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Comments Submitted to the Atomic Energy Commission on Behalf of the Hudson River Fishermen's Association on the Draft Detailed Statement on the Environmental Considerations Related to the Proposed Issuance of An Operating License to the Consolidated Edison Company of New York for the Indian Point Unit No. 2 Nuclear Generating Plant

Docket No. 50-247

Submitted by

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The interest and concern of the Hudson River Fishermen's Association in the environmental impact of Con Edison's Indian Point 2 nuclear plant has focussed primarily on three issues:

1. The effect Indian Point 2 will have on the fish and aquatic biota of the Hudson.

2. The environmental effects of operating natural draft closed cycle cooling towers at Indian Point - a cooling alternative which would save the Hudson River fishery.

3. The need for the power which would be generated by Indian Point 2.

In the draft environmental statement on Indian Point 2, "Draft Detailed Statement on the Environmental Considerations Related to the Proposed Issuance of an Opearating License to the Consolidated Edison Company of New York for the Indian Point Unit No. 2 Nuclear Generating Plant, Docket No. 50-247," the staff deals with these issues with varying degrees of realism and rigor. The report is comprehensive but nevertheless there are major flaws in the analysis of each issue. The AEC staff analysis of each of the three major issues will be discussed in turn and a final section will deal with the cost-benefit analysis.

I. The Effect of Indian Point 2 on the Fish and Aquatic Biota of the Hudson River

The draft statement predicts the possibility of a major impact on the Hudson River fishery:

> "In Unit No. 2, aquatic biota impinged on the intake structure or entrained in the cooling water will be exposed to severe mechanical, chemical (chlorine), and thermal conditions; as a consequence, up to 25% of the average number of eggs and larvae of certain species of fish that annually pass by the Plant may be killed; under the most adverse conditions, up to 100% of some of the entrained planktonic species may be killed; and fish kills of a magnitude two or three times greater than those caused by Unit No. 1 may occur." [Draft Environmental Statement, p. ii]

In reviewing the first 100 months of operation at Indian Point 1, the AEC concluded that "Indications are that several million fish were killed." (DES, XI-7). In other words, the draft environmental statement contemplates annual kills at Indian Point 2 by impingement alone of a million fish or more.

Thus the percentage of fish killed by entrainment and the absolute numbers of fish killed by impingement will be very substantial indeed. Discussing the effect of both entrainment and impingement on the striped bass, the best studied and economically most important fish in the Hudson, the AEC staff concluded:

> "...the total yearly recruitment loss for each subsequent year class in the population may be as high as 15% to 20% from direct effects of Plant operation. Sustained reporductive losses of this magnitude over a long period of time would result in substantial reductions of the striped bass populations that spawn in the Hudson, including those of both the Hudson itself and the area from the south New Jersey coast to Long Island Sound." (DES, V-53)

The staff also pointed out that its analysis of the striped bass will apply to other fish as well:

> "These same arguments apply to other species that spawn in the area and may cause important losses of recruitment to local populations of the alewife, blueback herring, bay anchovy, tomcod, smelt and Atlantic silversides, as well as striped bass. (DES, V-55)*

This analysis has the basic comprehensive approach which is essential to a discussion of the effect of the operation of Indian Point 2 on the Hudson and its biota. But there are major flaws in the analysis. These are discussed below.

A. Failure to give a coherent account of the striped bass life cycle and population data which relates entrainment to impingement

The draft statement provides an analysis of the impingement problem which cites a number of absolute figures on past fish kills (DES, V-29 to V-33; V-46 to 47). The heart of the entrainment analysis discusses the effect on the fish in terms of percentages of the fish population (DES, V-52 to 55). In order to develop a coherent analysis of the effect of the operation of Indian Point 2 on the Hudson fishery it is essential that the impingement and entrainment figures be treated in similar terms, either absolute or percentage. The staff should attempt to develop an analysis along these lines.

John R. Clark, the expert consultant to the Hudson River Fishermen's Association on fish biology, has performed an analysis of this sort for HRFA and it is appended to these comments both for the value of the information it contains and as a pointed example of the kind of discussion which allows

*The omission of white perch from this list appears to be an obvious typographical error and should be corrected.

a full analysis of the effect of plant operation on the Hudson.

A coherent analysis of the type suggested will require fuller discussion of two other items. First, there must be a critical appraisal of the fish impingement data from Indian Point 1 and 2. The most obvious issue raised is the trustworthiness of Con Edison's figures in light of the Raytheon statistics cited in the draft statement which show both much larger total kills than comparative Con Edison figures and a much larger percentage of striped bass in the total kill (DES, V-31). Second, a discussion of the life cycle of striped bass touching on the rate of natural mortality and the period of vulnerability to the Indian Point plants is important to an understanding of the assumptions which underlie the analysis. At the present time figures describing the total effect on the fish population are given with little or no explanation of how those figures were arrived at. Both of these points should be developed and clarified in the final statement.

B. Unsupported reliance on density-dependent and compensatory factors

The draft statement discusses the possible compensatory factors involved in density-dependent influences on the mortality rate (DES,V-53 to 55). This discussion contains very little evidentiary support for the theory that throughout the first year of life striped bass mortality is not density independent.

In fact, the evidence suggests that after the fourth

or fifth week after spawning the striped bass mortality is density independent. Recent studies from California suggest this. Sommani, P., "A Study On the Population Dynamics of Striped Bass. (Morone Saxatilis Walbaum) In the San Francisco Bay Estuary", University of Washington Abstract; Turner, Jerry L. and Harold K. Chadwick,"Distribution and Abundance of Young-of-the-year Striped Bass, Morone Saxatilis, In Relation to River Flow in the Sacramento-San Joaquin Estuary" (to be published in Trans. Am. Fish Soc.). In Chesapeake Bay the fishery has been found to vary an order of magnitude depending on the strength of the recruitment. (Mansueti, R.J. & E.H. Hollis. 1963. U. of Md. Nat. Res. Mgt. Educ. Sci. (61); Hollis, E. H., Md. Dept. Ches. Bay Affairs. Final Rep. 1967; Koo, Ches. Sci ___ ____.)

These studies all indicate that striped bass mortality is density independent beginning at a very early stage of life, probably in the second month after spawning. Striped bass appear to be a year class dominant species.

Another major indicator of compensatory factors is the growth rate. Stunted growth might indicate that thinning of the fish population would result in the same weight of fish per acre being spread among fewer, larger fish. There is no indication of stunted growth in the Hudson in comparison to other estuaries. Hudson striped bass at the end of 15 weeks (Carlson, F. T. & J. A. McCann, Hudson River Fishery Investigations 1965 - 1968, Table 24; Rathgen-Miller. 1957. N.Y. F. & G.

Journ. 4 (1)), are the same length as striped bass in the Chesapeake (Mansueti, R. 1958. Md. Dept. Res. & Ed. Contr. No. 112; Hollis, E.H. 1967. Md. Dept. Ches. Bay Affairs. Final Rep. 1967.) and the San Joaquin-Sacramento (Sasaki, S. 1966. Cal. Dept. F. & G. Fish Bull. (136)). They are larger than those in Albemarle Sound. (Trent W.L. 1962. Master's Thesis, N.C. State Col. Dept. of Zoology.)

Comparative data for the early stages of white perch are not available, but at the end of the first year Hudson River white perch (Lauer, McFadden, Raney, Testimony of April 5, 1972 in this proceeding.) are about equal to those in the Chesapeake (Mansueti, R.J. 1961. Ches. Sci. 2 (3-4)) and the Delaware (Wallace, D.C. 1971. Ches. Sci. 12 (4))* At the end of three years Hudson River white perch (Lauer, McFadden, Raney, Testimony of April 5, 1972 in this proceeding) are again equal to those in the Chesapeake (Mansueti, R.J. 1961. Ches. Sci. 2 (3-4)) and the Delaware (Wallace, D.C. 1971. Ches. Sci. 12 (4)).

Finally, there are no indications of overcrowding of the fish population in the Hudson which might also indicate stunted growth and the likely presence of compensatory factors. (Compare Environmental Report Supplement No. 3, S3-25 to 30 with HcHugh, J.L. 1967. Estuaries, AAAS Pub. No. 83).

* Estimates for conversion between standard length, total length and fork length must be made.

Both the data on mortality and the data on growth suggest that very early in the life cycle of the striped bass- probably some time in the second month - the killing of striped bass larvae and juveniles begins to have a direct effect on the number of striped bass which survive to the end of the first year. Moreover, the thinning of the larval and juvenile population will not be compensated for by an increased growth rate among the remaining fish.

The staff should re-analyze its position on density-dependent mortality and compensatory effects, taking into account all the available data on the subject. If a case is to be made for the position suggested by the staff in the draft statement, it should be spelled out with much more evidentiary support than appears in the draft statement.

C. Failure to consider the effect of other electrical plants presently operating on the Hudson and scheduled to begin operation in the immediately foreseeable future

Fish kills due to entrainment through power plant condenser systems are a function of the volume of water withdrawn from the River, the degree to which it is heated and the abundance of eggs, larvae and young juveniles in the area where the plant is sited.

Indian Point Units 1 and 2 will withdraw 1,140,000 gpm from the Hudson. (DES, III-6, III-12). The water will be heated 15°F (DES, III-8) and then discharged to the River. Indian Point is situated at River Mile 43, an area which is of very high abundance in striped bass eggs, larvae and young juveniles. (DES, V-45).

The Bowline Point plant of which the first unit is scheduled to go on line in July 1972 and the second unit by 1974 (DES, III-7), will withdraw 768,000 gpm from the Hudson and heat it 13.5°F before discharge to the River (DES, III-8). Bowline Point is at River Mile 38, 5 miles from Indian Point, and there is an abundance there of striped bass eggs, and a great abundance of larvae and young juveniles.

The Roseton plant, of which the first unit is scheduled to begin operation in November 1972 and the second in May 1973 (DES, III-7), will withdraw 650,000 gpm from the Hudson and heat it 15.4°F before discharge. (DES, III-8). The Roseton plant is located at River Mile 65, 22 miles north of Indian Point in a reach of the River where the eggs and larvae of striped bass are abundant.

The Danskammer plant, presently in operation (DES, III-7), withdraws 308,000 gpm from the Hudson and heats it 14.5° before discharge (DES, III-8). The Danskammer plant is located at River Mile 66 and the aquatic biota is the same as that at the Roseton plant.

The Lovett plant, presently in operation (DES, III-7), withdraws 323,000 gpm from the Hudson and heats it 14.8° before discharge (DES, III-8). The Lovett plant is located one mile downstream from Indian Point and the aquatic biota is the same as that at Indian Point.

It is obvious that this total array of plants will have a very significant impact on the Hudson River fishery. The staff has estimated that Indian Point Units 1 and 2 may kill

off 25% of the striped bass eggs and larvae which pass the plant. Bowline Point and Roseton together will withdraw a third again as much water as Indian Point 1 and 2 and heat it approximately the same amount. It is conservative to estimate that Bowline Point and Roseton will annihilate an additional 15% of the striped bass eggs and larvae in the Hudson. In addition the Danskammer and Lovett plants are already operating on the Hudson and using substantial amounts of river water for cooling thus adding to the total stress on the River system. The combined effect of the operation of all these plants will decimate the Hudson fish population in a fantastic manner-more than 40% of the striped bass eggs and larvae in the River will be entrained annually.

Con Edison has requested a license to operate the Indian Point 2 plant for a period of forty years. It is, of course, clearly foreseeable that some or all of these four plants will operate during any period for which Indian Point 2 is licensed. Thus Indian Point 2 will operate in an environment on which Bowline Point, Roseton, Danskammer and Lovett will have a significant effect. Bowline Point and Roseton are not scheduled to undergo a N.E.P.A. review. Danskammer and Lovett have not undergone a N.E.P.A. review. Thus these plants cannot be viewed as producing increments of environmental impact which have been or will be reviewed before they are allowed to

begin operation. In these circumstances the impact of Indian Point 2 must be weighed in light of the knowledge that within a few years the total impact of the Bowline Point, Roseton, Danskammer, Lovett and Indian Point 1 and 2 cooling systems will be thrust on the Hudson and its biotic life. The AEC must reach a decision as to whether the present cooling system planned for Indian Point 2 is acceptable not only in May or June of 1972, but also in July 1972 when Bowline Unit 1 is operating and two years from now when all the units at Bowline Point and Roseton are withdrawing their vast quantities of water from the Hudson and discharging their heated load to the River with the attendant effects of impingement and entrainment.

Not to consider the clearly foreseeable effects of Bowline Point and Roseton is tantamount to not considering winter operations on the ground that the license was applied for in the spring. The only rational procedure in analyzing the impact of this facility is to take into account the present and the foreseeable future plant operations which are not themselves subject to a similar review under NEPA.

The law follows this rational line and instructs Federal agencies to take a wide and comprehensive view of their duties under the National Environmental Policy Act, 42 U.S.C. §4321, et seq. In Section 102 of NEPA, federal agencies are directed that "to the fullest extent possible" the policies of NEPA are to be carried out in all of the agency's activities, including, but not limited to, the preparation of environmental impact

statements.

The term "to the fullest extent possible" has been the subject of both Congressional and judicial interpretation. The Senate and House conference, which wrote the phrase into NEPA, stated:

> The purpose of the new language is to make it clear that each agency of the Federal Government shall comply with the directives set out in [Section 102(2)] unless the existing law applicable to such agency's operations does not make compliance possible.... Thus, it is the intent of the conferees that the provision "to the fullest extent possible" shall not be used by any Federal agency as a means to avoiding compliance with the directives set out in Section 102. Rather, the language in Section 102 is intended to assure that all agencies of the Federal Government shall comply with the directives set out in said section "to the fullest extent possible" under their statutory authorizations and that no agency shall seek to construe its existing statutory authorizations in a manner designed to avoid compliance. 115 Cong. Rec. 40417-40418.

In Ely v. Velde, __F.2d__, 3ERC 1280, 1285 (4th Cir. 1971), the Court of Appeals for the Fourth Circuit held that the phrase is "an injunction to all federal agencies to exert utmost efforts to apply NEPA to their operations. In short, the phrase 'to the fullest extent possible' reinforces rather than dilutes the strength of the prescribed obligations."

In Calvert Cliffs' Coordinating Committee v. AEC, __F.2d__, 2 ERC 1779 (D.C. Cir 1971), the Court of Appeals for the District of Columbia carefully considered the phrase, "to the fullest extent possible" and concluded that Section 102 must be complied with (2 ERC at 1782): "unless there is a clear conflict of statutory authority" and further explicitly instructed the Atomic Energy Commission that "the requirement of environmental

consideration 'to the fullest extent possible' sets a high standard for the agencies, a standard which must be rigorously enforced by the reviewing courts." (Ibid.) In the revised Appendix D to 10 CFR Part 50 the Commission has set out to apply the instructions of the Court in Calvert Cliffs.

There can be little question that if the environmental effects of the operation of Indian Point 2 are considered "to the fullest extent possible" that consideration will include analysis of the impact which may be foreseen and calculated over the next few years when Indian Point 2 will be operating on the same stretch of river with Bowline Point, Roseton, Danskammer and Lovett which have not and are not scheduled to undergo NEPA review.

The staff obviously recognizes the relevance and importance of these plants when it includes in the draft statement on Indian Point 2 an analysis of the plants' physical relation to the Indian Point site (DES, II-7), their contribution to the heat load on the Hudson (DES, III-7 et seq.) and their importance to the future power supply in the area (e.g. DES, XI-5). The only logical step to take is to consider the impact of Bowline Point, Roseton, Danskammer and Lovett on the fish and aquatic life of the Hudson as well.

In addition, putting off consideration of these plants to any later date will only fragment consideration of a single problem into a multitude of small pieces. Such fragmentation does not make sense in scientific terms or in terms of administrative efficiency. John R. Clark has analyzed the probable effect of Bowline Point and Roseton when they are operating

in conjunction with Indian Point 1 and 2. That analysis is appended to these comments for the use of the staff in expanding their analysis to take those plants as well as Danskammer and Lovett into account in developing the final statement.

Common sense, the language of NEPA, the legislative history of the Act and the judicial decisons under the Act all require that the NEPA review on the application for an operating license for Indian Point 2 take into consideration the environmental impact of present or foreseeable actions which are not themselves subject to NEPA review. Nothing less can implement the Act's requirement that its policies and procedures be followed "to the fullest extent possible."

D. Failure to consider relevant law of the State of of New York

The AEC's regulations on the licensing of nuclear power plants state that:

> The Commission will incorporate in all ... operating licenses ... a condition ... to the effect that the licensee shall observe such standards and requirements for the protection of the environment as are validly imposed pursuant to authority established under Federal and State law and as are determined by the Commission to be applicable to the facility that is subject to the licensing action involved. 10 CFR Part 50, App. D, § A.13.

Pursuant to that regulation and the Federal Water Quality Act of 1965, the staff included in the draft environmental statement a careful discussion of the thermal discharge standards of New York State and the status of Con Edison's application for a Refuse Act discharge permit. (DES, III 7-12). In discussing alternatives to the present plant at Indian Point, the staff also rejects the possibility of not providing

power "in view of the applicant's obligation under its charter from the State." (DES, XI-1).

The draft statement is totally silent on those elements of state law which deal with the protection of fish.

Section 275 of the New York Conservation Law states: "No person shall take fish ... by shutting or drawing off water." Section 389(4) of the Conservation Law sets a specific civil penalty for violation of Section 275, $500 and "an additional penalty of ten dollars for each fish taken." These statutes involve no weighing and balancing. Section 275 is a simple and direct prohibition and Section 389 is a straightforward civil penalty.

These sections of the law are being actively enforced. In late February approximately 160,000 fish were killed at Indian Point 2 when 2 of the 6 pumps were put through a test run. (DES, V-31). As a result of those kills, the N.Y.S. Commissioner of Environmental Conservation has asked the Attorney General to sue Con Edison for $1.6 million. That suit has been filed and relies on Sections 275 and 389 of the Conservation Law.

Under both the Commission's regulations and in view of the actions taken by the New York State authorities, the AEC should give careful consideration in its statement to possible violation of New York law and require that Con Edison operate the plant within the standards set by the New York legislature for the protection of fish.

In light of the suit by the Attorney General future fines must also be taken into account in the cost-benefit analysis. Present staff estimates indicate that millions of fish will be killed at Indian Point 3. The AEC must recognize that this will cost Con Edison and perhaps its consumers tens of millions of dollars.

E. Proposal to request Con Edison to conduct research on Hudson fish and biota.

Rather than requiring Con Edison to begin immediately the construction of an alternate cooling system at Indian Point, the draft statement proposes that Con Edison undertake a research program on the basis of which future action would be decided:

> An operating license would permit the applicant ... to establish an effective environmental monitoring program in conjunction with an alternative plan to limit the effects on the aquatic system. The applicant shall be required to evaluate and assess the data collected from the monitoring program in order to design and implement an alternative plan or plans to minimize the long-term potential damage to the aquatic biota in the Hudson River. The applicant shall be required to submit to the Commission within the next 6 months a plan or plans of specific detailed design of the best alternative system that it can determine which will result in an optimization of Plant operation and minimal environmental damage.... The Technical Specifications to be provided with an operating license will specify the limitations of specific effluent discharges and the ecological monitoring surveillance program required with the necessary administrative controls, to assure adequate data will be collected for use to assess the biological impact of operation of Indian Point Unit No. 2 on the environment. (DES, XI-55).

There are two major failings in this suggestion. First, it turns over the research function to a party which has been shown to be incompetent in the past and which has a clear and

unmistakable interest in the outcome of the research. Second, it fails to set any standard by which damage to the Hudson will be measured.

The staff itself recognizes Con Edison's past incompetence in conducting and reporting research on the Hudson. Speaking generally, the staff has concluded that: "It is apparent that many of Con Edison's conclusions are not consistent with the data acquired by its consultants." (DES, V-55).

The staff drives the point home with an illustration of a Con Edison statement that the eggs and larvae of six key Hudson River fish are not vulnerable to the intake and thermal plume at Indian Point,"Extensive data gathered by the Raytheon Company and by Northeastern Biologists, both of which are consultants for the applicant [Con Edison] clearly show that larvae of the striped bass, alewife, and blueback herring are susceptible to the intake and thermal plume." (DES, V-56).

The self-interest which will permeate Con Edison's research effort is patent and obvious. Common sense dictates that giving Con Edison control of this research project is ridiculous. Moreover the courts have found conditions of this sort in licenses to be absurd. The N.Y.S. Commissioner of Environmental Conservation attached conditions of the same kind to the water quality certificate for Con Edison's Storm King project and they have been struck down by the state court:

> [T]hese conditions would require Consolidated Edison immediately to terminate the operation of its project upon evidence of "violations or contravention of the

> water quality standards assigned to the Hudson River" ... The monitoring of the project to assure that these conditions were fulfilled was delegated to Consolidated Edison. ...It is also urged that in operation the conditions were impractical to the point of being ridiculous in the light of human experience. Consolidated Edison is by these conditions called upon to police itself and if it finds itself violative of the Commissioner's conditions to abandon immediately its multi-million dollar project. This Court hearing no sound contrary argument and failing to imagine any concludes the conditions to be meaningless in law and fact. In the Matter of DeRham v. Diamond - N.Y.S. 2d-, 3 ERC 1903, (N.Y. Sup. Ct. 1972).

The same arguments hold true in this case. Con Edison's interest in Indian Point 2 is just as great as that in Storm King.

The whole research effort is further flawed by the failure to establish any firm criteria by which the results can be measured. This is an abdication of the AEC's duty under NEPA to reach a judgment on the plant. The Commission must put in the scale some level of fish destruction which it finds unacceptable. Any other course fails to focus the controversy over this plant in such a way that it may be resolved. Since it will take at least three years to build an alternate cooling system, there must also be a strict time limit on when the results of research will be evaluated. It is all too likely that the Hudson fishery will be decimated before Con Edison is ready to accept responsibility for the environmental damage it will cause at Indian Point.

It may also be true that the necessary research cannot yield the knowledge which is sought. In discussing the indirect effects of plant operation, the AEC staff says:

> "At Indian Point, the complexity of the interactions of the biota with each other and through natural cycles of salinity and temperature is very difficult. Unfortunately, even if all of the relationships were known, reliable biological predictions of the indirect effects of the operation of the facility could not be developed with the present state of the art." (DES, V-35)

If this is true of other research areas as well, then the research program should be dismissed as useless and a judgment made on the plant on the basis of present knowledge.

The AEC is proposing a voyage into complex research with no particular port in mind and on a ship skippered by a captain who has no interest in ever arriving. In the light of human experience this is ridiculous. It may also be scientifically fruitless. The plan should be rejected and the requirement of an alternative cooling system should be imposed immediately.

II. The Effect of Operating Closed Cycle Natural Draft Cooling Towers at Indian Point 2

The installation of natural draft closed cycle cooling towers at Indian Point 2 would reduce withdrawal of water from the Hudson by 95% or more. In consequence there would be similar massive reductions of the harm caused the fish and aquatic biota of the Hudson.

Various objections to this solution have been raised. Con Edison has come to the conclusion that aesthetics and costs are the major objections and it has rejected the notion that saline drift or fogging will cause any serious adverse

impact. (Environmental Report Supplement 3).

The draft statement includes statements which support the conclusion that saline drift from natural draft closed cycle cooling towers will be negligible or unimportant. In discussing the effects on people the staff concluded: "...any salts from the natural-draft cooling towers that might reach underground wells will have negligible effect on the water supply." (DES, XI-32). The same conclusion held for effects on plant life: "Since the data show no salt deposition rates in excess of 500-1,000 lbs/acre/year, there will be no environmental costs to plant life in the area associated with these alternatives." (DES, XI-33). With regard to property the AEC concluded that"salt deposition rates are relatively low" and estimated the environmental cost at 0 dollars. (DES, XI-34).

These conclusions are the same as those of Con Edison and the Hudson River Fishermen's Association and Environmental Defense Fund (Eric Aynsley, Testimony of April 5, 1972 in this proceeding). In fact at one point the report specifically states that "The staff accepts the applicant's salt deposition rates" (DES, A-78).

Nevertheless, the draft statement includes the following unsupported statement:

> The principal objection to using evaporative cooling towers [e.g. natural draft closed cycle cooling towers] at the Indian Point site is the high range of salinity content of the Hudson River (100 to 7,000 ppm). The damaging effects of the salt-water drift on metallic objects and plant life could be detrimental. Until such a time as research can produce brackish water cooling towers with very low drift and environmental

impact, their use is not practical.(DES, XI-9).

This surprising statement is supported by no data and is in direct contradiction to the other analysis contained in the draft statement.

The AEC must either support this statement with hard data or abandon it. All the evidence from Con Edison, the Intervenors and the rest of the draft statement suggests that the AEC should abandon this position.

Cooling towers at Indian Point are practical. Saline drift is not a major problem. The AEC should focus on the practical problems at the plant, primarily the cost of cooling tower construction, and not reintroduce the discredited issue of saline drift.

III. Indian Point 2 and Con Edison's power crisis

On April 1, 1972 Con Edison informed the AEC that Indian Point 2 would not be ready to go critical until late June 1972. In October, 1971 Con Edison gave the AEC a schedule of the testing procedures which it must complete at Indian Point 2 before the plant can operate at full capacity (Con Edison, Testimony of October 19, 1971 in this proceeding, at 1-2). Con Edison also stated that this was a "best circumstances" schedule and that a realistic schedule would double the time for testing.

Con Edison requires 69 days for testing under best circumstances and 138 under a realistic schedule. Both realism and the past history of Indian Point 2 indicate that a schedule of 138 days is the only one that can be used with

any confidence.

Assuming that Indian Point 2 is ready to begin testing on July 1, 1972, the testing schedule would be completed on November 15, 1972. In other words, Indian Point 2 will be ready for operation during the winter of 1972 at the earliest.

It is obvious that the staff's analysis of the demands on the Con Edison system was written before Con Edison's announcement of April 1, 1972. Throughout the section on power demand, the statement again and again emphasizes the situation in the summer of 1972 (DES, X-1 to 13). In light of Con Edison's own estimates of its testing schedule, this analysis is simply irrelevant to Con Edison's license application. The plant will not be operating during the summer of 1972.

Moreover, this focus on the immediate future is a major flaw in a report prepared for a 40 year operating license. A long-range project needs long-range analysis. This is something which the staff should cure in its final statement.

The analysis of power demand must be undertaken independently by the AEC and not be simply adopted from Con Edison or other governmental agencies. Other agencies and the applicant cannot be relied on for the simple reason that they disagree among themselves to the point where no coherent discussion of the power demand situation can be developed by simply collating agency or Con Edison statements. This can be demonstrated by the figures provided by the FPC, the New York PSC and Con Edison for summer 1972:

Summer 1972

	Con Edison*	PSC Staff*	FPC with IP 2**	FPC without IP 2**
Total Available Capacity (MW) (FPC-Net-Dependable Capability)	10031	8758	9884	9448
Reserves (MW)	1481	208	1334	898
Reserves as % of Peak Load	17.3	2.4	15.6	10.5

* "The New York Power System Generation and Transmission Plans 1971-1980", System Planning Section, Power Division of the New York Dept. of Public Service (12/71) at 10. The Con Ed figures represent a forecast based on all plans being implemented on schedule. The Staff estimate represents staff estimates of delays. Cited in DES at X-13

** DES, X-3. Bureau of Power, FPC (12/71).

These estimates were all made in December, 1971. They vary widely among themselves. They also vary widely from the actual facts as they are known today. In testimony submitted in the Indian Point 2 proceeding on May 18, 1972, Bertram Schwartz, a Vice President of Con Edison, stated that subsequent to July 15, 1972, Con Edison's installed reserves "will reach 24.9% (2095 MW)." (Schwartz testimony at 4). This figure does not include Indian Point 2 or a possible purchase of 95 MW from Long Sault, Inc. These figures are utterly different from any of the predictions.

We are thus left with a chaotic jumble of figures most

of which seem to bear little relation to the facts. In this situation the AEC staff cannot simply adopt the figures of one agency or another. It must perform its own analysis of the power demand situation. That is the only way in which an accurate and factual description of the situation can be arrived at.

The analysis must, of course, address itself to the constituent elements of power supply and demand: monthly variation of power demand, retirement and maintanance schedules, purchasing opportunities, power pool agreements, voltage reduction procedures, variations in thermal efficiency, alternative sources of supply to consumers such as the Fitzpatrick plant. This list is suggestive but not exhaustive. No final judgment about the power supply and demand situation can be made without this kind of analysis of the facts. No reliable cost-benefit analysis is possible without this kind of factual foundation.

The applicant and the state and federal agencies can provide useful information with which to commence the power supply and demand analysis, but under NEPA it is the AEC which must make the judgments and that can only be done on the basis of facts which have been independently analyzed. That is the teaching of Greene County Planning Board v. FPC, -F.2d-, 3 ERC 1595 (2d Cir. 1972). It is also the teaching of common sense.

IV. The Cost-benefit analysis

The cost-benefit analysis in the draft statement is remarkable for its lack of any coherent relationship to the analysis which proceeds it. The cost-benefit analysis is largely a summary of the position taken by Con Edison and not that developed by the staff in its own analysis. This is true even at places where the earlier analysis of the draft statement differes markedly from Con Edison's analysis.

Typically, in dealing with the fishery the applicant's estimate of environmental cost of 0 fish/year is set forth and a paragraph of staff comment is followed by three pages of quotation from Con Edison (DES, XI-23 to 27). Since the staff analysis utterly disagrees with Con Edison's estimate it is difficult to see why any of the Con Edison statement is quoted. It is particularly distreesing that the staff supplies no estimate of its own of the environmental cost. In effect, the staff appears to have abandoned its task of reaching an independent conclusion based on the analysis which it has undertaken.

Throughout the cost-benefit chapter there is an ambiguity and confusion in the writing which indicates a fundamental uncertainty on the part of the staff as to what its task is. For instance the paragraphs on environmental costs which appear at DES, XI-18 to 28 repeatedly give the Con Edison's estimate of the environmental cost and follow it with an explanation or commentary from the staff. The tone consistently suggests that the staff feels that its task is to explicate the company's position or, at most, tinker with Con Edison's estimates. This

is entirely the wrong procedure. The cost-benefit analysis must grow out of the analysis of the impact of the plant which has been undertaken by the staff. Just as the analysis of the first ten chapters is an independent one which uses Con Edison information but does not treat it as having a special status of unquestionable veracity, so the cost-benefit discussion must also treat Con Edison's presentation as nothing more than useful. The cost-benefit analysis must flow out of the earlier analysis of the staff and not out of the Con Edison analysis, much of which the staff has discredited and discarded.

There are a number of points at which the conclusions of the cost-benefit analysis misstate or ignore the basic analysis performed by the staff. One of the most shocking failures to integrate the cost-benefit analysis to the rest of the statement occurs in the discussion of the Indian Point 2 cooling system where the section on cost-benefit states:

> The staff's analysis of the effects of the present cooling system on the Hudson River indicates that the complex estuarine environment could be irreversibly damaged from long-term operation or Unit No. 2. The staff's analysis was appropriately conservative, in accord with the nature of the environmental risk, and may therefore overestimate the long-term cost. (DES, XI-55)

The cooling system will, of course, have two major effects - the impingement and entrainment of fish. There is nothing to suggest that the broad and general statements on impingement are in any way conservative. The statement on entrainment is explicitly realistic (DES, A-69) and the analysis of compensatory factors and density-dependence probably underestimates the effect on the fish population considerably.

(See comments at I · B above).

There is simply no basis for the conclusion that the staff analysis on the effects of Indian Point 2 on the Hudson biota is conservative. Contradictions of this sort between the factual analysis and the conclusions of the cost-benefit analysis must be rooted out in the final statement. The cost-benefit analysis must flow directly and coherently from the factual analysis.

Finally, the cost-benefit analysis must take into account the fines for the killing of fish which the Attorney General of New York is now seeking from Con Edison and the liklihood of the plant being ordered to cease operation if the fish kills continue. The question of fines for fish kills is discussed fully at I·D above. The staff must estimate the number of larvae, juveniles and adults which will be killed annually at Indian Point 2 and figure into the cost-benefit analysis the fact that Con Edison is incurrring a liability of ten times as many dollars. In other words, if, say, 3 million larvae, juveniles and adults of any species are taken at Indian Point by the drawing off of water, Con Edison will be liable for fines of $30 million under the Conservation Law of the State of New York.

This spring Con Edison was ordered by the New York State Department of Environmental Conservation to cease operation of its pumps at Indian Point 2, an order which remained in effect for at least 2 1/2 months and may not yet be dissolved. This order was based on the illegal fish kills which took place at Indian Point 2 in February. In estimating the possible

benefits from the plant, the staff must estimate the liklihood of similar orders in the future. In other words, if the staff believes that substantial fish kills will take place at Indian Point 2, it must include in its calculation of the benefits from the plant the liklihood that the plant will not be allowed to operate for substantial portions of the year.

Con Edison is in an awkward position. It has obligations to provide power to its customers, but if it does so by killing Hudson River fish it makes itself liable for fines at the rate of $10 per fish and it courts the real possibility that the state will order the plant closed down. The AEC cannot blind itself to these difficulties by pretending that the conservation laws of New York do not apply to Con Edison. The State Department of Environmental Conservation and the State Attorney General have made it clear that that is not the case. In weighing the costs and benefits of Indian Point 2 the AEC must take full account of the vast costs which will be imposed on Con Edison if it continues to make the killing of fish a part of the ordinary business of supplying power.

Conclusion

When a complete analysis of the impact of Indian Point 2 on the Hudson fishery is undertaken in the context of the other power plants on the River and with proper attention to the laws of the state of New York, the inevitable conclusion emerges that the Indian Point 2 plant can only operate if

closed cycle natural draft cooling towers are installed. The Hudson River Fishermen's Association urges the AEC to perform its duty under NEPA by carrying out the full analysis of the plant which is required by the Act, particularly covering the points spelled out in these comments, and at the end of that analysis HRFA respectfully submits that the AEC should condition the operation of Indian Point 2 on the construction of an alternate cooling system, in particular natural draft closed-cycle cooling towers.