 but over a wide range of fishing intensities, or actually a
22 narrower range of fishing intensities, the escapement and
23 catch ratio is fairly constant, so that the fluctuations in
24 catch also represent a changing number of fish that escape the
25 catch. and are therefore correlated with the number of fish

1 that are caught. So that that relationship which is the
2 only data base really that exists is the one that is compared
3 with a later catch in the Atlantic.

4 It is an interesting situation because in the
5 regression that is shown between the Hudson and later catches
6 in the Atlantic, if one looks at the fishing intensity data for
7 the Hudson and compares the position of the points in the
8 regression that lie above the regression line, those points all
9 correspond to less than average fishing intensity in the Hudson,
10 whereas almost all of the points below the line represent
11 data sets obtained from a situation where the fishing
12 intensity was higher than the average condition for the period
13 that is examined.

14 CHAIRMAN JENSCH: Is this a convenient place to
15 interrupt your examination?

16 MR. MACBETH: Yes.

17 CHAIRMAN JENSCH: Before we do, I would just like
18 to note for the record in the discussion Mr. Briggs had
19 with Dr. Lawler this morning he referred to certain curves.
20 Those curves are reflected in v-53 of the Final Environmental
21 Statement. You so understood, did you not, Dr. Lawler.

22 DR. LAWLER: That when Mr. Briggs was referring
23 to curves, he was referring to the curves on page v-53?

24 CHAIRMAN JENSCH: Yes.

DR. LAWLER: Is that the verification curve page?

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CHAIRMAN JENSCH: Yes.

DR. LAWLER: Yes.

CHAIRMAN JENSCH: Very well.

At this time let us recess to reconvene in this room at 10:25.

End #6

(Recess.)

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CHAIRMAN JENSCH: Please come to order.

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2 Before we proceed with the interrogation, the
3 Board has some comments about certain plans that we would
4 like to discuss with the Applicant.

5 MR. BRIGGS: We have looked again at the information
6 as it was brought to our attention concerning the research
7 plan, and while there is additional explanation in Appendix G,
8 I believe it is, it seems that it is not at all adequate in
9 view of the importance that is attached to the plan.

10 We would just like to encourage you to provide
11 better information, more information, and even to go to the
12 extent of putting the plan itself into the record.

13 MR. FROSTEN: Thank you, Mr. Briggs.

14 This actually was our intention. Appendix G is
15 a very summary statement. WE intended to cover this further.

16 CHAIRMAN JENSCH: Very well.

17 Dr. Goodyear has resumed the stand.

18 Are you ready, Hudson River Fishermen's Association?

19 MR. MACBETH: Yes.

20 CHAIRMAN JENSCH: Will you proceed?

21 MR. MACBETH: I don't have any further questions to
22 direct to Dr. Goodyear. But I would like to pick up this point
23 about the research on the hydrology, this item 1 --

24 MR. KARMAN: Mr. Chairman, I think possibly
25 Mr. Siman-Tov, who has already been sworn in and who has

mm2 1 testified in this proceeding would be the witness to
2 answer that question.

3 CHAIRMAN JENSCH: Very well, there is no further
4 interrogation at this time of Dr. Goodyear, is that correct?

5 MR. TROSTEN: No, sir.

6 CHAIRMAN JENSCH: The Staff does not have any
7 redirect at this time?

8 MR. KARMAN: Not at this time.

9 CHAIRMAN JENSCH: Thank you, Dr. Goodyear.
10 You are temporarily excused.

11 (Witness temporarily excused.)

12 Whereupon,

13 MOSHE SIMAN-TOV

14 was recalled as a witness on behalf of the Regulatory Staff,
15 and having been previously duly sworn, was examined and
16 testified further as follows:

xxxx

17 FURTHER CROSS-EXAMINATION

18 BY MR. MACBETH:

19 Q Mr. Siman-Tov, I draw your attention to page V-71 of
20 the Final Environmental Statement, under E, needed information,
21 where there is a suggestion that to properly evaluate the
22 biological impact of the operation of Indian Point Units 1 and
23 2, there should be a study of the flow characteristics of the
24 Hudson and within a set zone and Dr. Goodyear told me that
25 zone was that of one tidal excursion in the vicinity of

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1 Indian Point.

2 My question to you is, would you describe to me what
3 would be involved in making such a study as that suggested here,
4 and I would appreciate if you indicated how long it would take
5 and if it is an expensive study. Just elaborate on this
6 paragraph.

7 CHAIRMAN JENSCH: And what does it involve.

8 THE WITNESS: Well, I really am not a monitoring
9 expert, but inasmuch as information is needed, I would
10 say it is a very difficult undertaking.

11 It seems like the most direct approach would be
12 to measure velocities. However, experience is showing
13 that many attempts of doing that end up with getting flows
14 that do not balance between when you average the whole,
15 all of the flows in various cross sections.

16 This is one evidence of the difficulty of getting
17 correct and accurate velocities.

18 So I would say that probably it requires measurements
19 at a large number of points in a cross section, something like
20 about a minimum of 16 points in the cross section, and in
21 addition, we have, as indicated, a pretty long range of
22 interest, which is the tidal excursion at Indian Point might
23 be something like 7 miles upstream. And we will assume it is
24 something like about another 15 miles downstream.

25 And in addition to that, it depends on the interest

mm4 1 of the type of flow we want to check. If there is a special
2 interest like in the case of thermal discharges in the most
3 dry year, then, of course, we have to wait until mother nature
4 blesses us with a certain year.

5 So, it is a matter of that, too.

6 BY MR. MACBETH:

7 Q Not all of us living in New York think of a bad
8 drought year as a blessing.

9 A Well, what is considered as a dry year, I would
10 say it has been, as much as I remember, once in ten year s.

11 Q Is this information needed principally for the modeling
12 the thermal plume or for the description of the transport
13 of passive biological organisms?

14 A For both.

15 Q And I want to get some sense of how crucial
16 you feel this information is.

17 Despite the fact you do not have this information, do
18 you still have a high level of confidence in the transport
19 model for striped bass eggs and larvae, passive striped bass
20 organisms which has been developed and presented in the
21 Final Environmental Statement?

22 A Well, that is a question that I will leave again
23 to Dr. Goodyear.

24 The prediction depends on a lot of problems that
25 are not strictly hydraulics.

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1 As far as the hydraulics is concerned, I would say
2 that overall there is enough data to get the conclusions,
3 but certainly there is a need for additional information to
4 improve it.

5 MR. MACBETH: I think that concludes my
6 cross-examination of Mr. Siman-Tov.

7 CHAIRMAN JENSCH: I guess that concludes the
8 examination we will undertake at this session, is that
9 correct?

10 MR. MACBETH: Mr. Chairman, I was going to offer
11 the cost-benefit witness. This will not take long, but I would
12 like to get this over at this time.

13 MR. TROSTEN: Mr. Chairman, while Mr. Siman-Tov
14 is on the stand, based upon his answers to Mr. Macbeth's
15 question, Dr. Lawler has one or two questions.

16 CHAIRMAN JENSCH: Very well.

17 BY DR. LAWLER:

18 Q I havetwo questions, Mr. Siman-Tov.

19 One is, you commented on the lengths of the tidal
20 excursion in the downstream direction. It was difficult to
21 hear what you said.

22 A I did not comment about the tidal excursion in
23 downstream.

24 I tried to put a limit to the range of interests
25 we might have. The tidal excursion would be roughly the same

mm6 1 in the upstream as the downstream, if we are talking about a
2 dry year, at low fresh water.

3 Q What you are suggesting is the distance in miles in
4 the downstream direction, in which you indicated the study
5 should extend to, was not based on your estimate of the tidal
6 excursion in that direction?

7 A No.

8 Q What was that distance?

9 A Well, it depends now from this point of view,
10 which matter we are talking about.

11 If it is the transport model, then I am just
12 following what Phil recommended in here, to go up to the
13 Haverstraw Bay.

14 Inasmuch as the thermal is concerned, then it depends
15 on what lengths it takes for the thermal plume to decay.

16 MR. KARMAN: Might I interject?

17 By Phil, you refer to Dr. Goodyear?

18 THE WITNESS: Yes.

19 BY DR. LAWLER:

20 Q You gave a number and I didn't get it.

21 A I made a guess of what distance it takes between
22 Peekskill and Haverstraw Bay. It might be correct or wrong.
23 I gave 15 or 14 miles.

24 Q Thank you.

25 My second question is, you also commented on

mm7 1 something to the effect about mother nature providing us with
2 a, I think a flow year, in which we could do the kinds of things
3 you are suggesting need to be done.

4 Could you indicate what you meant by that?

5 A. Inasmuch as the thermal discharge is concerned,
6 we are looking for the more severe situations.

7 That means in the type of flow where the fresh water
8 flow is what we consider at a minimum. We are talking about
9 2000 and almost an absolute minimum 2000 cubic feet per second,
10 and 4000 as being a reasonable minimum.

11 Inasmuch as I know this does not occur every year,
12 the salt intrusion zone, or what we call density induced
13 flow, the front of this zone propagates and changes its location
14 depending upon the fresh water flow.

15 So there would be different dynamics of the hydraulics
16 in the location of Indian Point, depending on what type of
17 fresh water flow exists at that time of the year, at this
18 certain year.

19 Q. Are you suggesting in your opinion that we have to
20 wait for a low fresh water flow of 2000 cfs before we make these
21 measurements?

22 Or, did I understand you to say a reasonable low
23 flow would be 4000 cfs?

24 A. 4000 would be a reasonable minimum.

25 Q. With respect to that value of 4000 cfs, where is that

1 measured?

2 A. Where is that measured?

3 Q. Yes.

4 A. Above Indian Point.

5 Q. How far?

6 I will make it easy. Do you mean the flow as measured
7 at the federal dam in Troy?

8 A. I guess so.

9 Q. This is the fresh water flow?

10 A. Yes.

11 Q. Is it your contention a flow of 4000 cfs does not
12 occur every year in the Hudson River?

13 A. I believe so, yes.

14 Q. Is it your contention that in most years a flow of
15 4000 cfs, or would you expect that a flow of 4000 cfs would
16 occur in most years, if not in all years?

17 A. The way I remember it right now, it is not very
18 common to get this type of flow, although even though I
19 mentioned the 4000 might be a reasonable minimum, 3000 may be
20 also considered even better measurements.

21 Q. So I am not certain exactly how often we will get
22 the type of flow that we would have interest in?

23 Q. And this interest is with respect to the evaluation
24 of the thermal model, or the evaluation --

25 A. I am talking mainly of the thermal model. I am not

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mm9 1 sure about what are the requirements for, or what type of mini-
2 mum flow Dr. Goodyear would consider as being representative
3 for entrainment model.

4 DR. LAWLER: Fine.

5 Thank you.

6 CHAIRMAN JENSCH: Are there any further questions
7 of this witness?

8 MR. MACBETH: No, Mr. Chairman.

9 CHAIRMAN JENSCH: I wonder if I understand the
10 suggestion by the Staff -- perhaps this is directed to
11 Staff counsel -- that several questions must be answered.

12 Do you mean the following several questions, or
13 several out of those listed there?

14 MR. KARMAN: These are the questions, Mr. Chairman.

15 CHAIRMAN JENSCH: The following questions?

16 MR. KARMAN: Yes.

17 CHAIRMAN JENSCH: The following questions must be
18 answered.

19 I am having difficulty -- perhaps this can be
20 developed later rather than taking the time of the witness --
21 with such difficult feasible programs in part here, and I
22 just wonder whether some of this is unrealistic or not.

23 As I understand it, it will take ten years for
24 some things, it is quite difficult to do it, and this
25 gentleman indicated a lack of expertise in some respects in

mml0 1 this field.

2 I think it seems to a layman, myself, as a very
3 complete list, but how realistic is it?

4 Are we being fanciful?

5 MR. KARMAN: This would be an ideal list.

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1 Whereupon,

2 GEORGE KNIGHTON

3 CHARLES M. CARTER

4 were recalled as witnesses, and, having been previously duly
5 sworn, were examined and testified further as follows:

6 FURTHER CROSS-EXAMINATION

7 BY MR. MACBETH:

8 Q Just a simple question of clarification first. On
9 page Roman 11-45 of the Final Environmental Statement, under
10 chemical discharges of the ambient air, you stated under 5-1
11 that the environemntal costs, taking all alternatives, will be
12 25 percent. It seems to me it has to be 25 percent of something.
13 I was wondering what it was 25 percent of?

14 A (Carter). Twenty-five percent of the federal air
15 quality standards.

16 Q Thank you. At page small V of the Summary
17 Conclusions you listed under No. 5 there the principal
18 alternatives which you considered in writing the Final
19 Environmental Impact Statement. I do not see there anywhere
20 a consideration of the alternative that before a closed-cycle
21 cooling system is installed and operating at Indian Point,
22 that the plant not operate during certain months of the year which
23 would be those in which there would be the highest effect
24 on the striped bass population due to entrainment and impingement.
25 Did you consider such an alternative?

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1 A (Carter) Let me refer you back to another section
2 where it is pointed out more clearly, I think. Page XI-74.
3 The bottom paragraph on that page, where it is speaking of
4 a plan that is to be submitted by the Applicant July 1, 1973.
5 The last sentence says, "This plan should include means of
6 reducing to a practical minimum fish kill from cold shock,
7 entrainment of fish eggs, larvae and plankton, and provide
8 for limited use of toxic chemicals and for corrective measures
9 such as aeration of the cooling water during periods when
10 concentrations of dissolved oxygen in the thermal plume are
11 reduced below 4.5 parts per million."

12 This is a part of the plan of action to minimize
13 the detrimental effects during the interim period of
14 operation. We did not spell out what the methods are that the
15 Applicant should use to minimize these effects.

16 Q So that, am I right, in assuming from what you have
17 just said that you anticipate that on July 1 of this year, the
18 Applicant will produce a plan for the operation of the plant
19 until January 1, 1978, and that it might well-include
20 operating the plant in say, June or July, and from the middle
21 of December to the first of March?

22 A It could include such a plan, yes.

23 Q And is the Staff presently planning to consider
24 that kind of limited operation during the period before
25 1978, at the time the Applicant comes forward with his plan on

1 July 1?

2 MR. KARMAN: I am not sure I understand that question
3 in light of the previous answer, Mr. Chairman. The Final
4 Environmental Statement has indicated that the Applicant
5 will come in with this, there are certain items mentioned in the
6 paragraph on page 11-74, which might be taken into considera-
7 tion. And the specifics of what the Staff is going to require
8 from the Applicant in this plant have not been formulated
9 as of yet. I think Mr. Carter indicated that in his
10 testimony.

11 MR. MACBETH: Maybe I was vague about it. That is what
12 I am driving at.

13 BY MR. MACBETH:

14 Q I take it in the Final Environmental Impact
15 Statement and to date the Staff has not analyzed the
16 alternative of some form of limited operation between the
17 time the plant starts up, if it ever does start up,
18 and January 1, 1978. Is that correct?

19 A (Carter) That is correct.

20 CHAIRMAN JENSCH: I wonder if that question could
21 be reread, please.

22 (The reporter read the record as requested.)

23 CHAIRMAN JENSCH: Will you have an opportunity
24 to, will the Staff have an opportunity to give consideration
25 to the subject of that question before our March 5 session?

1 WITNESS KNIGHTON: We can make a comment on it now,
2 sir. And that is that in the evaluation -- there is
3 nothing written in the text which covers any alternative,
4 other than full power operation for five years with once-
5 through cooling. Then into a closed system, after 1978,
6 January 1978, into a closed system. That is what is
7 in this text. And the base of it is that we have identified
8 the need for power, the significance of it, and what we have
9 found is that if we allow, if we meet that need, which is very
10 significant, once-through operation should not have irrecoverable
11 impact. It so happens that the time period that one might
12 want to cut back on power happens to come along with the
13 need for power. They synchronize, they come together. If you
14 cut back here on a nuclear plant, you are going to end up using
15 fossil plants during the very same time --

16 CHAIRMAN JENSCH: Or hydroplants from Canada.

17 WITNESS KNIGHTON: Or hydro from Canada, if it
18 is available.

19 CHAIRMAN JENSCH: Fossil fuel plant if it is
20 available. Everything is available, so that is a
21 common premise.

22 WITNESS KNIGHTON: Yes. The point is if we go as
23 stated to fossil plants, we end up with air pollution problems
24 at the time we really don't need them, it is already bad,
25 during the summer months.

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1 CHAIRMAN JENSCH: We have sulfur oxides, nitric
2 oxides already taken out by 1978.

3 WITNESS KNIGHTON: This is for the next five years,
4 sir.

5 CHAIRMAN JENSCH: I just wondered if you considered
6 enough alternatives as a practical adjustment to the problems
7 that everybody is concerned with, protecting the environment
8 and preserving the ecology of the area.

9 WITNESS KNIGHTON: We believe we have on the
10 basis of terrestrial and aquatic together, in terms of people
11 versus fish. This is the approach we tried to take here.

12 MR. MACBETH: My point, Mr. Chairman, is that such an
13 analysis is not included in the statement, and as far as I can
14 can make up has been made only in the grossest terms by the
15 Staff. Certainly, there are competing considerations that
16 have to be weighed here. But I think everyone realizes that
17 in June and July the power demands on everyday, in every part
18 of everyday, is not the maximum load on Consolidated Edison's
19 system. To take the most obvious example, the nights are
20 cooler than the days. And there is considerably more power
21 available at night than there is during the day, I mean
22 in the sense of the relationship between supply and demand.

23 Again, there are periods of June and July which are
24 cooler than other periods. It seems to me that the National
25 Environmental Policy Act, and Frankly common sense, require in

1 this situation, where the impact of the operation of the
2 plant is focused very much at two or three specific times
3 of the year, that a finer analysis should be done by the
4 Staff to comply with the terms of the act. It may be that
5 when the Staff has done that analysis, their judgment would
6 still be that the plant should operate at full power for the
7 whole five years.

8 But until that analysis has been done, I really
9 think we don't have the evidence to go forward on. I
10 was about to move the Board at the end of the cross-examination
11 to request the Staff to make such an analysis. There are
12 obviously various ways it can be looked at, simply turning
13 the plant off at certain times of the year, or allowing
14 it to operate in those times only when it is absolutely
15 essential for power in the City of New York and Westchester
16 County. There are a number of alternatives there. But
17 I think the course of the cross-examination and presentation
18 of testimony in this proceeding has made it clear we are
19 dealing with something in rather fine terms now, we are
20 no longer talking grossly about the plant operating and not
21 operating.

22 I think the analysis of the Staff took has
23 to come down to deal with that kind of more finely grained
24 picture. So that I take it the Board has already requested
25 such an analysis be made, but if that isn't sufficiently clear

1 on the record, I would move the Board to request that of the
2 Staff. I have contended that the statement is inadequate
3 until such an analysis is made.

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1 CHAIRMAN JENSCH: The Board believes that further
2 alternatives should be considered or some kind of a recommen-
3 dation or judgment by the Staff of these things. I think
4 power supply is a very important part of this problem. I
5 have forgotten what the dates are, they may be in the record,
6 but I know that it has been reported that Con Edison is work-
7 ing to secure additional outside gridding benefits and maybe
8 this is one of the things that would play a part in the
9 kind of recommended operation. I don't know when the Quebec
10 power is likely to come.

11 I read in the New York Times that a contract has
12 been reached on price for a certain supply, and there may be
13 more coming. It may be that all kinds of problems will have
14 to be resolved, direct current transmission, alternate current
15 transmission, all of that sort of thing. But these things
16 seem to me at least to require some alternative consideration.
17 Full power assumes a certain amount of power, and whether that
18 amount of power is procurable from other sources -- let me
19 ask the Hudson River Fishermen's Association a question.

20 In your opinion or in the opinion of your client,
21 is it the recommendation that as one means of preserving the
22 ecology that there be a restricted operation of Indian Point
23 2 in certain months of the year?

24 MR. MACBETH: Yes, it is, Mr. Chairman. That is
25 reflected in papers which were filed with the Board in, I

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1 believe, November in which the position of the Hudson River
2 Fishermen's Association is set out. Essentially the position
3 is that in the period between the 15th of December and the
4 1st of March, when impingement is greatest, and in the period
5 of June and July, when entrainment is greatest, that the
6 Indian Point 2 should only be used when it is absolutely
7 essential for power for New York City and West Chester County
8 and every effort should be made to use other plants, to
9 purchase power from outside of the Consolidated Edison
10 service, to encourage energy concentration. And the position
11 of my client is that the Indian Point 2 plant should only be
12 used essentially as a last resort.

13 CHAIRMAN JENSCH: That is during the period until
14 it is determined whether towers --

15 MR. MACBETH: Until there is a closed cycle
16 cooling system in operation at the plant. We would agree
17 with the Staff that after January 1, 1978, if there is no
18 alternative system in operation, the plant simply should not
19 operate. But in that interim period, it is our contention the
20 plant should only be operated in those periods of the year
21 when absolutely necessary. Of course the plant must be shut
22 down for scheduled maintenance for eight weeks of the year.

23 It seems to us it would make sense to put that
24 period in in the winter or the summertime when the impingement
25 and entrainment are greatest. But if the company chooses

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1 not to do that, our feeling is still that the operation of
 2 the plant should be restricted. I think it is perfectly
 3 obvious if one thinks about the weather in New York in
 4 June and July, there are a number of weeks when it is cool,
 5 in fact peak demands are not on the system the whole time,
 6 and when they come, it is only for short periods, usually
 7 from about 3 in the afternoon until 8 in the evening, and
 8 if the plant's operation is restricted along the lines
 9 suggested by the Hudson River Fishermen's Association, the
 10 need for power in the City of New York and West Chester
 11 County will be met, but at the same time there will be
 12 maximum protection for the striped bass and the other fish,
 13 aquatic organisms in the river.

14 It seems to the Fishermen's Association that that
 15 is the best method of balancing the competing interests
 16 that are present here.

17 CHAIRMAN JENSCH: Well, I don't know, it seems to
 18 me the whole energy situation is getting a great deal of
 19 widespread consideration today. I don't know whether North
 20 Sea Oil will be low sulfur oil or whether Algerian Oil will
 21 be available in low sulfur amounts, whether gas turbines --
 22 as I understand it, Con Edison is adding these and has used
 23 them -- will help the peaking requirements.

24 I think it is almost a changing picture that we have
 25 to ask for.

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1 I understand the Electric Institute is undertaking
2 a greater effort on research on the different nitric oxides
3 and so on in coal. Maybe there is some progress report on
4 that. Even the operation, as I understand the projection
5 by Con Ed, even the operation of its existing older plants
6 won't supply all of the power that is needed. So it looks
7 like some outside sources will have to be considered of some
8 kind.

9 I take it the Hudson River Fishermen's Association
10 would recognize that even in the period from the 15th of
11 December to the 1st of March, and even in June and July there
12 might be necessity for operation of Indian Point 2 at some
13 period of time, a day or two, a week or so, when peaks were
14 anticipated.

15 Do you not agree?

16 MR. MACBETH: That is absolutely correct, Mr.
17 Chairman.

18 CHAIRMAN JENSCH: It seems to me this type of thing,
19 since this is one of the contentions of the parties, might
20 well be within the range of review by the Staff as to its
21 judgment of the feasibility and practicality of that type of
22 operation.

23 Applicant?

24 MR. TROSTEN: Yes, Mr. Chairman, I think there are
25 three points I would like to bring up.

1 The first is that as I have indicated in response
2 to Mr. Briggs' question, we do intend to deal with this
3 matter of the benefit-cost analysis, and various alternative
4 operating modes with once-through cooling. It is our intent
5 to present evidence in this proceeding with respect to this.

6 The second point I would like to bring out is this,
7 that I think under the National Environmental Policy Act it
8 is essential that any analysis of this character that is
9 conducted by the Atomic Energy Commission or its constituent
10 elements reflect the benefit-cost balance.

11 What Mr. Macbeth is saying is focused on one aspect
12 of this, and that is whether the power is very, very much
13 needed in order to supply all requirements without considering
14 the environmental aspect of this, without considering the
15 financial aspect of this, without considering all aspects of
16 this that go into a cost-benefit analysis.

17 So I think the Intervenors have sort of tunnel
18 vision about this particular subject. They do recognize --
19 it is not tunnel vision in one respect, in that they do recog-
20 nize the need for power. But in all other respects they are
21 focusing on their understanding of the damage that will be
22 done to the fish in the river and eliminating all other
23 aspects of it.

24 The third point I would like to bring out is I
25 think under the National Environmental Policy Act, there is

1 a limit to the extent to which the Atomic Energy Commission
2 or its constituent elements delve into all of the ramifications
3 of this.

4 As the Chairman very aptly pointed out, this is
5 a very, very much changing matter, where we are dealing
6 with a period which under the Staff's recommendation is a
7 period from July '73 to January 1, '78, and there are many,
8 many things that could come about, power needs could change,
9 technology could change, requirements could change, fuel
10 availability could change and so on.

11 So there is very distinctly a limit I think which
12 the Staff has sought to recognize in a general way by not
13 dealing with this thing, except in a general sense. I
14 certainly agree that any consideration of this has to be very
15 careful, and has to reflect all of these things. But there is
16 a limit to the extent to which at a particular point in time
17 you can cover all of these points.

18 CHAIRMAN JENSCH: I don't know what presentation
19 will be made, how many gas turbines Con Ed has, how many are
20 they planning, how many can they add in June or July. Some-
21 times it gets pretty warm, and you get a peak demand in a
22 hurry. Whether gas turbines can be thrown on the line within
23 minutes, 30 minutes or so, as I understand the claim of the
24 manufacturers, to throw the gas turbines on the line --
25 there might be a lot of temporary ways to alleviate the

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1 situation until a greater study has been completed of the Hudson
2 River.

3 I think despite Dr. Edward Teller's statement that
4 appeared in the New York Times this morning that he prefers
5 people overfish, I don't think it is quite that simple, and
6 I think that throughout the nation there is a concern and a
7 demand that the ecology be preserved.

8 Now whether it means we will have to destroy the
9 ecology for a couple of years or lessen its present condition
10 in some way until some of these other people interests
11 can be accommodated, and then hopefully build it back up,
12 I think are problems that we will have to consider in this
13 proceeding.

14 MR. KARMAN: Of course, Mr. Chairman, you understand
15 that the Staff's Final Environmental Statement was based on
16 evaluating the impact and as is indicated by our recommendation
17 that a closed cycle system be installed by January 1978,
18 it is equally apparent we are aware of the environmental
19 impact of the short-term operation prior to the installation
20 of the closed cycle cooling system and this was all worked
21 into the recommendation which is that for that short-term period
22 the benefits would outweigh the costs on the continuation of
23 the operation of the plant, without narrowly defining restricted
24 operations as such.

25 CHAIRMAN JENSCH: Well, excuse me for interrupting.

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1 Will you proceed with your examination?

2 MR. MACBETH: That concludes my examination of
3 these witnesses. That is really the point I was driving at.
4 There is a related legal matter it might be worth taking up
5 at this point.

6 MR. TROSTEN: Might I just remark, Mr. Chairman,
7 I have a few questions for Mr. Knighton and Mr. Carter.
8 But they are related in some way to the answers to one of my
9 questions at the last session of hearings which ^{was} was given to
10 me this morning and I think under the circumstances the
11 best thing to do would be to defer my few questions until
12 I consider this information that was handed to me this morning.

13 CHAIRMAN JENSCH: Very well.

14 Do you have any redirect at this time, Staff?

15 MR. KARMAN: Not at this time.

16 CHAIRMAN JENSCH: Thank you, gentlemen, you are
17 excused temporarily.

18 (Witnesses temporarily excused.)

19 CHAIRMAN JENSCH: Did you desire to make a further
20 statement?

21 MR. MACBETH: Yes. Mr. Chairman, on December 8
22 the Hudson River Fishermen's Association and the Environmental
23 Defense Fund served on the Applicant requests for admission
24 of facts and genuineness of documents. There are four items
25 listed there.

1 The first has to do with the ability fo the
2 plant to move from low power levels to high power levels in
3 certain periods of time.

4 The second has to do with the area from which water
5 is withdrawn into the plant.

6 The third with the sensitivity of the cubic ion
7 sensor.

8 And the fourth with the Burns and Rowe report.

9 The Applicant and the Hudson River Fishermen's
10 Association are working to produce a summary of the Burns and
11 Rowe report in light of the discussion and order from the
12 Board in the December hearings. And they are also working
13 to produce a statement on the zone of water withdrawal, which
14 will be satisfactory to both parties.

15 The Applicant felt perhaps more information should
16 be included there and we are certainly willing to try to find
17 a statement that satisfies both parties.

18 I don't think the ion sensor is worth squabbling
19 about, but the first one here I think is important. I have
20 discussed it with the Applicant's counsel, and it is my
21 understanding that the Applicant's counsel objects to the
22 admission of facts stated there on the basic grounds that
23 there is no foundation for them in this proceeding.

24 It is the position of the Hudson River Fishermen's
25 Association that there certainly is sufficient foundation to

1 have facts in the record as to the ability of the plant to
2 move from low power levels to higher power levels.

3 This is obviously relevant to the whole question
4 of what kind of restricted operation is feasible at the plant.
5 It is my position that the Hudson River Fishermen's Association
6 really has to make out no more than a very minimum prima facie
7 case indicating that this kind of restricted operation would
8 have benefits to the fish and would not have adverse,
9 in fact I don't think we have to go any further than that,
10 just would have benefit to the fish.

11 I think in fact the Hudson River Fishermen's
12 Association, and for that matter the other evidence in the
13 record from the Staff and the Applicant, demonstrates clearly
14 that there is a very strong case, and I think obviously a
15 persuasive case on the preponderance of the evidence that
16 there will be very severe impacts on the fish population through
17 the operation of the plant, and therefore that some form of
18 restricted operation of the plant should be inquired into
19 and is a relevant matter for which a perfectly sufficient
20 foundation has been laid.

21 And therefore I would move the Board to overrule the
22 objection raised by the Applicant to the admission of item 1
23 in the request for admission of facts and ask that the factual
24 material there, which was a response by the Applicant to a
25 question put to it by the Hudson River Fishermen's Association

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1 in discovery, be admitted into the record to be treated
2 in the same manner as other evidence in this proceeding.

3 If the Board would like, I have a copy of the
4 request for admission of fact here and can show it to the
5 Board.

6 (Handing.)

7 CHAIRMAN JENSCH: Any objection from the Applicant?

8 MR. TROSTEN: To giving it to you?

9 No.

10 Mr. Chairman --

11 CHAIRMAN JENSCH: Yes, we have given consideration
12 prior to this and heard the argument and we would like to hear
13 from you now.

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End #9

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1 MR. TROSTEN: In the first instance I would like
2 to say events have sort of marched on and I think it would be
3 well to defer a ruling on Mr. Macbeth's motion until after
4 the evidence is submitted by the Applicant in response -- in
5 connection with Mr. Briggs' question about the operating of
6 the plant. I think it is sort of premature to rule on this.
7 The second point I would like to make is that there is a
8 basic question which the Board might wish to consider, if it
9 does agree to defer ruling on this, and that is that I think
10 it is incumbent on the Hudson River Fishermen's Association
11 to do more than simply come forth with a statement that they
12 think the plant ought to be shut down during these two high
13 demanders. I think they ought to come forward with some sort
14 of analysis, some more specific statement of their position
15 in this respect, instead of simply saying the plant ought
16 to be shut down.

17 I think they are a party in this proceeding and
18 they ought to present something more specific than they have.
19 I think this is something --

20 CHAIRMAN JENSCH: Is it your thought they should
21 seek a subpoena to get the data to support their contentions?
22 Or interrogatories or --

23 MR. TROSTEN: No, the data are available to them.
24 This is another matter like the research program, Mr. Chairman,
25 where the data are available to them, we are perfectly prepared

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1 to discuss it with the Intervenors, but they their mind set
2 on this particular point and in their view there is no need
3 to come forward with anything more specific, because they have
4 made up their minds about what has to be done here. It just
5 seems to me this is another case where I think they ought to
6 be more specific about their request.

7 CHAIRMAN JENSCH: I thought the request for
8 admission of facts and genuineness of documents is in a sense
9 a discovery procedure to have facts available or to have
10 positions established which will obviate the presentation of
11 data.

12 MR. TROSTEN: We have made the data available to
13 them and we have no problem with them examining it, considering
14 it, and that is what what it purports to be, an answer to a
15 question that we provided to them.

16 MR. MACBETH: We have examined it, we have considered
17 it, and we would now like to have it in evidence in this pro-
18 ceeding. We have stated, I think, a perfectly straightforward
19 contention as to the balance between the need for power and
20 the effect of the operation of the plant on the Hudson River
21 Fishery and the other aquatic biota. If the Applicant has
22 some other argument it wishes to make, such as, you know, air
23 pollution in the city of New York, or costs, the Applicant is
24 free to make such arguments and present evidence. The
25 Fishermen have put forward their case, they have demonstrated

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1 that the plant can be run in this method on the basis of the
2 facts there, and the scheduled maintenance and so on. They
3 have put in evidence as to the effect on the fish, I think
4 rather extensive evidence. And I think that the Fishermen
5 have made out a prima facie case with considerably more
6 strength than most intervenors make in these proceedings, if I
7 may say so.

8 If the Applicant has an argument on the side,
9 he is free to come in and present it. But I don't see any
10 reason why the intervenors have to engage, you know, in
11 endless investigation of facts that are clearly under the
12 Applicant's control. This would just be a long expedition
13 in which we have to keep dredging up more and more material.
14 The question of how much does this cost, how much gas comes
15 out of the stocks and so on is obviously information under the
16 Applicant's control. The Intervenors here, or I doubt many
17 public or private bodies in the New York region have the kind
18 of information on that as the Applicant has. I have no
19 objection to the Applicant making such an argument. But I
20 don't see that as any basis for saying this statement of
21 fact, which the Applicant agrees is true, as far as I know,
22 should not be in evidence in this proceeding.

23 MR. TROSTEN: Mr. Chairman, this is a clear instance
24 where a party which is proposing a condition has a burden
25 under the Commission's rules with coming forward and presenting

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1 evidence and complying with the Commission's rules.

2 CHAIRMAN JENSCH: I think your statement does indi-
3 cate what the focus of this concern is in this consideration.
4 The person asserting the condition has the burden to establish
5 it, of course. The question is how. As I understand the
6 Federal Rules of Civil Procedure on the question of discovery
7 or request for admission and genuineness of documents, those
8 rules are intended to expedite a proceeding, obviate the
9 necessity of detailed presentation of facts, that positions
10 can be generally acknowledged and established, and it is a
11 means to assist a party to bear the burden that it has to set
12 forth factors that they believe will sustain their position.
13 Now that doesn't preclude responses or disagreements in any
14 way.

15 MR. TROSTEN: I agree, Mr. Chairman. The focus of
16 this is such that I think it is because the Applicant is
17 coming forward with evidence that I think it would probably
18 be well to defer a ruling on the specific question that this
19 particular admission go into evidence, because I really don't
20 think that is the basic point. We are not really -- that may
21 have been a rather shorthand answer to his question. But
22 we did answer his question in this respect. And that isn't
23 the real -- that is not the real argument here.

24 MR. MACBETH: I don't understand the real argument.

25 CHAIRMAN JENSCH: Supposing we accept your

5mil 1 suggestions, Applicant, that we defer the ruling on the
2 motion and supposing when the evidence is presented by Applicant,
3 it doesn't quite meet it, then you would have some problem
4 of is the Intervenor going to be charged with inordinate
5 delay; he says how about my request, and you say this is
6 awfully late now. Maybe the thing to do is for the Board to
7 indicate to the Applicant now, we are going to tentatively grant
8 this procedure and request you do respond in this regard.
9 We will defer a formal ruling until we see the evidence, what
10 it looks like. If your evidence confirms this request that
11 will assist in coming more quickly to a decision. But it
12 appears to the Board that the request should be granted and
13 the Applicant should come forward with a response respecting
14 this matter. I think that is the purpose of the Federal
15 Rules of Civil Procedure to work out a mechanism to save time
16 in hearings and detailed presentation of facts.

17 MR. TROSTEN: These particular facts are not really
18 the focus of the problem. The rules say any party may make an
19 objection on the grounds of relevancy or materiality and
20 that was the basis of the objection.

21 CHAIRMAN JENSCH: We will overrule those objections
22 to this request, so we are ready to take up the next phase
23 of it. This calls for some kind of a response, and it seems
24 to save the time of the hearing if we have the position of
25 the Applicant known as soon as possible.

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1 MR. TROSTEN: Mr. Chairman, do you not agree that
2 it is the burden of the Intervenor to come forward with some-
3 thing to support his condition, other than to state that there
4 ought to be such a condition.

5 CHAIRMAN JENSCH: Oh, I think that is part of the
6 rules. I understood that is what the purpose of this procedure
7 was, to bear that burden.

8 MR. MACBETH: Yes. I think the rest of the evidence
9 presented by the Applicant and other evidence in the record
10 also helps to bear that burden.

11 CHAIRMAN JENSCH: Oh, yes, it isn't solely one
12 point. It is part of the burden you have to bear.

13 MR. BRIGGS: The Intervenor has provided evidence
14 indicating that in their calculations there will be a
15 substantial reduction in the fish population as a result of
16 this operation, but they haven't put any numbers, I guess,
17 on what the cost is in comparison with the benefit that one
18 gets from running the plant full-time. Is that your problem?

19 MR. TROSTEN: They have put a very specific estimate
20 in of the reduction in the Hudson River population and there
21 was something in Mr. Clark's testimony about values which I
22 gather is being rethought, sent back for refabrication,
23 excuse me, for --

24 MR. MACBETH: I am glad you withdrew that before I
25 objected to it.

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1 MR. TROSTEN: That was an unfortunate choice of
2 words, excuse me. But it is being rethought, and reconsidered
3 by Mr. Macbeth and Mr. Clark. So there are some numbers
4 that have been put in having to do with the value of the
5 fishery. But there have been no other calculations put forward
6 by the Intervenors as to the benefits versus the costs of
7 operating the plant in the restricted mode that they propose
8 during the period of time of closed cycle operation, nor for that
9 matter has there been any other benefit versus cost analysis
10 by the Intervenors.

11 The Staff has a benefit-cost analysis.

12 MR. MACBETH: It is the Fishermens' position that
13 the position that the plant should operate to meet legitimate
14 needs for power in New York City and Westchester County.

15 CHAIRMAN JENSCH: At certain times of the year.

16 MR. MACBETH: No, I think the Fishermen have gone
17 further than that. Their actual proposal is when the plant
18 is absolutely essential to meet the legitimate needs for power,
19 the plant should be run during the five-year interim period.
20 Actually the Fishermen also contend that the construction
21 schedule can be reaccelerated, but we realize that towers
22 cannot be in place and operating tomorrow. But before that
23 time the plant can be operated to meet, when essential, the
24 need for power in New York City and Westchester County. It
25 seemed to us that balanced the benefits from the plants

8mil

1 against the costs. If the Applicant wants to come in and
2 say in fact the Intervenors ignored other costs that are of
3 vast importance, they will be so much, the SO₂ in the air
4 in New York will be so much cost per day for not running
5 this plant and running another plant, I think the Applicant
6 is free to do that. But I don't think it makes sense to say
7 the Intervenors have not come forward and tried to show what
8 the costs of operating the plant without a closed cycle
9 system are and they have paid no attention to the benefits.
10 It has been my understanding that the benefits to be reached
11 were in fact meeting the need for power in New York City and
12 Westchester County and we have tried to take that into account.
13 We think once that has been met, any other costs that are
14 alleged by the Applicant do not meet the costs that are
15 imposed on the fish and aquatic biota of the Hudson River
16 and the fishery it supports.

17 The Applicant is free to argue that that is not
18 so. I rather anticipate he will. But I don't think it is my
19 job to come forward and make all of this argument for the
20 Applicant. He has got considerably more resources, and he has
21 control of the facts to make that kind of argument.

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MR. TROSTEN: Mr. Chairman, I should point out, just
2 so the record will be clear, that the Applicant has already
3 in the Environmental Statement, presented some evidence
4 concerning the environmental costs of operating fossil fuel
5 plants relative to operating the Indian Point Plant.

6 So the Applicant, even though we have not proposed
7 the specific operating condition, we have come forward with a
8 cost analysis, not a full one of course, but it was a limited
9 cost analysis, and it was an analysis of environmental costs
10 and there is not, as I say, one shred of testimony in this
11 proceeding from Intervenors having to do with the benefit-
12 cost analysis.

13 CHAIRMAN JENSCH: As I understand his statement,
14 that is his benefit-cost analysis.

15 You may object to the sufficiency or the weight of
16 that evidence, but as I understand Mr. Macbeth, he says this
17 is the way we have balanced it out.

18 Maybe it is not the way you think it should
19 be done, but that is their view. We can argue whether their
20 view is right or not, but I wonder whether your statement is
21 correct that there is not a shred of presentation about it.

22 MR. TROSTEN: Mr. Chairman, there is an implicit
23 acceptance of the benefit-cost analysis of operating the
24 plant with once-through cooling during a period of time that is
25 set forth in the Intervenor's contentions.

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In that sense, there is an acceptance of a benefit-cost analysis implicit in that.

But as far as the particular condition that they have proposed, of not operating the plant during these periods of peak demands, although they have specifically presented the environmental costs, or you can derive the environmental costs that they imagine would occur during this period of time, there is nothing in their testimony that attempts to describe in any way, the environmental costs associated with not operating these plants during this period of time, or the financial costs associated with not operating the plant during this period of time.

There is simply nothing in their testimony on this subject. It is that to which I was directing my remarks.

CHAIRMAN JENSCH: I don't know that the statements of Intervenors have yet been fully defined in these proceedings, but taking into consideration some of the Court positions of Intervenors, they present substantial matters for consideration and as I understand Mr. Chief Justice Burger, in his classic case of Office of Communications versus the Federal Communications System, I believe in 425 Fed 2d, the Staff has to pick up some of the burden here and get the data and see if the position is feasible or useful or likely to develop facts.

I know that throws a big burden on the Regulatory Staff or the Regulatory Commission, but at least that is what

3 mm: this decision by the now Mr. Chief Justice Burger said they
2 should do.

3 And it isn't just an idle suggestion by the Hudson
4 River Fishermen's Association here that they have dreamed
5 up some fantasy. It appears to have possibilities of real
6 practicality.

7 Maybe the costs are higher than they should be. I
8 don't know. But for a lot of the details of the cost-benefit
9 analysis, I think the burden is on the Regulatory Staff of the
10 Commission to come up and say either there is nothing to it, or
11 yes, there is, but this is the way we compute it to be.

12 I think the Intervenors can't just dream up a
13 fantasy. They have to come forward with something that
14 reflects a study, too, as well as they can and with the data
15 reasonably available to them.

16 But you could go through a cost-benefit analysis on
17 a partial operation, and it seems to me you would never
18 end.

19 Supposing it appeared that the plant had to put --
20 its whole system had to peak at 5 o'clock on December 21, and
21 the fish, as I understand it at that time, the impingement
22 situation would be in high gear. You can't run out and count
23 the number of fish that are there, and if you start it up, see
24 how many are impinged, you could get variations to the point
25 where I think IBM would be confounded with that kind of program.

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1 So, I think you have to balance what looks like a
2 fairly reasonable suggestion by the Intervenor, and the
3 Staff can come in and give the benefit of their expertise in the
4 field. They have more expertise in the field, perhaps, than
5 the Applicant, because the Regulatory Staff is working on
6 Environmental Statements by the dozen for these plants, and
7 maybe they can readily come to some conclusion about these
8 things.

9 I think it has to be done in a general way, but I
10 don't know how far you can carry it. You would never get done.

11 MR. TROSTEN: I agree, there is a practical limit
12 to which you can carry these things.

13 Another general point I would like to make
14 is, I think before you reach that you have to make the initial
15 decision, the Board has to make the initial decision as to what
16 the projected impact of the plant is going to be before you
17 reach the secondary decision.

18 That is just a general observation.

19 MR. BRIGGS: It seems to me the Staff has made an
20 analysis of what they think the impact will be, and have
21 made certain recommendations and we have asked them, did they
22 consider this partial operation of the plant, and as I under-
23 stood it, there was some indication that maybe it was
24 considered, but wasn't considered very much.

25 So we asked them to look at it and see how they

mm5 1 would balance out the costs and benefits.

2 MR. TROSTEN: Mr. Chairman, I gather we are concluded
3 with this particular point --

4 CHAIRMAN JENSCH: We would indicate to the Applicant,
5 however, that the Board believes that the Applicant should
6 respond to the request in whatever form it desires.

7 But it is a means to save hearing time and that is
8 what we are trying to do.

9 MR. TROSTEN: Yes. We are fully in accord with trying
10 to save time.

11 Mr. Chairman, can we turn to the matter of ruling
12 on the motion to, my motion to strike the two pieces, the two
13 statements by Dr. Goodyear.

14 In this connection, I would like to remark that I
15 don't know the theory on which Mr. Macbeth is proceeding in
16 stating that Applicant has opened the door somehow.

17 Applicant never asked Dr. Goodyear a question having
18 to do with this particular subject.

19 CHAIRMAN JENSCH: We would like to have a further
20 presentation from the parties with specific transcript
21 references about this matter.

22 MR. MACBETH: Would you like that at this time?

23 CHAIRMAN JENSCH: If you can, we will take yours.

24 MR. MACBETH: There was a discussion with Mr. Clark
25 beginning on page 8683 of the transcript, in which questions

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1 were asked about percentages that would be withdrawn by Storm
2 King, and you can only start to answer that if you have, if
3 you got into this question of the percentages which the
4 Applicant will withdraw.

5 Generally I would say too that there has been a
6 great deal of discussion back and forth with the Applicant's
7 witnesses, Dr. Raney in particular, as to reliance on the
8 Carlson-McCann report and by Dr. Lawler as well, as to
9 whether or not, or which parts of that report have been taken
10 and so on.

11 What I was driving at is whether or not Dr. Goodyear
12 relied on the conclusions. And if he did not rely on the
13 conclusions, why?

14 That was, I think -- I think it is appropriate
15 for the full record, so that we understand the relationship of
16 the testimony of all of the witnesses to the Carlson-McCann
17 report, and that this rather simple exchange be included in
18 the record.

19 I don't see any grounds for striking this. I am
20 not going to raise major --

21 CHAIRMAN JENSCH: The Board will defer ruling on it.
22 We will be glad to have a further submittal from the
23 parties, if they desire to.

24 MR. TROSTEN: First of all, Mr. Chairman, it is
25 not apparent to me the reason why the Intervenors desire to

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1 induce or to elicit a conclusion from Dr. Goodyear as to the
2 validity of the conclusions drawn by the Carlson-McCann report.
3 For some reason they appear to want to do that. It is
4 perfectly clear from the transcript references that Mr. Macbeth
5 cited, pages 8683 through 8686 and beyond, that I said on 8686
6 when Mr. Clark attempted to get into the subject, when he
7 tried to do it:

8 "As I was afraid you must have misunderstood
9 my question. I wasn't asking you whether Carlson and
10 McCann were correct in estimating the number of eggs
11 removed by the Cornwall plant. I realize you disagree
12 with Carlson and McCann's conclusion" --

13 and so on. Mr. Macbeth has just correctly stated it. The
14 basis for this motion should be whether or not Dr. Goodyear is
15 relying on this. This is certainly an important basis.

16 He has said he does not rely upon it, and
17 hence the question and the answer are entirely improper and
18 the motion to strike should be granted.

19 CHAIRMAN JENSCH: We would like the transcript
20 reference for the statement by Dr. Goodyear, either at this
21 session or the prior session as to the extent on which he
22 did rely on the Carlson-McCann report.

23 We have a recollection that he said he relied on
24 some of the data. I think by that statement he excluded the
25 conclusions.

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1 We would be glad to have a further presentation
2 and we want to review the transcript on this.

3 MR. TROSTEN: Yes, sir.

4 The Chairman asked at the last session of the
5 hearing whether I wished to offer in evidence the correspon-
6 dence from the Hudson River Policy Committee to Mr. Woodbury
7 and I asked if we could defer consideration of that.

8 I would like to offer the correspondence in
9 evidence as explained by Mr. Woodbury, and the document is
10 dated January 11 --

11 CHAIRMAN JENSCH: Is there objection by the
12 parties?

13 MR. MACBETH: Just a question of clarification.

14 There is one page in this correspondence which has
15 no title or indication of where it comes from. It directly
16 follows a letter from . G. Hull to Harry G. Woodbury of May
17 24, 1972, and then there is a page with a discussion of the
18 Policy Committee's role. But there is no indication of
19 where this page came from.

20 I would just like to have that identified before
21 the document goes into evidence.

22 MR. TROSTEN: It is identified in one of the pieces
23 of correspondence, Mr. Macbeth. I will find it in a moment.

24 Mr. Macbeth, will you accept for the moment -- I
25 will doublecheck it later -- that the page is indeed identified

mm91 in one of these letters here and I will confer with you later.

2 CHAIRMAN JENSCH: If you can't identify it for the
3 record now, you may do it in March.

4 Is there any objection by the parties to
5 incorporating this statement?

6 MR. KARMAN: We have no objection.

7 CHAIRMAN JENSCH: The request is granted and the
8 correspondence may be physically incorporated in the
9 transcript as if orally presented.

10 MR. TROSTEN: And received in evidence.

11 CHAIRMAN JENSCH: And received in evidence.

12 (The correspondence follows.)

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New York State Department of Environmental Conservation

Albany, N. Y. 12201

Henry L. Diamond,
Commissioner

January 11, 1973

Mr. Harry G. Woodbury
Executive Vice President
Office of Environmental Affairs
Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, N.Y. 10003

Dear Mr. Woodbury:

This is in reply to your request for a description of the activities of the Hudson River Policy Committee, particularly with reference to Indian Point.

It is my understanding that Con Edison was required by the Federal Power Commission to conduct studies concerning the effect of the proposed Cornwall Pumped Storage Power Plant on the Fisheries of the Hudson River. Consolidated Edison required help in knowing how to proceed and contacted New York State Conservation Commissioner Wilm for advice. Accordingly, in 1965 Commissioner Wilm suggested a Committee consisting of representatives of the New York Department of Conservation, U. S. Bureau of Sport Fisheries and Wildlife and Consolidated Edison be formed to design and supervise a study to satisfy FPC requirements. The membership was changed in 1966 removing Consolidated Edison as a voting member and adding the New Jersey Division of Fish and Game to the Committee. Consolidated Edison remained as an observer. A Technical Subcommittee was created with the same three agencies represented. New York's Director of Fish and Wildlife served as Chairman of the Policy Committee and a representative of the U. S. Bureau of Sport Fisheries and Wildlife served as Chairman of the Technical Subcommittee.

During the following year additional members
(Connecticut Board of Fisheries & Game and U. S.

Mr. Harry G. Woodbury

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Bureau of Commercial Fisheries) were added to the Committee. Although requests for membership from various lay groups have been made, the Committee has consistently refused such requests.

The Hudson River Policy Committee has always been an ad-hoc inter-agency group with a common interest in the Hudson River's natural resources. Committee members each represent a government agency but the Committee itself is not a regulatory arm of any agency. Therefore, its role is to advise the company and monitor the field studies. This service, hopefully, demonstrates that the various agencies represented consider these studies valuable in a continuous effort to manage or protect the resource. Therefore, by this support, credibility is provided to the data. The Hudson River Policy Committee is not a "Con Edison Committee" as can be construed by its long association with their studies. Any company along the Hudson can submit proposals for review and have its studies monitored. To date, only Con Edison has taken advantage of this service.

The original purpose of the Policy Committee was to design and provide technical direction to a study to determine the impact of the proposed Storm King Pump Storage Project on the Hudson River fishery. Northeastern Biologists was recommended by the Committee and became the study contractor under contract to Con Edison.

During the early phase of the field studies it became apparent that closer supervision was required. Con Edison agreed to reimburse the Policy Committee for the salary and expenses of a full-time technical

Mr. Harry G. Woodbury

Page - 3 -

advisor. The Bureau of Sport Fisheries and Wildlife accepted responsibility for this position and appointed Mr. Frank Carlson as Technical Advisor. The Bureau of Sport Fisheries and Wildlife also appointed Dr. James McCann of the University of Massachusetts as part-time statistical advisor. It later became necessary for these two individuals to assume management of the project and write the report which is known as the "Carlson-McCann Report". That is the only Committee publication and it should be pointed out that the Committee was created to conduct studies and write the report only for the Cornwall Study.

When Consolidated Edison had to be concerned with construction and operating permits for Indian Point Units they asked the Policy Committee to continue to advise. The Committee agreed to do this but indicated direct supervision would not be provided nor would they accept responsibility to write reports. They would simply review and advise as to quality and importance to providing information on fisheries impact. They also agreed to interview and recommend potential contractors.

Data analysis and conclusions, therefore, are the responsibility of the scientific contractor for Con Edison. The Committee reserves the right to make an independent analysis and arrive at its own conclusions. A similar review can be made by any scientific group. Therefore, the Committee feels that its most important role is to provide validity and objectivity to the data by having an on-site representative. This position is now more appropriately called Committee Coordinator (formerly Technical Advisor). He serves as staff to the Policy Committee and Technical Subcommittee and as

Mr. Harry G. Woodbury

Page - 4 -

a communication link with Con Edison. Mr. Gordon Beckett is presently the Coordinator and has been for two years. Mr. Beckett has a Master of Science degree from Oklahoma State University and has been a fishery biologist with the Bureau of Sport Fisheries and Wildlife for 11 years. He does have the personal field experience to monitor the Hudson River Ecological studies. His principal duties are to keep abreast of field studies, monitor field sampling techniques and generally maintain a personal confidence that the ecological investigations are conducted on the highest scientific level. From a practical standpoint the Coordinator has a small office at Con Edison's Environmental Center and is in daily contact with the persons conducting the study. He has no contractual authority over the contractors but frequently makes direct recommendations concerning the conduct of the study.

With respect to the first Indian Point study, the Policy Committee did recommend to Con Edison Raytheon Corporation as the study contractor and provided guidance of its operations for two years. The final publication was solely the responsibility of the Raytheon Corporation.

The plan of study, which is now underway by Texas Instruments and New York University, was submitted by Con Edison to the Policy Committee for its review and approval. The Policy Committee recommended modifications to it and approved it as modified. Battelle Northwest and Texas Instruments were recommended by the Policy Committee as the two Companies best qualified to conduct the study from approximately 40 firms screened. New York University was already conducting a part of the study and they were retained. Con Edison selected Texas Instruments from the two recommended companies.

Mr. Harry G. Woodbury

Page - 5 -

The Policy Committee meets at the call of the Chairman to consider special problems or evaluate a recommendation of the Technical Subcommittee. During 1971-2 the Policy Committee met on Sept. 9, 1971, Nov. 9, 1971 and July 11, 1972.

The Technical Subcommittee has always functioned as the working arm of the Policy Committee. The Technical Subcommittee now meets monthly. At these meetings, most of a day is devoted to a detail review of one small section of the ecological studies. The biologist in charge presents the findings to date and preliminary analysis. This format allows the Committee members to relate directly with the field staff. Biologists from Texas Instruments, New York University, Quirk, Lawler and Matusky, Boyce Thompson Institute and Con Edison attend these meetings as non-voting participants.

The Policy Committee and Technical Subcommittee records minutes of their meetings, which are sent to each member and Con Edison. There is no attempt to keep these minutes secret but they are not issued as public documents. Original copies are kept by the Coordinator at the study site.

Policy Committee meetings are usually held in the Department of Environmental Conservation building in Albany. Technical Subcommittee meetings are held at the Environmental Research Laboratory in Verplanck or at the regional office of the Department of Environmental Conservation in New Paltz. These meetings are not public meetings, but the Committee would not exclude any interested person who wished to observe the meeting. There are no announcements of the meeting

Mr. Harry G. Woodbury

Page - 6 -

dates or places. The reason is that meetings are to keep the members informed of study progress, as work sessions to review proposals or to formulate recommendations. These are not regulatory type meetings and public funds are not being spent in conducting the studies.

Neither the Policy Committee nor the Technical Subcommittee maintains an office other than the Coordinator's office. Correspondence can be sent to Mr. Gordon Beckett, Post Office Box J, Cornwall, N.Y. 12518. His telephone number is 914/737-3081.

Attached is a current list of members of the Policy Committee and Technical Subcommittee.

Sincerely yours,



A. G. Hall, Chairman
Hudson River Policy Committee

Enc.

cc: Griffith
Norris
Jensen
Cookingham
Beckett

12/19/72

POLICY COMMITTEE MEMBERS

- (1) Mr. Albert G. Hall
Director of Fish and Wildlife
New York Environmental Conservation Department
50 Wolf Road
Albany, New York 12201

- (2) Mr. Richard E. Griffith
Regional Director
Bureau of Sport Fisheries and Wildlife
U.S. Post Office and Courthouse
Boston, Mass. 02109

- (3) Mr. Russell T. Norris
Regional Director
National Marine Fishery Services
Federal Building
15 Elm Street
Gloucester, Mass. 01930

- (4) Mr. Russell Cookingham
Director of Fish and Game Division
Labor and Industry Bldg.
Box 1390
Trenton, New Jersey 08625

- (5) Mr. Al Jensen
Director
Dept. of Environmental Conservation
New York University
Stony Brook, Long Island, N.Y.

12/19/72

TECHNICAL COMMITTEE MEMBERS

- (1) Lee Mills
Assistant Regional Supervisor
Bureau of Sport Fisheries and Wildlife
U. S. Post Office and Courthouse
Boston, Mass. 02109

- (2) Mr. Ken Wich
Assistant Director
New York Environmental Conservation Department
50 Wolf Road
Albany, New York 12201

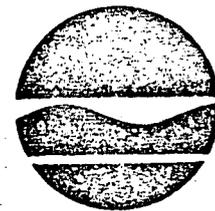
- (3) Mr. Warren H. McKeon
Regional Director
New York Environmental Conservation Department
21 South Putt Corners Road
New Paltz, New York 12561

- (4) Chester Zawacki
Assistant Director
Division of Marine and Coastal Resources
New York Environmental Conservation Department
Marine Region 4175
Veteran Memorial Highway
Ronkonkoma, Long Island, New York 11779

- (5) Mr. Marvin Boussu
National Marine Fishery Service
Federal Building
14th Elm Street
Gloucster, Mass. 01930

- (6) Mr. Gordon Beckett
Texas Instruments, Inc.
P.O. Box 237
Buchanan, New York 10511

- (7) Mr. Paul Hamer
Principal Fishery Biologist
Bureau of Marine and Fisheries Lab.
Nacote Creek Lab.
Star Rt.
Absecon, New Jersey 08201



New York State Department of Environmental Conservation

Albany, N. Y. 12201

Henry L. Diamond
Commissioner

July 20, 1972

Mr. Harry G. Woodbury *HGW 7/24*
Executive Vice President
Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, N. Y. 10003

Dear Mr. Woodbury:

This is in response to your letter of June 13 concerning the relationship between Consolidated Edison Company and the Hudson River Policy Committee with regard to the present Hudson River ecological studies being carried on by the Company relative to Indian Point Unit 2.

This will advise you that the committee met July 11 in Albany to discuss this relationship. The committee agreed that it should serve as a steering group providing technical review. It will be advised by an on-site Coordinator and a Technical Subcommittee. Recommendation for any changes in the direction of study and comments on progress reports will be sent directly to the Company for their consideration and possible implementation. The Coordinator, as representative of the committee can make suggestions on site to the contract administrator.

The above relationship will hold for the proposed Cornwall studies, the review of which will be made by the Technical Committee July 25.

The committees appreciate the spirit of cooperation that exists between the Company and the committees and looks forward to continued close relationships as additional studies may be carried out.

Sincerely,

A. G. Hall
A. G. Hall, Director
Division of Fish and Wildlife

Harry G. Woodbury
Executive Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003
Telephone (212) 460-6001

June 13, 1972

Mr Albert G Hall
Director of Fish and Wildlife
Environmental Conservation Department
50 Wolf Road
Albany, New York 12201

Dear Al

In your letter of May 24, 1972 you indicated that "Texas Instruments is not responsible to us but to Con. Ed and, rightly so, for you have the contract. The Policy Committee with advice from Gordon Beckett can recommend operational changes. He cannot nor can we order Texas Instruments or Con. Ed's biologists to change procedures". The Department of Commerce in commenting to the AEC on the "Draft Detailed Statement" made a similar observation. See attached extract. We responded to the AEC request for comments on the Department of Commerce observations by letter dated June 9, 1972, copy attached.

The relationship between this Company and the Hudson River Policy Committee with respect to the "Cornwall" project which is outlined in a letter dated August 24, 1966 from Mr John S. Gottschalk of the U.S. Department of the Interior to Commissioner Robert A Roe, New Jersey Department of Conservation, has been most satisfactory to us. The responsibilities and authorities borne by the Hudson River Policy Committee have indeed been substantial and the execution of these under your leadership has been well received by regulatory and judicial agencies of government. We are deeply grateful for your cooperation and assistance. It is our hope and understanding that these relationships, responsibilities and authorities will continue until the operating studies directed by the licensing agency have been completed.

Three years ago we sought to extend the Cornwall relationships to biological studies and reports at Indian Point. Raytheon was selected by the Policy Committee to initiate the first phase of an ecological study at Indian Point. Because of the quality of their performance and because of changing needs brought about by changing criteria and public interests, it was agreed that other contractors should be obtained to carry on the work with a substantially enlarged scope of work. New York University Department of Environmental Health and Texas Instruments, with the concurrence of the Hudson River Policy Committee, have since been retained to accomplish this work over the next five years.

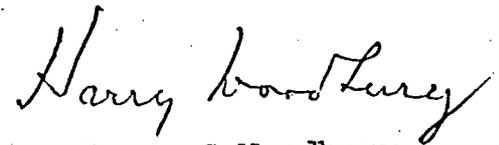
June 13, 1972

I understand that because of problems of contract management and administration and manpower limitations, the Policy Committee would prefer, with respect to the Indian Point Studies, to assume the role of a Study Steering Committee. It is my understanding that the Steering Committee would review the scope of the work and its execution and, where necessary or desirable, submit recommendations for changes to this Company. The Company, as contract administrator, would order the changes to be made. The Steering Committee would also review, comment upon and make recommendations concerning periodic progress reports and preliminary and final findings and recommendations. The Committee will maintain, at no expense to the Committee, a full time representative on site whose authority to act for the Committee will be determined by the Committee. The current relationship between our respective on site representatives is eminently satisfactory and we would hope this working relationship can continue.

Through this relationship, it is my understanding that it is our respective intent to study and mutually determine the impact of Indian Point Power Plant operations on the aquatic biosystem of the Hudson River and that together we would support the findings and conclusions as necessary and appropriate in any regulatory proceeding.

Such an understanding and arrangement is wholly satisfactory to Con Edison and we are deeply grateful for the assistance of the Committee in these important undertakings on the Hudson.

Sincerely yours,



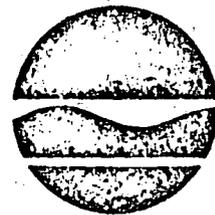
Harry G Woodbury

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CC to Members Hudson River Policy Committee

William E Caldwell
Warren B Coburn
Carl L Newman
Joseph A Marubbio
George T Cowherd
Raj Sharma
Reading File

Carl Mc Hall,



New York State Department of Environmental Conservation

Albany, N. Y. 12201

Henry L. Diamond
Commissioner

May 24, 1972

HW 5/30
Mr. Harry G. Woodbury
Executive Vice President
Consolidated Edison Company of
New York, Inc.
4 Irving Place
New York, N. Y. 10003

Dear Mr. Woodbury:

On several occasions and in some reports such as the recent AEC Statement on Environmental Considerations related to licensing of Indian Point Unit No. 2, it has been stated that the ecological studies related thereto "are directed by the Hudson River Technical and Policy Committees." This is misleading for our responsibility is more that of a watcher or advisor rather than a commander or director. The report on Page I-9 would indicate that the Biological studies carried out by nine different organizations were under our direction. This, of course, is not fact.

Texas Instruments is not responsible to us but to Con. Ed and, rightly so, for you have the contract. The Policy Committee with advice from Gordon Beckett can recommend operational changes. He cannot nor can we order Texas Instruments or Con. Ed's biologists to change procedures. In a similar vein the present studies include some work not recommended by us. Therefore, if we actually designed the studies they would be different. We just advised and recommended. Any approval by the committees does not have to be accepted by Con. Ed.

I point this out because I know committee members are concerned that the Committees be properly related to the studies so as to prevent any misunderstanding as to our responsibilities and place. Encon's comments as well as comments from other agencies on the AEC report will cover this.

Sincerely,

A.G.H.
A. G. Hall, Director
Division of Fish and Wildlife

The first paragraph on Page V-57 again states that ecological studies are directed by the Hudson River Policy and Technical Committees. Additionally, it is stated that the "Committees outline and supervise the studies . . ." The committees do not outline the studies; although as mentioned previously, their opinions and suggestions may be solicited by the applicant. Use of the verb "supervise" denotes a direct association and degree of guidance that does not accurately reflect the actual situation. The true situation should be described.

The first paragraph on Page V-59 states that "These studies will be directed by the Hudson River Policy and Technical Committees . . ." Again, this does not reflect the factual situation.

A more adequate reference to the Technical and Policy Committees than employed elsewhere in the statement appears in the first paragraph on Page VIII-5, where it is noted that "The applicant uses the advice of the Hudson River Policy and Technical Committees . . . to plan for fish protection and for types of environmental monitoring programs . . ."

In the second paragraph on Page XI-26, it is said that ". . . the company has asked the Hudson River Policy and Technical Committee to conduct a ten-million dollar 5-year study . . ." So far as we are aware, the Policy Committee will not be conducting any studies on the Hudson River. On this same page (last paragraph) we note that an expression of opinion by a Dr Gerald Lauer is attributed to the many aquatic biologists that have been consulted by the company. If this opinion is endorsed by all those to whom it is, at least by implication, attributed, it should be so stated.



STATE OF NEW YORK
CONSERVATION DEPARTMENT
ALBANY

HAROLD G. WILM
COMMISSIONER

February 19, 1965

Mr. C. E. Eble
President
Consolidated Edison Company
4 Irving Place
New York, New York

Dear Mr. Eble:

You will recall that our Water Resources Commission statement, presented before the Federal Power Commission in 1964, expressed real concern about possible losses of eggs and young of valuable fish species at your proposed Storm King project. We requested the Power Commission to require all practical steps be taken to prevent this potential damage.

Meetings with members of our staff, representatives of your Company and the Bureau of Sport Fisheries and Wildlife of the U. S. Fish and Wildlife Service were held January 27 at Poughkeepsie and February 5 at New York City for the purpose of reviewing status of our present knowledge concerning possible impact and need for additional information.

We have considered the type and scope of investigations believed necessary to answer questions raised about the effects of the project operations on eggs and young fish. As a result of these joint deliberations it is our recommendation that a three year study be initiated this spring, with financing by your Company.

The attached project statement outlines the purposes and scope of the study, and projects the anticipated costs for the first year. The overall costs should be less in the following years since no major capital purchases would be involved for the study. We would anticipate the establishment of a Policy Committee composed of representatives of your company, the Fish and Wildlife Service

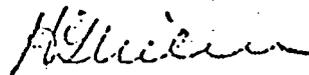
C. E. Eble

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and this Department. Specific supervision and direction of the studies would be supplied by our personnel at no cost to Consolidated Edison. A comprehensive report would be supplied to you at the end of the three year period, although progress reports would be submitted regularly to the Policy Committee during the course of the study.

A prompt decision is essential, if the research work is to be started early enough this spring to check on spawning, eggs and young fish. We would be happy to review any part of the proposed program with you, should further clarification be necessary to assist in your decision.

Sincerely yours,



Commissioner



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

59 TEMPLE PLACE
BOSTON, MASSACHUSETTS 02111

March 4, 1965

Mr. C. E. Eble
President
Consolidated Edison Company
4 Irving Place
New York, New York

Dear Mr. Eble:

The Bureau of Sport Fisheries and Wildlife has been furnished with a copy of New York Conservation Commission Harold Wilm's letter to you of February 19, 1965 concerning the Storm King pumped-power project.

Under the provisions of the Fish and Wildlife Coordination Act and the Federal Water Power Act, this Bureau shares with the states a coequal responsibility in assuring the conservation of fish and wildlife affected by water development projects.

This letter is written to endorse the proposal made by Commissioner Wilm and to affirm our willingness to participate as a member of the policy committee which is suggested by Mr. Wilm.

It is our considered opinion that it will be impossible to design a suitable intake screen, satisfactory to all parties having an interest in this matter, without studies such as have been outlined.

We join with the State of New York in urging the Consolidated Edison Company to provide financial support for this research and hope that this can be arranged in time to permit the inauguration of these studies this spring.

Anticipating that the Company response will be favorable, we suggest an early convening of the suggested policy committee to work out the details of getting the project under way. Mr. Thomas Schrader will be the representative for this Bureau.

Sincerely yours,

Richard E. Griffith
Richard E. Griffith
Regional Director

March 16, 1965

Honorable Harold G. Wilm
Commissioner
Conservation Department of the
State of New York
Albany, New York

Dear Mr. Commissioner:

We have carefully considered the study of Hudson River fish life proposed in your letter of February 19, and endorsed by Mr. R. E. Griffith, Regional Director of the Bureau of Sport Fisheries and Wildlife of the United States Fish and Wildlife Service, and we agree to pay the cost thereof.

In its March 9, 1965 order issuing a license to the Company to construct and operate the Cornwall Project, the Federal Power Commission found that, "The project will not adversely affect the fish resources of the Hudson River provided adequate protective facilities are installed. It appears that the facilities now planned for inclusion are adequate. However, opportunity should be made available at the reopened proceeding for interested persons and agencies to introduce such additional evidence as they may desire on the design of the fish protective facilities." (Finding No. 24, p. 44). Further hearings will commence on May 4, 1965.

Article 37 of the license sets forth the Commission's specific requirements with respect to fish protection. It requires the Company, after consultation with your Department and with the Fish and Wildlife Service, to install a fish-screening facility, to finance "post-construction evaluation studies", and to make any needed modification of the screening facility ordered by the Commission on its own motion or upon recommendations by your Department and the Fish and Wildlife Service.

Honorable Harold G. Wilm

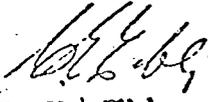
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March 16, 1965

Any action taken by the Company must, of course, be consistent with, and subject to, the terms of the license tendered by the Federal Power Commission, which we propose to accept. Our cooperation with your Department and the Fish and Wildlife Service, which is consistent with the findings of the Commission and terms of the license, should not be construed as indicative of any change in the Company's position that the project will not adversely affect fish life and that the Commission should presently authorize installation of the type of screening device proposed by the Company.

You may be assured of our continued cooperation.

Sincerely yours,


C. E. Eble
President

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CHAIRMAN JENSCH: Is there any further matter to
be presented in this hearing?

(No response.)

At this time let us recess to reconvene at 9 a.m.
on March 5, 1973 in the auditorium in Germantown, Maryland.

(Whereupon, at 11:40 a.m., the hearing in the
above entitled matter was adjourned, to resume at 9:00 a.m.,
5 March 1973, in the auditorium in Germantown, Maryland.)

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