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Docket No. 50-286

D. R. Muller, Assistant Director for Environmental Projects, L
THRU: G. W. Knighton, Chief, Environmental Projects Branch No. 1, L

COST-BENEFIT ANALYSIS DISCUSSIONS FOR FES FOR IP-3

As a result of our discussions after the July 30-31, 1974 meeting with the parties at ORNL, two meetings were held to scope out our approach on the benefit-cost analysis of IP operation on the Hudson River fisheries. These meetings were set up with the intent to scope out a general overview of the problems involved and then to focus more specifically on the IP case.

I. TR Meeting on August 7, 1974

The first meeting was with Dr. Spangler of Technical Review and several of his Cost-Benefit staff (Cleary, Nash and Pollnow). G. W. Knighton and the EPM attended. This meeting resulted in the recommendation that we should try to consider the following in the IP benefit-cost analysis:

- (1) Public interests - Sport fishermen, commercial fishermen, nature preservationists, consumers, National, state, regional, and utility interests.
- (2) Value of the fishery preserved - Consumer surplus concept (acceptable costs over market value).
- (3) Cost Effectiveness - Costs to take the cheapest alternative approach - optimize the approach taken to get the most benefit for the dollars spent.
- (4) Benefits of Objectives - Try to measure fish cost directly versus the dollar value of the kw-hr of benefits generated in the action taken.
- (5) Nature Preservation Values:

a. Is a species endangered?

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M. J. [unclear]

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- b. Is biological integrity preserved or not disturbed? Is the maximum sustainable yield of the resource maintained?
- c. Religious values.

(6) Social Equity Approach - Costs to all, such as intrinsic values.

Dr. Spangler recommended that an optimum strategy through a bioeconomic model should be developed. He discussed the costs to the fishery by evaluating the delay of 1, 2, or 5 years before the cooling towers would be in operation to protect the fishery. There was a general feeling that the benefit-cost analysis should fundamentally recognize the costs fishermen are willing to pay to preserve striped bass fishing. These thoughts were carried on to the ORNL meeting on August 28, 1974.

II. ORNL meeting on August 28, 1974

This meeting was attended by:

ORNL

- R. Rush, Team Leader
- M. Carter, Cost-Benefit
- C. Garrison, Consulting economist at UT
- C. Boston, Cost-Benefit
- T. Row, Chief, ESS

AEC

- G. W. Knighton
- M. J. Oestmann

For the benefit of those present, T. Row summarized the previous approach taken on cost-benefit analysis with respect to the IP-2 FES and the DES for IP-3. The staff position in the IP-2 hearing was reflected in "the priceless natural resource" concept. He suggested that in the light of recent evaluations of impacts, a more rigorous benefit-cost analysis appears justified.

The following list of overall benefits to be derived by reducing or preventing the following environmental costs should a closed-cycle cooling system be installed was prepared:

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- (1) Estimated costs to sport and commercial fishermen to travel to another striped bass fishery source should fisheries be reduced at the first location when no mitigating method is used, or costs to catch another species of lesser appeal but not impacted by the plant operation (next best alternative approach).
- (2) Secondary impacts such as effects on local industry if relocation of fishermen's interests to another area occurs.
- (3) Nature preservationist's interests - protection of the environment for future generations.
- (4) Intrinsic values (both direct and indirect) which need protection such as value of fossil energy (mid-East oil) for other uses than electrical power generation.
- (5) State fishing regulations which recognize no taking of fish of certain types and sizes at different times of the year.
- (6) Tax to pay for each fish killed or the cost of running a fish hatchery to supplant the fish killed.
- (7) Impacts on endangered species.
- (8) Impacts on other species besides striped bass.
- (9) Secondary effects by loss of different fish or the other aquatic life which are part of the upper and lower food chain food.
- (10) Incremental impacts of each plant as well as of all plants on the Hudson during lifetime of IP. Incremental mitigating methods used at IP may or may not be of real significance. For example, when only IP plants have cooling towers, the impacts are reduced from 43% to 15%, but when all the Hudson River plants are considered, the impacts at IP are reduced from 62% to 46% when cooling towers at IP are used.
- (11) Protection of National, State, regional or local interests.

In general, the comparative costs of mitigating the impacts should include the following:

- (1) Capital costs of alternate cooling system.
- (2) Operating costs including derating effects and replacement power costs.

(3) Land use impacts of mitigating methods

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- (4) Terrestrial impacts
 - a. fog
 - b. chemical deposition
 - c. icing
 - d. noise
 - e. aesthetic effects
 - f. aircraft damage
- (5) Aquatic impacts from blowdown
- (6) Impingement and entrainment effects due to make-up water
- (7) Environmental impacts resulting from alternative power making up for derating.
- (8) Hatchery costs for stocking if used as an alternate.
- (9) If IP should be reduced in power or shutdown during the spawning season as an alternative mitigating method to reduce entrainment impacts, then environmental impacts of an alternate power source would result.

The treatment of costs, both quantifiable and unquantifiable, would be such that the utility pays the capital and operating costs of the alternate cooling system, but these costs are passed on to the user (consumer) who pays the electric bill. The utility is allowed an acceptable profit which comes from the consumer's bills. Additional costs also occur to society as a whole. The total costs involved must be weighed against the benefits gained to the fisherman and nature preservationists.

The methodology of estimating the environmental costs discussed included multiplying the loss of fish and other species due to the plant times a unit value. The unit value should be expressed as replacement costs (hatchery costs) or commercial fish catch or sport fish catch in dollars. Con Ed used this approach of estimating the annual dollars spent by multiplying the commercial fish catch times the proportion of the contribution of the Hudson River to the Mid-Atlantic fishery. Con Ed also used a dollar value for the recreational-day a sportman would spend to estimate annual costs. C. M. Carter also pointed out putting in escalation costs on the fishermen's efforts.

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Senate Document 97, which Dr. Oestmann discussed, discounts benefits and costs to present values.

In terms of the FES for IP-3, the ultimate goal is to restrict the benefits and costs to striped bass and other aquatic life versus those for the cooling towers operation. In the afternoon, it was decided that the benefit-cost analysis would use the output of the young-of-the year model and the adult model expressed as percentages; impingement expressed as number of fish killed on the intake structure each year; and the plankton effects in pound lost per year for determining the impacts. It was proposed that a consumer surplus model would be developed such as to derive a dollar cost per pound for each impact. Garrison recommended the approach to use would be to estimate costs that would be incurred by causing the fishermen to relocate to get the same amount of fish at a new location once the fish were depleted at the old location. In addition, intrinsic values of fish will be quantified by recognizing the dollars spent annually by national, state and regional agencies in order to manage, support, or improve fisheries. The value per pound will be determined on the basis of the money spent by Federal and State agencies to protect the total fish caught each year.

It was agreed that in addition to looking at the benefits and costs of IP, we would also include the benefits and costs in considering all the plants on the Hudson River. It was also agreed that the costs of mitigating impacts discussed previously should include the following:

- (1) Capital costs
- (2) Operating costs
- (3) Entrainment and impingement costs
- (4) Costs for replacement power for derating if the plant is produced on the Hudson.
- (5) Environmental costs such as additional SO₂ discharged from replacement power plants.

Two alternatives would also be considered, these are:

- (1) Hatchery stocking
- (2) Reduced power output (6 to 8 weeks per year) during the spawning season and high impingement periods.

Nothing earth-shaking came out of the meeting. Certain novel attempts to place a value on some of the environmental costs have been introduced. It was agreed that such approach as discussed must be investigated and properly applied in the benefit cost evaluation of IP-3.

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D. Rush and M. Carter were going to set up a small task force to look into the subjects discussed and come up with a specific plan to treat the cost-benefit aspects of the impacts for the FES for IP-3.

Original signed by
M. J. Oestmann

M. J. Oestmann, Project Manager
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V. Benaroya, Chief, Effluent Treatment Systems Branch, L
THRU: George W. Knighton, Chief, Environmental Projects Branch No. 1, L

RADIOACTIVE WASTE TREATMENT SYSTEM FOR INDIAN POINT UNITS NOS. 1, 2 & 3

In regard to the steam generator blowdown treatment system for Indian Point Units Nos. 1, 2 and 3, present plans call for treatment of the blowdown at the Unit No. 1 SBBPS through interties between Units Nos. 2 and 1 and Units Nos. 3 and 1. The applicant plans to modify its radwaste system to build these interties by May 1, 1975. The source term and corresponding radiological doses as described in the DES (Section V.E.) for Indian Point Unit No. 3 were based on the operation of Unit No. 1 for two thirds of the time. Unit No. 1 was estimated to be shutdown one third of the time.

Since Unit No. 1 will be shutdown on October 31, 1974 for two or more years in order to have an ECCS system installed, the radwaste releases may or may not meet "ALAP" guidelines with Unit No. 1 shutdown.

Please review the enclosed Section V. E. which is being used for the FES for Unit No. 3 to advise us whether the source term is still valid and whether other modifications to the text are needed. Please advise us as to whether we should meet with the applicant including PASNY to discuss the use of an alternate treatment system not involving Unit No. 1.

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Mary Jane Oestmann, Project Manager
Environmental Projects Branch No. 1
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Enclosure:
Draft of Section V.E. for FES for IP-3

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