



The staff of the Attorney General, as well as State experts and consultants, contend that the operation of Indian Point Unit No. 3 utilizing once-through-cooling will result in massive disruption of the ecological balance in the Hudson River. This disruption will be caused by

- I. Killing of significant numbers of fish by impingement on the intake screens.
- II. Killing and damage by entrainment in the cooling water flow of fish eggs and larvae.
- III. Killing and behavioral modifications of fish by the addition of heated effluent to the river.

I. IMPINGEMENT

Historically, massive fish kills have been recorded in the vicinity of power plant intake screens on the Hudson River. The fish appear to die when impinged on the screens by water being withdrawn by the plant for cooling. At Indian Point Unit No. 1 conservative estimates of 1.5 million impinged fish per year indicate the magnitude of this problem. Although preliminary testing indicates that bubble screens may reduce the number of fish destroyed in this manner, the proposed operation of Unit 3 will triple this number. Preliminary testing of Unit 2 in 1972 resulted in the destruction of at least 130,000 fish in only four

days before it was shut down by order of the State. And that plant was operating at only 50% of capacity! Utilizing 1.5 million fish impinged per year at Units 1 as a means of calculation, the three Indian Point plants would kill 10.5 million fish per year, at least 5% of which would be striped bass and the majority of the remainder, white perch. Considering that the other power plants (Bowline, Roseton, etc.) on the Hudson River may also exert similar pressures on the fishery, significant adverse effects on species composition can be expected from fish kills by impingement.

## II. ENTRAINMENT

Fish biologists have become alarmed at the mortality of fish eggs and larvae when they are entrained in cooling water flow passing through a power plant. Reports and interpretation of various data indicate that 90-100% of those eggs and larvae so entrained are killed. The few that survive may be sufficiently damaged to cause excessive delayed mortality. Mathematical transport analysis of the Hudson River has indicated that Indian Point Unit 2 (and consequently Unit 3) could entrain up to 50% of the fish eggs and larvae that the striped bass spawn yearly. Other species of fish in the Hudson may be similarly affected.

### III. THERMAL EFFLUENT

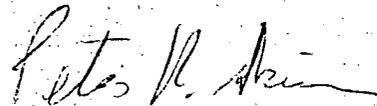
The discharge of thermally increased effluent to the Hudson River from the once-through-cooling system can cause disruption to aquatic systems so exposed. Fish eggs and larvae exhibit the most conservative heat tolerance, especially when exposed to the adverse environment existing in the power plant condensers. In addition to this direct effect on entrained organisms, Con Edison has not presented conclusive evidence to date that:

1. Fish will not be attracted to Indian Point by the increase in water temperature in the area.
2. Such fish will not at some later time suffer "cold shock", lose equilibrium, strength, etc. and become impinged.
3. Effluent from the plant in conjunction with the effluent from the Lovett Plant across the River, will not cause adverse migratory and reproductive perturbations for anadromous fish species.
4. That the applicant's mathematical and physical modeling effort can adequately predict continuous conformance with the New York State Thermal Criteria applicable to this estuary.
5. That the additional heat load to the river from the other power plants on the Hudson will not lead to thermal standard non-conformance at Indian Point.

IV. CON EDISON'S FIVE YEAR STUDY

Con Edison maintains that their "five year study" will detect any ecological disturbances traceable to the operations of the power plants at Indian Point. I can find no conclusive evidence supporting this claim, although a monitoring program should accompany any large installation utilizing the river water. My opinion coupled with testimony before the Atomic Safety and Licensing Board at Indian Point 2, indicates that this study has not been entirely based on verified mechanisms known to be affecting fish population dynamics in the Hudson River fishery. The result of this fault in the conceptual framework of the study will be the generation of inadequate data on too many factors under too many environmental conditions. Therefore, the information gathered by this "shot-gun" method when analysed will lack the predictive integrity necessary to justify the continued operation of once-through cooling.

For the foregoing reasons, it is my considered opinion that once-through cooling at Indian Point Unit 3 will substantially disrupt and damage the Hudson River ecosystem.



PETER N. SKINNER

Sworn to before me this  
20<sup>th</sup> day of April, 1973

  
Assistant Attorney General