

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
)
CONSOLIDATED EDISON COMPANY) Docket 50-286
OF NEW YORK, INC.)
)
(Indian Point Nuclear Generating Unit 3))

MEMORANDUM OF HUDSON RIVER
FISHERMEN'S ASSOCIATION AND
SAVE OUR STRIPERS IN RESPONSE
TO INQUIRIES BY THE ATOMIC SAFETY
AND LICENSING BOARD

At the special prehearing conference held in this proceeding on February 6, 1975, the Atomic Safety and Licensing Board put a number of questions to the parties with respect to matters that were of concern to the Board. The Hudson River Fishermen's Association ("HRFA") and Save Our Stripers ("SOS") submit this memorandum in response to the Board's inquiries.

1. Relationship of EPA Proceedings to Indian Point 3.

Con Edison has responded to the Board on this point by describing the litigation which is pending in the Fourth Circuit Court of Appeals, Appalachian Power Company v. Train, Dkt. No. 74-2096, in which a large number of utility companies

across the country have challenged two major sets of regulations which the Environmental Protection Agency promulgated last year. 39 Fed. Reg. 36175, 36185 (Oct. 8, 1974). One set of regulations establishes final effluent limitations and guidelines and standards of performance and pretreatment standards for steam electric power plants pursuant to sections 301, 304(b) and (c), 306(b) and (c) and 307(c) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §§1311, 1314(b) and (c), 1316(b) and (c) and 1317(c). With certain exceptions, these regulations require that steam electric power plants with a capacity of 500 MW or more which were placed in operation after January 1, 1970 must be equipped with closed-cycle cooling systems by July 1, 1981. 39 Fed. Reg. 36185 (Oct. 8, 1974).

The second set of regulations is promulgated under section 316(a) of the 1972 Act, 33 U.S.C. §1326(a), and prescribe the procedures by which the owner or operator of a thermal discharge may obtain from EPA a variance allowing a greater discharge of heat than that allowed under the standards of sections 301 and 306 of the Act upon a showing that the increased discharge of heat will still assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in the receiving water body. 39 Fed. Reg. 36175 (Oct. 8, 1974).

It is our understanding that while the petition to review and motions to transfer have been filed in the

Appalachian Power case, the detailed and substantive briefs of the parties have not been filed and thus nothing but the broadest outlines of the controversy are presently known.

With reference to EPA, two other matters should be placed before the Board so that the record reflects the present state of the facts. First, EPA has published proposed but not final regulations under section 316(b) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §1326(b), 38 Fed. Reg. 34409 (Dec. 13, 1973). Section 316(b) is the section of the Act which is most directly related to the problems of entrainment and impingement at steam electric power plants. The section states:

"Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. §1326(b).

When final regulations are promulgated under this section, there may be further challenges to EPA's regulations by interested parties.

Second, on February 25, 1975 EPA Region II issued permits under section 402 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §1342, for five power plants along the Hudson River: Bowline, Lovett, Indian Point 1 and 2, Danskammer and Roseton. These permits

require that closed-cycle cooling be installed at Indian Point 2 by May 1, 1979, and at Bowline and Roseton by July 1, 1981, and that a reduction of fish impingement be achieved at Indian Point 1 and Danskammer. As of the beginning of March, no final permit had been issued for Indian Point 3. Interested parties may request adjudicatory hearings in which to contest the conditions of these permits. The period in which such requests may be made has been extended and has not yet expired. To our knowledge, no request for an adjudicatory hearing on any of these permits had been made as of March 20, 1975.

2. Schedules for the Construction of the Indian Point 2 and 3 Cooling Towers.

During settlement negotiations counsel for HRFA and SOS discussed the possible schedules for the construction of closed-cycle cooling systems at Indian Point at length with the attorneys for Con Edison. The Intervenors are satisfied that the schedule presented in the stipulation is realistic and a reasonable compromise of the interests of all the parties involved. Con Edison clearly agrees that the schedule can be met and has set out the various elements of the schedule at length in its "Memorandum in Response to Inquiries by the Atomic Safety and Licensing Board." The Intervenors see no need to add to that discussion.

3. Cost of Cooling Towers

HRFA and SOS have not undertaken an extensive independent analysis of the cost of cooling towers. The figures presented by Con Edison ("Economic and Environmental Impacts of Alternative Closed-Cycle Cooling Systems for Indian Point Unit No. 2," Section 5) and the Staff (1 IP3 FES XI-65 and following) are in the same general range. With figures of the range reported, HRFA and SOS agree with the Staff that under the National Environmental Policy Act the benefits of closed-cycle cooling outweigh the costs and that closed-cycle cooling should be required at the Indian Point 3 plant.

Two comments on the presentation of the other parties are in order. First, Con Edison continues to include tax transfer payments in its costs. "Economic and Environmental Impacts" at 5-16. These amounts should not be allowed and appropriate reductions should be made in the Con Edison cost figures.

Second, the Staff has made a commendable effort to estimate the value of the Hudson fishery, nevertheless, there are weaknesses in this analysis which the Staff has recognized and which must be underscored. There are many species of aquatic biota which may well be damaged by the operation of Indian Point 3 with once-through cooling, but for which the damage cannot be quantified. The cost of this damage must be recognized and weighed in any

cost-benefit analysis. There are intangible values in the entire fishery which cannot be effectively quantified. The environmentally protective mandate of section 101 of the National Environmental Policy Act recognizes these values and they must be heavily weighed in the cost-benefit analysis under that Act. The cost per angler day of \$12.99 is low and must be thoroughly reevaluated. The Staff indicates that a cost of \$59.80 may be more appropriate. 1 IP3 FES at XI-104. The difference between these two figures shows how important careful consideration of these figures is. The present method of comparing costs and benefits improperly exaggerates the costs of present capital investments in relation to the value received annually from the fishery. 1 IP3 FES at XI-101 and following. This must be rectified by comparing total costs and benefits over the long run and by recognizing the premium which protein is likely to command 30-50 years from now in an increasingly food-short world.

4. Environmental Impacts of Cooling Tower Operation.

The Staff and Con Edison have conducted further research on the environmental impacts of cooling tower operation from fogging, saline drift and noise. The results of that research largely confirm the position, taken by HRFA and its expert in the Indian Point 2 proceeding, that with a natural draft closed-cycle cooling system there would be

insignificant damage from fogging, saline drift or noise.

The Staff estimates that natural draft closed-cycle cooling towers on Indian Point Units 2 and 3 would produce less than 4 hr/yr of additional fogging in the center of Peekskill. 1 IP3 FES XI-27. Con Edison came to essentially the same conclusion: "[N]o significant ground level visibility hazard is expected to occur by the operation of a natural draft cooling tower." "Economic and Environmental Impacts" at 6-12 et seq.

The Staff concluded that there would be negligible damage to vegetation from salt drift. 1 IP3 FES XI-21 et seq. Con Edison's research reached the same conclusion, showing only potential injury to three species in a small area (1 Km²) and potential injury to hemlocks in a slightly larger area (3.5Km²) after 14 rainless days coinciding with low fresh water flows in the Hudson.* "Economic and Environmental Impacts" at 6-14 et seq.

The Staff concludes that noise will not be an insignificant problem with natural draft cooling towers, pointing out that traffic noise along Broadway at the property line exceeds the level of noise expected from the towers more

* Con Edison also examines the case of 30 consecutive rainless days but this seems a truly unrealistic event, since the longest rainless period the company could find recorded in the area was 27 rainless days in 1897. "Economic and Environmental Impacts" at 6-24.

than 50% of the time. 1 IP3 FES XI-20. Con Edison reaches basically the same conclusion. "Economic and Environmental Impacts" at 6-48 et seq.

The Staff and Con Edison assume that there will be a major aesthetic impact from the natural draft towers. HRFA and SOS are submitting testimony to the Licensing Board indicating that the aesthetic impact of natural draft towers may well have been badly exaggerated.

Mechanical draft towers would be less visible but would have a greater impact through fogging, saline drift and noise.

HRFA and SOS maintain the position that the environmental impacts of closed-cycle cooling systems are vastly outweighed by the environmental impacts of once-through cooling, and that the research conducted by the Staff and Con Edison over the two and a half years since testimony on the issue was offered in the Indian Point 2 proceeding confirms the position taken by HRFA in that proceeding. Among the closed-cycle systems, natural draft towers minimize the effects of fogging, saline drift and noise, but are more visible than mechanical draft towers. Natural draft towers therefore appear to be the better system, but if the NRC, the company or the community prefer the mechanical draft towers such a system would not meet with objection from HRFA or SOS so long as the schedule for the installation and operation of the system is in no way delayed.

5. Impact of the Operation of Indian Point Units 2 and 3 on the Atlantic coastal fishery.

The issue of the relation of Hudson-spawned striped bass to the Atlantic coastal stock was of major concern in the Indian Point 2 proceeding. Research since that time has indicated the range of mature Hudson-spawning stripers, but little additional data on the percentage contribution of the Hudson to the Atlantic stock has been developed. Since there appears to have been some confusion as to what the literature on this subject shows and the experience of the witnesses with tagging, it seems worthwhile to set out HRFA and SOS's position in a succinct manner, recognizing that HRFA relied in the Indian Point 2 proceeding on testimony developed both by its own witness and by the Staff witness. It should be noted that the Staff position has now shifted and that the full analysis of the position presently taken by the Staff must await cross-examination and review of the evidence relied on.

In the Indian Point 2 proceeding, the Staff took the position that approximately 80% of the striped bass fishery of the mid-Atlantic (Delaware, New Jersey and New York) is supported by the Hudson. HRFA took a similar position, including Connecticut in the coastal area analyzed. These positions were based on a number of pieces of evidence.

First, the Staff contended that young striped bass through age 2 tend to be non-migratory. This would

indicate that fish of that age found in the mid-Atlantic waters come from an adjacent estuarine spawning ground such as the Hudson or the Delaware and not a distant one such as the Chesapeake. The non-migratory nature of young striped bass was supported by reference to analyses by Vladykov and Wallace, Merriman, Mansueti, Massman and Pacheco, and Raney. 1 IP2 FES XII-31. Raney was, of course, a witness for Con Edison in that proceeding and did not dispute this proposition.

Second, in comparing the contribution of the three major estuarine areas on the East Coast, the Chesapeake, the Delaware and the Hudson, a number of points were made. The Delaware was shown to be an estuary of very low productivity, probably due to the gross pollution in the Philadelphia-Camden reach of the River. Goodyear, "Origin of Striped Bass Stock of the Middle Atlantic Coast," March 1, 1973 following Tr. 9892 , at 12. This position was supported by Clark. Clark, Redirect, February 12, 1973 at 12-15, following IP2 Tr. 9858 . Both witnesses relied on the work of investigators in the field, the most recent being Chittenden who states that "Gross pollution of the tidal freshwater area has destroyed [the Delaware's] potential as a spawning and nursery area, has resulted in the virtual extirpation of the striped bass from there and upstream waters . . ." Quoted in Goodyear on Origins at 12.

Attention was then focussed on the relative contribution of the Hudson and the Chesapeake to the mid-Atlantic. Tag and recapture studies were analyzed. The mid-Atlantic catch was shown in recent years to be more than a million pounds. Goodyear on Origins, supra, Table 2. In addition, it was contended that this stock receives a great proportion of its initial recruits as two year olds. Goodyear on Origins, supra, at 10. Analysis of tag and recapture investigations show that a small percentage, approximately 1.5%, of the recaptured fish tagged in the Chesapeake are taken outside the Bay. Goodyear on Origins, supra, at 12. Clark reached the same basic conclusion in reviewing a study he made in 1967. IP2 Tr. 8562 et seq. Goodyear compared the weight of this proportion of the Chesapeake population to the weight of the mid-Atlantic population and concluded that it could supply only 5% of the mid-Atlantic catch. Goodyear on Origins, supra, at 12. Clark compared the numbers of fish in this proportion to the numbers caught in the mid-Atlantic plus Connecticut and concluded that it could supply only 10% or less. IP2 Tr. 8562 et seq. Goodyear also pointed out that the numbers of two year olds leaving the Bay was very low but that substantial numbers of two year olds are found in the mid-Atlantic fishery. 1 IP2 FES XII-36. These analyses rested on the work of numerous investigators who reported on tagging experiments. Goodyear on Origins, supra, Table 11; IP2 Tr. 8562 et seq.

These basic facts have been accepted by other investigators who have worked directly in the field. Mansueti has stated:

In view of the consistent record of an almost insignificant percentage of tagged fish among age groups II through IV that have left Chesapeake Bay, it is probable that the contribution [to the Atlantic coastal stock] from Chesapeake Bay is relatively small except during years when large dominant year classes enter the fishery. Mansueti, "Age, Growth, and Movements of the Striped Bass, Roccus saxatilis, Taken in Size Selective Fishing Gear in Maryland" 2 Ches. Sci. 9 (1961).

Vladykov and Wallace also pointed out the low recapture rate outside the Bay: "the outside recaptures of the Chesapeake tagged fish represented only a very small number, or approximately 2.5 per cent of the total recaptures. The Connecticut tagged fish recovered from Chesapeake Bay represent even a smaller amount, less than 2.0 per cent of Merriman's total recaptures." Vladykov and Wallace, "Is the striped bass (Roccus lineatus) of Chesapeake Bay a migratory fish?" 67 Trans. Am. Fish. Soc. 67 (1938).

Con Edison's witness Raney has agreed in published papers with these basic general conclusions on proportions of Chesapeake fish leaving the Bay:

"Merriman (1941) and Vladykov and Wallace (1952) believe that most of the basic migratory stock is produced in Chesapeake Bay (at least this seems true of the

1934 and 1940 year-classes), but the migratory part of this population is relatively small, probably less than 10% at the two-year old stage." Raney, "Life History of the Striped Bass, Roccus saxatilis (Walbaum)," 14 Bull. Bingham Ocean. Coll. 5 (1952).

Goodyear further compared the growth rate of the two year olds caught in the mid-Atlantic and showed that their growth was closer to that of slower growing fish from northern waters, such as the Hudson, than to the faster growing fish from southern waters, such as the Chesapeake.

1 IP2 FES XII-36.

Clark did a further analysis of the mid-Atlantic tagging in relation to recapture in the spawning season, and this also showed very low contributions from the Chesapeake and major contributions from the Hudson. IP2 Tr. 8562 et seq.

All these pieces of evidence pointed to a major contribution to the mid-Atlantic fishery from the Hudson and minor contributions from the Chesapeake and Delaware. To test the evidence, the Staff ran two regression analyses comparing landings in the Hudson and the Chesapeake (as indices of spawning) against later landings in the mid-Atlantic. 1 IP2 FES XII-36 et seq., IP2 Tr. 9910-12. The Hudson regression analysis showed a high correlation and the Chesapeake a spurious correlation. Ibid. These analyses did not statistically demonstrate cause and effect but they were a legitimate aid in interpreting the tagging

studies. IP2 Tr. 6844-45.

In reviewing this evidence, it is important to bear in mind a number of points. First, Clark's testimony was independent of Goodyear's, he not only analyzed the spawning pattern of fish tagged in the mid-Atlantic which Goodyear had not done, but also relied on an analysis which he had made in 1967, long before Goodyear addressed himself to this problem. IP2 Tr. 8560 et seq.

Second, it must be pointed out that Goodyear's calculations of two year olds leaving Chesapeake Bay was in error, but it was a harmless error. Goodyear failed to analyze fully the paper by Nichols and Miller which shows that 5 two year olds in addition to those which he reported were recaptured outside the Bay.* Taking the five additional fish into account would increase the percentage of two year olds leaving the Bay to approximately 1% of the total Bay population. This quantity still could not account for the substantial numbers of two year olds found in the mid-Atlantic fishery.

* However, Nichols and Miller themselves show confusion on this point, stating: "Two fish tagged during the feeding season were recaptured outside the bay, 186 and 200 days after release . . . Both of these fish were 2 years old at release; they probably left the river the following spring at which time they would have been 3 years old." Nichols & Miller, "Seasonal Movements of Striped Bass, Roccus saxatilis (Walbaum), Tagged and Released in the Potomac River, Maryland, 1959-61." 8 Ches. Sci. 102, 119 (1967). If these fish were in fact 3 years old, then Goodyear has failed to account for only 3 additional fish.

Third, it should be emphasized that Con Edison did not refute the contention that the Atlantic coastal stock receives a large proportion of its initial recruits as two year olds. The rebuttal testimony offered by Lawler on this point (Appendix D to Lawler's testimony on March 30, 1973, following IP2 Tr.10,339) discusses Alperin but not Merriman and agrees that the Alperin study "showed large numbers of two year olds entering the fishery." (At D-8). No refutation of the Staff's characterization of Merriman's work was offered, nor could it be. The Staff's point on the two year old recruitment simply was not refuted.

Finally, it must be noted that the testimony developed by the Staff and HRFA did not simply rely on a literature search by biologists with no experience in the field. Clark did experimental work reported in two papers which were relied on by all the parties to the Indian Point 2 proceeding. Perhaps equally importantly, the issue involves analyzing the meaning of tag returns. To do this, a knowledge of the fish and its life cycle is necessary but actual experience with putting tags into fish in the Hudson or the Atlantic is irrelevant.

In sum, HRFA's position remains basically what it was in the Indian Point 2 proceeding taking into account the necessary correction for the Nichols and Miller paper, the further support provided by the examination of the papers

by Mansueti, Vladykov and Wallace, and Raney, and the confirmation by the research results obtained from the Texas Instruments tagging study discussed in Clark's testimony in this proceeding. An analysis has not yet been made in depth of possible differences with the present Staff position which, because of the use of zones other than those used in the Indian Point 2 proceeding, requires a full and careful examination.

6. Impingement at Indian Point 1 and 2.

Little new and useful information on the question of impingement has become available since the close of the proceedings on Indian Point 2. This data is discussed in the testimony of John R. Clark submitted in this proceeding.

7. "F" Factors.

It is apparent that in writing the Final Environmental Statement for Indian Point 3, the Staff did not have available to it the report submitted by NYU in December, 1974, "A Preliminary Analysis of the Abundance of Four Life History Stages of Striped Bass (Morone saxatilis) Collected in the Intakes of Indian Point Unit 1 and in the Hudson River in Front of Indian Point." The data on which that analysis rests have not yet been made available to HRFA and SOS despite a request for the data on February 5, 1975. Thus

full analysis of the evidence on "f" factors has not been possible. Nevertheless, the conclusions of the NYU analysis indicate that the Staff should undertake a serious reevaluation of its calculation of "f" factors. The Intervenor's position on the "f" factors is discussed and presented in the testimony of John R. Clark in this proceeding.

Throughout the Indian Point 2 proceeding it was the contention of Con Edison that the water entering the intakes at Indian Point was drawn from the upper east quadrant of the River cross-section in front of the plant. There is no indication that Con Edison has changed its position on this point. At the same time there is no indication that Con Edison has substantiated this position through research or analysis such as dye studies or stream flow lines. Since this Con Edison contention has not been accepted by the other parties in the past, it is essential that any research program include a project to ascertain where the water entering the Indian Point intakes is drawn from.

8. Entrainment Studies.

The entrainment studies at Indian Point are discussed in the testimony of John R. Clark in this proceeding. As with the "f" factors, the failure of Con Edison to provide requested data on these studies has made it impossible to conduct a full, independent review and analysis of the studies.

9. Compensation.

There is little or no new information on the issue of compensation provided by Con Edison on the basis of its research program. The Con Edison position and the Staff position are discussed in the testimony of John R. Clark in this proceeding.

In the Indian Point 2 proceeding, HRFA relied heavily on the evidence that was available as to whether or not there was a compensatory mechanism operating in the Hudson River striped bass population, particularly during the first year of life. Con Edison's position that compensation was operating in the Hudson striped bass stock was based on a literature review rather than on data developed on the Hudson.

In any further hearing on this issue, HRFA and SOS would undertake extensive cross-examination of Con Edison's witnesses on the literature review alleged to support the contention that compensatory mechanisms are operating in the Hudson River striped bass population. A review of this literature raises serious questions as to whether the articles cited, either through the conclusions of the authors or the data analyzed, supports the contention that the animal populations discussed in fact exhibit the operation of compensatory mechanisms.

10. Mitigation Measures: Hatcheries and Stocking.

This subject is discussed in John R. Clark's testimony

in this proceeding.

11. Monitoring Program.

The monitoring program will be established in the Technical Specifications. One point is worth underscoring here. It is apparent from the analysis carried out by the Staff in the Final Environmental Statement and from the course of the proceeding conducted last fall before the Federal Power Commission on the impact of the proposed Storm King pumped storage project on the Hudson fishery, that all the parties which have taken an active part in analyzing the effects of power plant operation on the Hudson fishery have a keen and important interest in obtaining access to the data developed by Con Edison's research program. Invariably, it is necessary for the parties to obtain the raw data for the purposes of their own analysis rather than relying on the conclusions reached by Con Edison's consultants in analyzing the data. In the past the procedure has been to await publication of a consultant's report and then request that Con Edison furnish the parties with the data on which the report relies. This process means that the other parties only begin their analysis after Con Edison has finished its analysis and frequently the company is in the position of asking an administrative agency to take action on some licensing request promptly following the submission of its analysis so that the work

of the other parties goes forward under very real time pressures.

This problem could be remedied by requiring in the Technical Specifications that Con Edison provide to the other parties the data from its research program in a reasonably short period after the data is compiled for the use of Con Edison's consultants and well in advance of the publication of the consultants' analysis and reports. HRFA and SOS urge that this procedure be made a requirement of the Technical Specifications so that the results of the research and monitoring program be made available to all the parties on a timely basis.

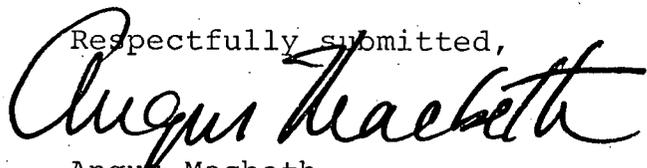
12. Indian Point 3 in the context of other electric power plants operating or planned to operate on the Hudson.

The Final Environmental Statement is the first analysis from a government agency which analyses the impact of all the power plants operating or planned to operate in the immediate future along the crucial middle reach of the Hudson. HRFA and SOS completely support this analytic approach and are in general agreement with the conclusions of the Staff analysis of multi-plant impacts on the annual production of Hudson-spawned striped bass.

Analysis of many of the other plants on the River is now in progress before other federal agencies. The EPA permits under the 1972 Federal Water Pollution Control Act

Amendments were discussed in section 1 above. As part of the consent decrees settling the cases of Hudson River Fishermen's Association v. Orange and Rockland Utilities Inc., 72 Civ. 5460 (S.D.N.Y.), and Hudson River Fishermen's Association v. Central Hudson Gas & Electric Corp., 72 Civ. 5459 (S.D.N.Y.), the Army Corps of Engineers is preparing an environmental impact statement on those plants. On the basis of the remand ordered by the Second Circuit Court of Appeals in Hudson River Fishermen's Association v. Federal Power Commission, 498 F.2d 827 (2d Cir. 1974), the FPC held hearings on the fishery impacts of the proposed Storm King plant in the fall of 1974. The future course of that proceeding has not been finally determined at this time. As a result of the order of the Second Circuit Court of Appeals in Scenic Hudson Preservation Conference v. FPC, 499 F.2d 127 (2d Cir. 1974), the Army Corps of Engineers is preparing an impact statement in connection with Con Edison's application to fill parts of the Hudson River at the Storm King site. None of these review procedures has been completed at the present time.

Respectfully submitted,



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