

UNITED STATES OF AMERICA

ATOMIC ENERGY COMMISSION

In the Matter of)
)
CONSOLIDATED EDISON COMPANY) Docket No. 50-286
OF NEW YORK, INC.)
(Indian Point Station)
Unit No. 3))

AFFIDAVIT OF HARRY G. WOODBURY, JR.

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

HARRY G. WOODBURY, JR., being duly sworn, says:

1. I am an Executive Vice President of Consolidated Edison Company of New York, Inc. ("Consolidated Edison"). I make this affidavit in support of the document entitled "Motion for Fuel Loading, Subcritical, and Low Power Testing and Limited Operating License."

2. My responsibilities include; a) being the principal representative of the Company in environmental matters; b) keeping current with the state of the art, regulations, and legislation in the environmental area and translating these into Company environmental goals, policies, programs, and procedures; and c) directing biological and aesthetic investigations and research related to present or planned land, water, or air use. I have participated in the proceedings to date concerning environmental considerations relating to the applications of Consolidated Edison

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to operate Indian Point Units 2 and 3.

3. I am familiar with the activities Consolidated Edison proposes to conduct pursuant to the requested authorization to which this affidavit is attached, and with the potential environmental effects of those activities.

4. The impact on the aquatic ecosystem of the Hudson River resulting from the fuel loading, testing and limited operation of Indian Point Unit No. 3 ("Indian Point 3") in accordance with the requested authorization will be negligible.

Fuel Loading and Subcritical Testing

5. As discussed in the affidavit of Carl L. Newman, sworn to on July 19 , 1974, para. 8, ("Newman aff.") thermal discharges from Indian Point 3 during fuel loading and subcritical testing will be negligible. Such discharges in combination with those from Units 1 and 2 will comply with the New York State Water Quality Standards and will produce no significant or irreversible adverse effect on populations of aquatic life in the Hudson River (See Thermal Studies of NYU, Raytheon, et al.; Indian Point 3 Environmental Report, Appendix CC and Section 12.1).

6. Chemical discharge concentrations and dissolved oxygen changes from Indian Point 3 during fuel loading and subcritical testing, which are discussed in the Newman aff. para. 9, will,

whether alone or in combination with those from Units 1 and 2, be sufficiently low that no significant or irreversible adverse effect on populations of aquatic life in the Hudson River will occur. (See Bioassay Studies of Gift, Renwoldt, Lauer, Cristen, and Lamont-Doherty; Indian Point 3 Environmental Report, Appendix Z and Section 12.1)

7. Although the six circulating water pumps (total capacity 840,000 gpm) at Indian Point 3 may be operated periodically for such reasons as biological, mechanical or electrical tests, they are not needed and will not be operated for purposes of fuel loading. During subcritical testing no more than three if any, circulating water pumps will be in operation simultaneously. When river water temperature is below 40°F these pumps will be operated at 60% of rated flow (total flow including service water = 282,000 gpm). This is subject to the availability of the recirculation loops due to be installed before the end of 1974. When river water temperature is above 40°F these pump may be operated at 100% of rated flow (total flow, including service water = 450,000 gpm). During these activities it is estimated that the highest numbers of fish expected to be impinged at Indian Point 3 when pumps are operating will be approximately 170 fish per day in November, 450 fish per day in December and 2900 fish per day in January. The majority of these fish will be young of the year white perch. These estimates are based upon impingement data at Indian Point 2 during the winter of 1973-74 and the assumption

that three circulators at reduced flow will be used. If these circulators are used intermittently or not at all, fewer fish than the above estimates can be expected to be impinged since only the service water system (capacity = 30,000 gpm) would then be in operation. It should also be noted that it is possible that improved intake design at Indian Point 3, with travelling screens at the front of the intake bays will result in fewer fish impinged than these estimates based on Unit 2 data, and improved survival of those fish that are impinged. As was done in the case of impingement predictions for Indian Point 2 (Alevras on Fish Impingement at Indian Point 1 and 2; February 5, 1973; Docket 50-247), a 25% upward adjustment factor has been applied to the Unit 2 data to account for fish lost from the air curtain and sampling techniques. Because of the short duration of the fuel loading and subcritical testing period (approximately 11 weeks) it is concluded that no significant or irreversible adverse impact on Hudson River fish populations will result from fish impingement associated with these activities.

8. During the time period scheduled for these activities, there will be relatively few organisms available for entrainment (as compared with the warmer months). The only important species (in terms of abundance) susceptible to entrainment during this period will be the macrozooplankters Gammarus and Monoculodes, and tests at Indian Point 1 and 2 indicate negligible adverse

impact on these species during such entrainment. No important fish species will be susceptible to entrainment during this period. Because of the low intake flow, low abundance of entrainable organisms, and short duration of the fuel loading and subcritical testing period, it is concluded that no significant or irreversible adverse impact on populations of aquatic biota in the Hudson River will result from entrainment associated with these activities.

Initial Criticality and Low Power Testing to 10% of Rated Power

9. Thermal discharges from Indian Point 3, during these activities, which are discussed in the Newman aff., para. 12, in conjunction with thermal discharges from Units 1 and 2 will comply with the New York State Water Quality Standards, and will result in no significant or irreversible adverse impact on the populations of aquatic biota of the Hudson River. (See Thermal Studies of NYU, Raytheon, et al.; Indian Point 3 Environmental Report, Appendix CC and Section 12.1)

10. Chemical discharge concentrations and dissolved oxygen changes from Indian Point 3 during initial criticality and low power testing to 10% of rated power, which are also discussed in the Newman aff., para. 13, will, whether alone or in combination with those from Units 1 and 2, be sufficiently low that no significant or irreversible adverse effect on populations of aquatic life in the Hudson River will occur. (See Bioassay

Studies of Gift, Renwoldt, Lauer, Cristen and Lamont-Doherty;
Indian Point 3 Environmental Report, Appendix Z, and Section 12.1)

11. During initial criticality and low power testing to 10% of rated power, three of the circulating water pumps normally will be operated simultaneously. When the river water temperature is below 40°F these pumps will be operated at 60% of full flow (total flow, including service water = 282,000 gpm). When the river water temperature is above 40°F these pumps may be operated at 100% of full flow (total flow, including service water = 450,000 gpm). During these activities, it is conservatively estimated that approximately 2900 fish per day during January, and 3700 fish per day during February, will be impinged at Indian Point 3. The majority of these impinged fish are expected to be young of the year white perch. These estimates are based upon impingement data at Indian Point 2 during 1974 (with a 25% adjustment for lost fish) and the assumption that during the period of these activities three circulators at reduced flow will be used. Because of the short duration of the initial criticality and low power testing to 10% of rated power (approximately 3 weeks), it is concluded that no significant or irreversible adverse impact on Hudson River fish populations will result from fish impingement associated with these activities.

12. During initial criticality and low power testing up to 10% of rated power, probably the only important species, in terms of abundance, which are susceptible to entrainment will be the macrozooplankters Gammarus and Monoculodes, and Tomcod, a winter-spawning fish. Because of the abundant populations of these species in the river, and the short duration of these activities (approximately 3 weeks), it is concluded that no significant or irreversible adverse impact on the balance of aquatic biota in the Hudson River will result from entrainment at Indian Point 3 during these activities.

Testing to 50% of Rated Power

13. Thermal Discharges from Indian Point 3 during these activities which are discussed in the Newman aff., para 15-17, in conjunction with thermal discharges from Units 1 and 2 will comply with the New York State Water Quality Standards, and will result in no significant or irreversible adverse impact on the populations of aquatic biota of the Hudson River. (See Thermal Studies of NYU, Raytheon, et al; Indian Point 3 Environmental Report, Appendix CC, and Section 12.1)

14. Chemical discharge concentrations and dissolved oxygen changes from Indian Point 3 during testing to 50% of rated power, which are discussed in the Newman aff., para. 18, will, whether alone or in combination with those from Units 1 and 2, be sufficiently low that no significant or irreversible adverse effect on populations of aquatic life in the Hudson River will

occur. (See Bioassay Studies of Gift, Renwoldt, Lauer, Cristen and Lamont-Doherty; Indian Point 3 Environmental Report, Appendix Z, and Section 12.1)

15. During testing up to 50% of rated power, at least three of the circulating water pumps will be operated simultaneously. When the river water temperature is below 40°F these pumps will be operated at 60% of full flow (total flow, three circulating water pumps plus service water = 282,000 gpm). When the river water temperature is above 40°F these pumps may be operated at 100% of full flow (total flow three circulating water pumps plus service water = 450,000 gpm). As power levels approach 50% of full power, it will become necessary to operate up to six circulating water pumps. In this case, when the river water temperature is below 40°F, these pumps will be operated at 60% of full flow (total flow including service water = 534,000 gpm). When the river water temperature is above 40°F, these pumps may be operated at 100% of full flow (total flow, including service water = 870,000 gpm). During testing to 50% of rated power, it is estimated that 3700-6900 fish per day in February and 1900-3600 fish per day in March will be impinged at Indian Point 3. The range of these estimates reflects the variation between operating with three or six circulating water pumps. The majority of these impinged fish will be young of the year white perch. These estimates are based upon impingement data at Indian Point 2 during 1974 (with a 25%

adjustment for lost fish) and the assumption that three to six circulating water pumps running at reduced flow will be operated at Unit 3. Because of the abundance of fish in the river and the short duration of the period of testing to 50% of rated power (approximately four weeks), it is concluded that no significant or irreversible adverse impact on Hudson River fish populations will result from fish impingement associated with these activities.

16. During the period of testing up to 50% of rated power the only important species susceptible to entrainment will be the macrozooplankters Gammarus and Monoculodes, and Tomcod, a winter-spawning fish. Because of the short duration of testing to 50% of rated power (approximately four weeks), it is concluded that no significant or irreversible adverse impact on the balance of aquatic biota in the Hudson River will result from entrainment at Indian Point 3 during these activities.

Testing to 91% of rated power

17. Thermal discharges from Indian Point 3 during these activities, which are discussed in the Newman aff., para. 5-17, in conjunction with those from Units 1 and 2 will comply with the New York State Water Quality Standards, and will result in no significant or irreversible adverse impact on the populations of aquatic life in the Hudson River. (See Thermal

Studies of NYU, Raytheon, et al; Indian Point 3 Environmental Report, Appendix CC and Section 12.1)

18. Chemical discharge concentrations and dissolved oxygen changes from Indian Point 3 during testing to 91% of rated power, which are discussed in the Newman aff., para. 18, will, whether alone or in combination with those from Units 1 and 2, be sufficiently low that no significant or irreversible adverse effect on populations of aquatic life in the Hudson River will occur. (See Bioassay Studies of Gift, Renwoldt, Lauer, Cristen and Lamont-Doherty; Indian Point 3 Environmental Report, Appendix Z and Section 12.1)

19. During testing from 50% to 91% of rated power all six of the circulating water pumps normally will be operated. When the river water temperature is below 40°F those pumps will be operated at 60% of full flow (total flow, including service water = 534,000 gpm). When the river water temperature is above 40°F these pumps may be operated at 100% of full flow (total flow, including service water = 870,000 gpm). During testing up to 91% of rated power it is estimated that approximately 3600 fish per day in March and 5000 fish per day in April will be impinged at Indian Point 3. The majority of these impinged fish will be young of the year white perch. These estimates are based upon impingement data at Indian Point 2 during 1974 (with a 25% adjustment for lost fish) and the assumption that the six circulators will be operated at 60%

of full flow during the period of this activity. Because of the short duration of the testing to 91% of rated power period (approximately 6 weeks), it is concluded that no significant or irreversible adverse impact on Hudson River fish populations will result from impingement at Indian Point 3 during this activity.

20. During the period of testing up to 91% of rated power, the only important species (in terms of abundance) susceptible to entrainment will be the macrozooplankters Gammarus and Monoculodes, and Tomcod, a winter-spawning fish. Because of the abundant populations of these species in the river, the short duration of the testing to 91% of rated power (approximately 6 weeks), and the negligible effect of entrainment on Gammarus and Monoculodes (N.Y.U. Progress Report for 1971-72; Docket 50-286) it is concluded that no significant or irreversible adverse impact on populations of aquatic life in the Hudson will result from entrainment at Indian Point 3 during this activity.

Limited Operation at Up to 91% of Rated Power

21. Thermal discharges from Indian Point 3 during these activities, which are discussed in the Newman aff., para. 15-17 in conjunction with thermal discharges from Unit 1 and 2 will comply with the New York State Water Quality Standards, and will result in no significant or irreversible adverse impact

on the populations of aquatic biota of the Hudson River.

(See Thermal Studies of NYU, Raytheon et al; Indian Point 3 Environmental Report, Appendix CC and Section 12.1)

22. Chemical discharge concentrations and dissolved oxygen changes from Indian Point 3 during limited operation at up to 91% of rated power, which are discussed in the Newman aff., para. 18, will, whether alone or in combination with those from Units 1 and 2, be sufficiently low that no significant or irreversible adverse effect on populations of aquatic life in the Hudson River will occur. (See Bioassay studies of Gift, Renwoldt, Lauer, Cristen and Lamont-Doherty; Indian Point 3 Environmental Report, Appendix Z, and Section 12.1)

23. During the requested year of limited operation at Indian Point 3 it is estimated that approximately 1.1 million fish, weighing approximately 12,300 pounds, will be collected on the intake screens of Indian Point 3. An additional 1.5 million fish weighing approximately 16,300 pounds are expected to be collected on the intake screens at Units 1 and 2 for a total of 2.6 million fish weighing approximately 28,600 pounds at all three units. The majority of these fish will be young of the year, approximately 2-4 inches in length, who have not entered the reproduction stage of their life. Of these fish, approximately 71% are expected to be white perch, 13% herring, 8% tomcod, 3% striped bass, 2% bay anchovy, and 3% all other species. Highest numbers of

fish will be collected during the winter months (November - March). White perch are expected to comprise more than 90% of the catch during the winter and early spring. Tomcod will frequently be collected from late spring through early fall. Bay anchovy will be abundant in summer and fall. Herring will be numerous in the fall. Striped bass will be a small percentage of the catch throughout the year.

Ecologically, the biomass of fish removed from the immediate area of the plant through impingement is much more relevant than impact based on removal of individual fish. Estuaries are very productive areas, and sustained fishery production of 50 pounds per acre in the Gulf of Mexico and 155 pounds per acre in the Chesapeake Bay and its estuarine tributaries have been reported. If the extreme assumption is made that all fish impinged at Indian Point come from the 4 square miles of river in the immediate area, an annual removal of 11.2 lbs/acre for all species combined can be calculated for operation of all three units at Indian Point. When compared to the minimum estimates of fish biomass in estuaries mentioned previously, these postulated removals are insignificant. When it is further considered that the removals almost certainly come from an area larger than the 4 square miles, and hence the poundage removal per acre of estuary is even less than the figures given, the significance of mortality by impingement is reduced still further. (Indian Point Environmental Report, Appendix BB, and

Section 12.1)

24. During the requested year of limited operation of Indian Point 3, numerous species of bacteria, phytoplankton, zooplankton, and fish eggs and larvae will be entrained in the plant's cooling water system. With respect to bacteria, phytoplankton, and zooplankton, studies by Dr. Gerald Lauer of NYU indicate that the limited operation of Indian Point 3 will result in no significant or irreversible adverse impact on populations of these organisms in the Hudson River. With respect to fish eggs and larvae, a mathematical model developed by Quirk, Lawler and Matusky Engineers and found by the Indian Point Unit 2 Atomic Safety and Licensing Appeal Board, to be closer to reality than the AEC Staff Model (ALAB-188, RAI-74-4, 323, 383; April 4, 1974) predicts that 10 years of simultaneous operation of Indian Point 2 and 3 will result in only a 6% reduction in the total striped bass population of the Hudson. (Indian Point 3 Environmental Report, Appendix AA, page 17). Furthermore, striped bass populations typically fluctuate in abundance over more than a four fold range and have substantial compensatory reserve (Testimony of Dr. James T. McFadden on Impact of Entrainment and Impingement at Indian Point Units 1 & 2 Upon Fish Populations, Oct. 30, 1972, Docket 50-247). In light of these facts, it is clear that the requested limited operation of Indian Point 3, which includes only one spawning season, will not result in a significant or

irreversible adverse impact on the striped bass populations of the Hudson. American shad, the other fish species of commercial importance in the Hudson River in addition to striped bass, spawns in the upper estuary, far above the plant. Studies by NYU in 1971 and 1972 showed no shad eggs in plankton samples at the Indian Point Plant. (NYU Progress Report for 1971-1972; Docket 50-286). Therefore it is concluded that entrainment at Indian Point 3 during the requested limited operation will not result in a significant or irreversible adverse impact on shad populations of the Hudson River.

25. It is expected that Indian Point 2 will be shutdown for approximately 8 weeks during the winter of 1975-1976 for refueling. The effect of this shutdown will be to reduce the total impact of the Indian Point Station on the Hudson River ecosystem during that period.

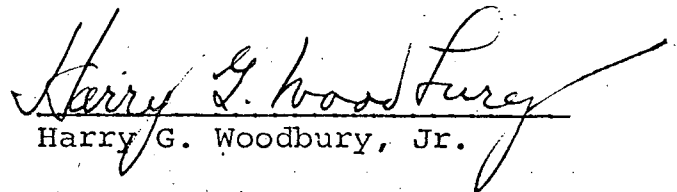
Effects of Schedule Changes

26. The environmental impacts described above are based upon the schedule of activities discussed in the affidavit of Mr. William J. Cahill, Jr., sworn to on July 19, 1974. It is possible that delays in performing these activities may develop at some future date. If such delays occur the overall environmental impact of the requested activities through May 1, 1976 will be no greater than described above for the case where the activities are performed on schedule.

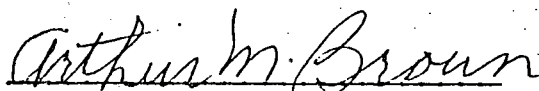
Benefit Cost Analysis

27. In summary, the total adverse biological impact of the requested fuel loading, subcritical testing, initial criticality, testing at up to 91% of rated power and limited operation at 91% of rated power at Indian Point 3 to May 1, 1976 will be at most a very small, short-term reduction in a single year class of the affected fish populations of the Hudson River. These reductions will be neither significant nor irreversible.

28. In contrast, the benefits of this proposed action will be substantial as pointed out in the affidavits of Mr. Carl L. Newman and Mr. Bertram Schwartz, sworn to on July 19, 1974. These benefits include reduced particulate, SO₂, and NO_x emissions by using nuclear rather than fossil fueled plants, increased system reserve and reliability, reduced dependence on fossil fuels, savings to customers in power costs, and provision for maintenance downtime needed at other plants.


Harry G. Woodbury, Jr.

Sworn to before me
on July 19, 1974


Notary Public

ARTHUR M. BROWN
No. 24-5470901
Notary Public State of New York
Qualified in Kings County
Commission Expires March 30, 1976