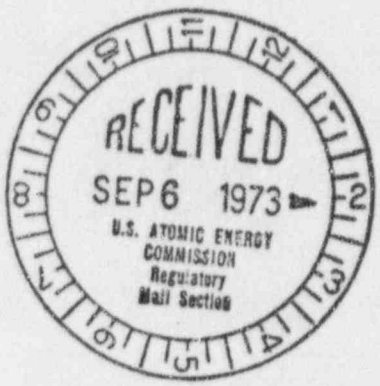
OFFICE OF THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

50-219

September 4, 1973



Mr. Daniel R. Muller
Assistant Director for
Environmental Projects
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Muller:

The draft environmental impact statement for the proposed Oyster Creek Nuclear Generating Station, Ocean County, New Jersey, which accompanied your letter of July 9, 1973, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

2. THE SITE

Section 2.7.2 Aquatic

Page 2-30. With regard to finfish in Barnegat Bay, it is stated that the majority have demersal eggs, which would be less susceptible to entrainment. The natural depth of the bay and the artificially induced current patterns of the intake/discharge system indicate, however, that demersal eggs could be swept from the Bay bottom and entrained in the cooling water. This possibility should be discussed, including a comparison of the susceptibility to entrainment and the ultimate fate of the eggs of various species of fish that pass through the condensers and down the effluent canal.

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4. ENVIRONMENTAL EFFECTS OF SITE PREPARATION AND TRANSMISSION FACILITIES CONSTRUCTION

Section 4.3.2 Aquatic

Page 4-4, paragraph 4. With reference to the impact on the hydrographic situation caused by the widening and deepening of the lower reaches of both streams and by the currents produced by station pumping, the environmental statement should point out that low velocity and oscillating tidal action are not so important to migratory finfish as the lack of an estuarine mixing zone of saline and fresh water. It is within this mixing zone that acclimatization from fresh to saline water or from saline to fresh water occurs. The final statement should acknowledge that the disappearance of this zone has placed a severe limitation on the usability by migratory finfish of both Oyster Creek and the South Branch of Forked River.

Page 4-4, paragraph 5. Regarding the 45 acres of wetlands that previous spoiling has removed from production, the final statement should discuss the feasibility of mitigating this loss and stabilizing the shoreline by transplanting plugs of saltmarsh vegetation along the canal and in those places still affected by tidal action. Transplanting of this vegetation would be especially effective if these grasses were used in conjunction with the recommended riprapping of the canal banks.

5. ENVIRONMENTAL EFFECTS OF OPERATION OF THE PLANT AND TRANSMISSION FACILITIES

Section 5.2.1 Impact of Release of Heat to the Bay

Page 5.2. This section should be expanded to include a full description of the thermal plume, including its size, mixing area, and contact area with the bottom. To state that the shape of the plume is "an approximate three-leaf clover pointed toward the inlet" provides little information of value to others who attempt to assess the impact of the plume on aquatic life.

Page 5-3, paragraph 2. The Staff concludes that one portion of the plume appears to "rather constantly" be recycled through the plant. It would be helpful if additional information could be provided, including an estimate of the proportion of the total flow that is recycled and a definition for the phrase "rather constantly."

Section 5.2.2.4 Staff Conclusions

Page 5-5, paragraph 4. We agree with the Staff that riprapping (see comment for page 4-4, paragraph 5) should be utilized to reduce canal erosion and silting. However, because operation of the dilution system at full capacity might prove to be destructive, we recommend that the option of back-fitting for some type of closed-cycle cooling system be retained as a possible alternative if the on-going studies indicate that continued operation with once-through cooling is creating a cumulatively considerable adverse impact on the aquatic environment.

Section 5.5.2.2. Entrapment on Intake Screens

Page 5-18. That the loss of 32,000 crabs/yr and 24,000 winter flounder/yr is significant, as stated, leads to the conclusion that various alternatives to the present plant design or method of operation should be investigated and perhaps utilized to mitigate such losses in the future. Although dilution will reduce temperatures in the discharge area, it will increase the intake velocity and water vdume handled by the pumping units. This increased flow will probably result in additional entrainment and impingement of marine organisms. The high probability that the resulting adverse impact would be compounded by the fact that the dilution system would be functioning during peak spawning, nursery, and utilization periods of marine organisms in the area should be discussed in the final statement.

Section 5.5.2.3 Effects of Passage Through the Condenser Structure

Page 5-20. The lack of onsite results should be corrected with the release of Rutgers Progress Report No. 8, and its data should form the basis for a discus' ' ı of the number and mortality levels of fish eggs and larvae passing through the system, especially during the peak spawning periods.

Section 5.5.2.4 Plume Effects

Page 5-23. With regard to the impact on aquatic productivity caused by operation of the Oyster Creek Station, we disagree with the Staff's opinion that "If the outfall temperature is kept below 87°F . the decrease would approach zero and have essentially no effect on the bay in terms of decreased production." This statement should be qualified to take into account the avoidance ability of mature finfish and the reduction of benthic flora and fauna due to the presence of "unnatural temperatures during the growing season.

Page 5-28. Studies of finfish entrained in thermal plumes have indicated that starvation is caused primarily by a natural reduction in available food supplies during the colder months. In view of this potential problem, especially with regard to the recent shutdown-induced fish kills at the plant, we concur with the Staff in requesting implementation of controls and operating procedures to minimize or eliminate problems caused by attracting fish to the warm discharge area during the cold months.

6. ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS

Section 6.2.3 Ecology

Page 6-2. We concur with the desirability of the requested studies, and suggest including a statement to the effect that the results of these studies will be utilized as a basis for determing whether plant operation is significantly detrimental to the aquatic ecosystem and whether corrective action to mitigate or eliminate the detrimental effects will be required.

Section 6.2.4 Environmental Radiation

Page 6-3. The radiological monitoring program (Table 6.1) does not include aquatic vegetation or fish, although the State of New Jersey has been sampling eelgrass and algae (pages 6-6 to 6-8) but apparently not fish. Herbivorous and carnivorous fishes, as well as waterfowl and other consumers of aquatic life, should be sampled.

8. IMPLICATIONS OF THE PROJECT

Section 8.6 Irreversible and Irretrievable Commitments of Resources

Page 8-18, paragraph 3. We believe that the significant detrimental effects being caused by the plant in its present design warrant initiation of corrective measures prior to granting of the full-term operatin license. If the use of the dilution system increases the impingement and entrainment problems, then feasible alternatives such as employing some type of screen system at the mouth of the intake canal or back-fitting of the plant for closed-cycle cooling should be implemented. We suggest that the discussion in this section should be expanded to prepare the applicant for possible re-evaluation of the plant's design.

9. ALTERNATIVES TO THE PROJECT

Section 9.2 1.1. Dilution

Pages 9-8 to 9-10. Although the use of dilution pumps could reduce plume problems, additional problems could be created in the intake

canal. These problems include increased entrainment and impingement of aquatic organisms due to increased velocities in the intake canal. During those periods when all three dilution pumps are operating, the plant's intake needs will exceed 2,700 cfs, a velocity that is more than double the existing needs. This doubling of intake velocity can be related to velocity in the intake canal, resulting in theoretical values in excess of 4.0 fps. Such velocities could cause bottom scour and entrainment affecting large areas of the bay, resulting in mechanical and biological problems related to increased silt loads, increased recycling of the heated discharge plume, and diminished numbers of marine organisms in a wider area because of entrainment in the intake flow. It is probable that placing by-pass systems or screening and return systems at the mouth of the intake canal would reduce the macro-biological entrainment load but that little could be done to reduce the micro-biological load that will be affected by the increased intake of water due to operation of the dilution pumps.

Sections 9.2.1.3, 9.2.1.4, and 9.2.1.5 Natural Draft Saltwater Cooling Tower, Natural Draft Hyperbolic Cooling Tower Using Toms River Makeup Water and Natural Draft Hyperbolic Cooling Tower With Sewage Plant Effluent Makeup Water.

Page 9-13 to 9-19. The feasibility of utilizing cooling tower designs with smaller approaches than 23°F and increasing the water velocity across the condensers to obtain reductions in the theoretical losses of efficiency should be discussed.

It should also be noted in the final statement that with a decrease in intake volume and velocity, the more motile species would be better able to avoid entrainment in the system. The figures presented in Table 9.8 are extrapolations based on the existing flow rate rather than on a combination of reduced flow velocities and volumes. This deficiency should be corrected in the final statement.

Additionally, the discussion of the increase in man-rem/yr with closed-cycle cooling should be expanded to include the possibility of reducing this level of exposure through methods other than dilution.

Finally, we feel that an environmental impact statement should fully assess all possible environmental impacts of an action and rigorously explore all the various avenues of alternative action regardless of economic cost. It would appear that the various alternatives to once-through cooling have been dismissed, in the final evaluation, as undesirable due to the economic cost of their implementation. In view of the fact that (1) Barnegat Bay is too shallow for optimum heat

dispersion with the existing discharge system and is unable to discharge its total waste heat load to the atmosphere, (2) several large fish kills have occurred in the past, and (3) Unit 1 of the Forked River Nuclear Station proposes to use a hyperbolic natural draft cooling tower at this same site to minimize the adverse effects of waste heat discharge on the aquatic environment, it would seem that a more complete evaluation of the environmental benefits of alternative closed-cycle cooling systems should be presented in the final statement.

Section 9.2.1.10 Alternative Intake Structures

Page 9-24. It seems to us that the second alternative of " . . . diverting fish toward the dilution pumps" would not greatly reduce fish enrapment losses. The description of these dilution pumps (page 3-8) does not mention screen systems other than trash racks. We therefore assume that fish could pass these racks, enter the pump intakes, pass through the pumps, and enter the discharge canal. Pressure changes, abrasion against pumps and impellers, and discharge into the thermally loaded cooling water could result in mortality levels similar to passage through the plant. We suggest this alternative and expanding this section with further discussion of alternative intake structures and screening systems.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Jersey Central Power & Light Company

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August 31, 1973

Mr. J. P. O'Reilly, Director
Directorate of Regulatory Operations, Region I
United States Atomic Energy Commission
970 Broad Street
Newark, New Jersey 07102

Dear Mr. O'Reilly:

Subject: Oyster Creek Station
Docket No. 50-219
Fish Mortalities

This letter is in response to a request received from your office for an information report regarding the August fish mortalities which occurred at Oyster Creek.

On the afternoon of August 9, 1973, while the Oyster Creek Nuclear Generating Station was operating at full load, a fish mortality occurred. (See "Chronology of Oyster Creek Fish Mortalities Events", attached.) Based on estimates of the fish that were seen on the surface of the Oyster Creek discharge canal, approximately 2,000 to 4,000 were killed. The cause of death is attributed to increased water temperatures resulting from the automatic shutdown of one of the plant's dilution pumps. These pumps take water from the bay via the intake canal and dilute the warm water exiting from the plant to reduce its temperature in the Oyster Creek discharge canal.

A Jersey Central Power & Light Company consulting biologist examined specimens of the dead fish and attributes their death to thermal shock resulting from the water temperature rise following the trip-off of the dilution pump. Although a second dilution pump was started within 30 minutes, it was not in time to prevent the fish mortality.

Company representatives notified appropriate state and federal agencies after the mortalities occurred. They continue to cooperate fully with State of New Jersey Fisheries' personnel who are investigating this event.

This is the first time since the plant went into operation in 1969 that a fish mortality has ever occurred during the summer months. Once in 1972 (January 29) and twice in 1973 (January 8 and February 16), fish mortalities were experienced, but only during the winter months as noted. It is not an unusual situation to shut down the dilution pumps during the summer months (June to August inclusive). An examination of plant records indicates that on at least five occasions, the plant operated during the summer months without dilution flow.

Water samples collected during this event have been analyzed. There was no detectable activity present above background, and chemical content of the water was typical for water in the area. The fish were analyzed for the presence of radioactivity and found to contain normal levels of ^{40}K, ^{60}Co, ^{134}Cs, ^{137}Cs. Thus, it can be concluded chemical impurities and/or radioactivity in no way were associated with the observed fish mortality.

In an effort to minimize the probability of a recurrence of this event, station operators have been advised to start another dilution pump immediately upon acknowledging a trip of the operating unit during the summer period. This will normally result in reestablishing dilution flow within 5 to 10 minutes.

Very truly yours,

Donald A. Ross

Donald A. Ross
Manager, Nuclear Generating Stations

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Attachment

CHRONOLOGY OF OYSTER CREEK FISH MORTALITIES EVENTS
AUGUST 9, 1973

Oyster Creek Nuclear Generating Station was operating at full load (630 MWe gross) during the entire time period spanned by this occurrence.

1400 Hours	Condenser inlet temperature - 80° F. Condenser outlet temperature - 102° F. Route #9 bridge over discharge canal - 92° F.
1415 Hours	No. 1 dilution pump tripped off automatically due to low water level switch actuation. The dilution trouble alarm was received in the control room. Plant operators went out to the dilution pump structure to investigate the cause of the alarm. An attempt was made to restart No. 1 pump, but was unsuccessful.
1444 Hours	No. 3 dilution pump was started.
1450 Hours	Bridge temperatures starting to increase.
1455 Hours	Plant instrument technician was working on an environs monitor at the Oyster Creek bridge when he noticed fish floating down towards him in the discharge canal. He immediately notified the appropriate members of the plant staff.
1500 Hours to 1530 Hours	Samples of dead fish and Oyster Creek discharge canal water collected for future examination and analysis.
1525 Hours	Bridge temperature reaches maximum at 99° F. and begins to decrease.
Approx. 1540 Hours	Bridge temperature returns to original level of 92° F.
1530 Hours to 1700 Hours	Notification of appropriate company, state, and federal personnel.