



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
WASHINGTON, D. C. 20240

IN REPLY REFER TO:

Mr. Harold L. Price
Director of Regulations
U. S. Atomic Energy Commission
Washington, D. C. 20545

SEP 26 1967

Dear Mr. Price:

This is in response to Mr. Boyd's letters of June 6 and July 26 requesting our comments on the application by the Metropolitan Edison Company for a construction permit and operating license for the proposed Three Mile Island Nuclear Power Station, Unit No. 1, Susquehanna River, Dauphin County, Pennsylvania, Docket No. 50-289.

The proposed plant would be located on Three Mile Island in the Susquehanna River about six miles south of Harrisburg, Pennsylvania, and approximately three miles upstream from the York Haven dam.

Principal features of the station would include a pressurized water reactor designed for an ultimate output of 2,535 thermal megawatts, a radioactive waste disposal system, and other on-site facilities required for a complete and operable nuclear power plant. Cooling water requirements would be provided for in three separate cooling systems: (1) a nuclear service system for all nuclear and fuel handling requirements, (2) a secondary system for all non-nuclear-related requirements, and (3) a condenser circulating water system for the main surface condenser and feedwater pump turbine condensers.

The condensers would be cooled with water circulated through two hyperbolic natural draft cooling towers. Makeup for tower evaporation, wind loss, and blowdown will be obtained from the secondary and nuclear services cooling systems. Water for the secondary and nuclear service coolers would be obtained from the river and after use be mixed with the condenser cooling water prior to entering the towers. Blowdown from the cooling towers would be discharged to the Susquehanna River and used to dilute the nuclear wastes. The intake structure would be provided with trash rakes, traveling screens, and a recirculating line from the condenser discharge to prevent icing.

The average discharge of the Susquehanna River at the Harrisburg gauge during the period 1890-1966 was 34,000 c.f.s. During this period the measured flows varied from a minimum of 1,600 c.f.s. during a freeze-up of the river to a maximum of 740,000 c.f.s. during flood conditions.

A valuable sport fishery exists within the project area which includes bluegill, crappies, walleye, yellow perch, bullheads, muskellunge, largemouth bass, smallmouth bass, and white perch. This fishery receives heavy fishing

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pressure and is one of the better fisheries occurring in the Susquehanna River. The Pennsylvania Fish Commission owns land along Conewago Creek in the vicinity of York Haven tailwater outlet which provides access and boat launching facilities.

Biological studies were conducted by the Fish and Wildlife Service in cooperation with the States of Pennsylvania, New York, and Maryland, from 1963 to 1966 to determine the suitability of the Susquehanna River and its principal tributaries for the restoration of runs of the anadromous American shad. It appears from the studies that much of the river is suitable and that there is a good possibility that American shad runs could be restored to the river.

The application indicates that the release of radioactive wastes would not exceed maximum permissible limits prescribed in Title 10, Part 20, of the Code of Federal Regulations. Although these limits refer to maximum levels of radioactivity that can occur in drinking water for man without resulting in any known harmful effects, operation within the limits may not always guarantee that fish and wildlife will be protected from adverse effects. If the concentration in the receiving water were the only consideration, maximum permissible limits would be adequate criteria for determining the safe rate of discharge. However, radioisotopes of many elements are concentrated and stored by organisms that require these elements for their normal metabolic activities. Some organisms concentrate and store radioisotopes of elements not normally required but which are chemically similar to elements essential for metabolism. In both cases, the radionuclides are transferred from one organism to another through various levels of the food chain just as are the nonradioactive elements. These transfers may result in further concentration of radionuclides and a wide dispersion from the project area particularly by migratory fish, mammals, and birds.

In view of the above, we believe that pre- and post-operational radiological surveys should be conducted by the applicant and include studies of the effects of radionuclides on selected organisms which require the waste elements or similar elements for metabolic activities. These surveys should be planned in cooperation with the Fish and Wildlife Service, the Federal Water Pollution Control Administration, the Pennsylvania Fish Commission, and the Pennsylvania Sanitary Water Board.

If it is determined from the pre-operational surveys that the release of radioactive effluent at levels permitted under Title 10, Part 20, Code of Federal Regulations, would result in harmful concentration of radioactivity in fish and wildlife, plans should be made to reduce the discharge of radioactivity to acceptable levels. Post-operational surveys should be conducted to evaluate the predictions based on the pre-operational surveys and to ensure that no unforeseen damage occurs.

In view of the importance of the present sport and commercial fisheries of the Susquehanna River and the future potential of runs of anadromous fish,

it is imperative that every possible effort be made to protect these valuable resources from radioactive contamination. Therefore, it is recommended that the Metropolitan Edison Company be required to:

1. Cooperate with the Fish and Wildlife Service, the Federal Water Pollution Control Administration, the Pennsylvania Fish Commission, the Pennsylvania Sanitary Water Board, and other interested State agencies in developing plans for radiological surveys.
2. Conduct or arrange for the conduct of pre-operational radiological surveys of selected organisms indigenous to the area that concentrate and store radioactive isotopes, and of the environment including water and sediment samples. These surveys should be conducted by scientists knowledgeable in the fish and wildlife field.
3. Prepare a report of the pre-operational radiological surveys and provide five copies to the Secretary of the Interior for evaluation prior to project operation.
4. Make modifications in project structures and operations to reduce the discharge of radioactive wastes to acceptable level if it is determined in the pre-operational or the post-operational surveys that the release of radioactive effluent permitted under Title 10, Part 20, Code of Federal Regulations, would result in harmful concentrations of radioactivity in fish and wildlife.
5. Conduct radiological surveys, similar to those specified in recommendation 2 above, analyze the data, and prepare and submit reports every three months during the first year of reactor operation and every six months thereafter or until it has been conclusively demonstrated that no significant adverse conditions exist. Submit five copies of these reports to the Secretary of the Interior for distribution to the appropriate State and Federal agencies for evaluation.

We understand it is the Commission's opinion that its regulatory authority over nuclear power plants involves only those hazards associated with radioactive materials. However, we recommend and urge that before the permit is issued, thermal pollution and any other detrimental effects to fish and wildlife which may result from plant construction and operation be called to the applicant's attention. We recommend further that the applicant be requested to discuss this matter with appropriate State conservation officials and the Fish and Wildlife Service and to develop measures to minimize these hazards.

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Although cooling towers have been planned for this plant, it is not stated in the application what the temperature of the effluent would be. Unless the temperature of the effluent is near the temperature of the receiving waters, there may be damage to aquatic life. Increased water temperatures may not only be detrimental to fish life directly but also may affect these resources indirectly through changes affecting the environment. Higher temperatures diminish the solubility of dissolved oxygen and thus decrease the availability of this essential gas. The elevated temperatures increase the metabolism, respiration and oxygen demand of fish and other aquatic life; hence the demand for oxygen is increased under conditions where the supply is lowered. Any thermal barriers that occur could adversely affect migration of anadromous fishes in the river. The thermal effects of this project should be appraised in combination with other proposed and existing nuclear and fossil fueled plants discharging these heated effluents into the same receiving waters.

In view of the above, we believe that, unless it is determined that the temperatures of the effluent would be near that of the receiving waters, ecological surveys should be conducted prior to and following plant operation to measure the effect of plant operation on aquatic life in the river. These surveys should be planned in cooperation with the appropriate Federal and State agencies. If it is determined from the pre-operational investigations that the heated water or chemical effluent from plant operation to be discharged into the river would result in changes in the environment that would be significantly detrimental to fish and wildlife, plans should be made to reduce the temperature of the effluent to acceptable levels. Post-operational surveys should be conducted to evaluate the predictions based on the pre-operational surveys and to ensure that no unforeseen damage occurs.

Another potential hazard to fishery resources in the river is the cooling water intake. Unless the intake is adequately screened, fish, fish eggs and larvae, plankton and other food organisms, may be drawn in and destroyed. The loss of a significant number of fish or food organisms to fulfill their needs at this point may prevent the successful re-establishment of anadromous fish to the river. Suitable fish protective facilities should be installed to prevent loss of fish through the intake structure.

In view of the Administration's policy to maintain, protect, and improve the quality of our environment and most particularly the water and air media, we request that the Commission urge the Metropolitan Edison Company to:

1. Cooperate with the Fish and Wildlife Service, the Federal Water Pollution Control Administration, the Pennsylvania Fish Commission, the Pennsylvania Sanitary Water Board, and other interested State agencies in developing plans

for ecological surveys, initiate these surveys at least two years before reactor operation, and continue them on a regular basis or until it has been conclusively demonstrated that no significant adverse conditions exist.

2. Meet with the above mentioned Federal and State agencies at frequent intervals to discuss new plans and to evaluate results of existing surveys.
3. Construct, operate, and maintain such fish protective facilities over the intake structures as needed to prevent significant damage to fishery resources.
4. Make such modifications in project structure and operation including additional facilities for cooling discharge waters as may be determined necessary as a result of the pre-operational or post-operational surveys to protect the fish and wildlife resources of the area.

The opportunity for presenting our views on this proposed project is appreciated.

Sincerely yours,

Clarence F. Pautzke
Clarence F. Pautzke
Commissioner

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