UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Boott Mills) Project No. 2790-004

Order Approving Instream Flow Study Plan

(Issued November 27, 1984)

Boott Mills and Proprietors of the Locks and Canals on Merrimack River (Licensee) filed on August 13, 1983, and supplemented on November 18, 1983, an instream flow study plan, and filed on November 16, 1983, and supplemented on December 8, 1983, the results of a fish study in a report entitled, "Instream Flow Demonstration." 1/ The plan and report were filed for Commission approval pursuant to Article 36 of the license for the Lowell Hydroelectric Project, FERC No. 2790-004, which is located at the Pawtucket Dam and the adjoining canal system on the Merrimack River in Middlesex County, Massachusetts. The project was licensed on April 13, 1983.

Article 36 required Licensee to file with the Commission, after consultation with resource agencies, an instream flow study plan (Flow Study) to determine the relationship between project discharges and downstream aquatic habitat, a fishery study plan (Fishery Study) to determine project discharges necessary to provide for the migration of anadromous fish in the reach of the Merrimack River between the dam and the powerhouse, and a schedule for completion.

Article 36 further required Licensee to conduct the approved Flow and Fishery Studies in accordance with the schedule, to file a report on the results of the studies, and, for Commission approval recommendations for project flow releases. Until completion of the Flow Study, Article 37 required Licensee to release an interim

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1/ Authority to act on this matter is delegated to the Director, Office of Hydropower Licensing, under §375.314 of the Commission's regulations, 49 Fed. Reg. 29,369 (1984) (Errata issued July 27, 1984) (to be codified at 18 C.F.R. §375.314). This order may be appealed to the Commission by any party within 30 days of its issuance pursuant to Rule 1902, 18 C.F.R. 385.1902, (1983). Filing an appeal and final Commission action on that appeal are prerequisites for filing an application for rehearing as provided in Section 313(a) of the Act. Filing an appeal does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically directed by the Commission.

continuous minimum flow of 905 cubic feet per second (cfs) from the project, which includes combined flows from the fish passage facilities, the powerhouse, the John Street Power Station, and leakage through the dam. Article 35, which is related to the requirements of Articles 36 and 37, required an operational study to determine the effectiveness of the fish passage facilities for anadromous fish migration.

Instream Flow Study

The Flow Study plan provides for the collection of physical and chemical data at one or more locations between the powerhouse discharge and the upper limit of the Essex Dam pool at project discharges of 905 cfs, proposed by the Licensee, and at 1,990 cfs, recommended by the U.S. Fish and Wildlife Service (FWS). The Licensee indicates that if substantial differences in velocity, depth, temperature, dissolved oxygen, and wetted perimeter are observed at these two discharge levels, intermediate discharge levels will be studied to determine the appropriate flow. Data will be interpreted with respect to habitat requirements for Atlantic salmon and American shad, as compiled by the Policy and Technical Committee for Anadromous Fishery Management of the Merrimack River. Habitat criteria for shortnose sturgeon will also be examined. The Flow Study plan was prepared after consultation with the fishery agencies and was approved by the Massachusetts Division of Fisheries and Wildlife (MDFW), and the National Marine Fisheries Service (NMFS). The FWS also believes the Flow Study plan to be adequate, provided that a range of flows is studied and dissolved oxygen levels are measured in the pools.

The Licensee states that the Flow Study will be conducted after the project comes on line, which is scheduled for the fall of 1985. The Licensee has reached an agreement with the MDFW, the FWS, and the NMFS to release from the powerhouse a flow of 1,990 cfs, or inflows, whichever is less, until such time as the Flow Study is conducted. Further, if the Licensee chooses not to perform the study, the Commission would be notified by the Licensee that the release of 1,990 cfs would be made indefinitely. The FWS recommends that if the Flow Study is postponed indefinitely beyond 1985, Article 37 should be changed to require an instantaneous flow release of 1,990 cfs.

The Flow Study, as proposed, would provide data from which the relationship between project discharges and downstream aquatic habitat can be determined. A specific schedule for completion of the Flow Study has not been provided. However, the Licensee has agreed to maintain a minimum flow of 1,990 cfs until the study is performed.

Fishery Study

The Licensee filed the results of a Fishery Study that was conducted prior to Commission approval of the study plan. The Fishery Study, developed and conducted after consultation with the state and Federal fishery agencies, was completed in September 1982. Depth and velocity measurements were obtained at several locations between the Pawtucket Dam and the Moody Street Bridge, at discharges from the dam of approximately 300 and 500 cfs. These releases represent the proposed discharges to be made during the night and during the day, respectively, during the peak 5 weeks of the American shad upstream migration season. The Licensee concludes that the results of the study are consistent with criteria for depth and velocity established for American shad by the FWS. The FWS states that, based on the study results, a final determination of the adequacy of the proposed 300 cfs (night) and 500 cfs (day) flow regime cannot be made until anadromous fish actually achieve passage under these conditions.

The Fishery Study as conducted in September, 1982, prior to issuance of the license, does not satisfy the requirements of Article 36. Further, neither velocity nor depth data were recorded in riffle areas during the study and thus, the criteria established by the FWS for shad passage in riffle areas were not assessed. Analysis of the study results does indicate that at discharge levels of 400 to 500 cfs, velocity appears adequate for shad passage at the location sampled with respect to the FWS criteria. However, the Licensee must assess the adequacy of the proposed flow regime while anadromous fish are present. This assessment must address depth, velocity and dissolved oxygen in riffles and pools and channel morphology between the powerhouse and the upstream fish passage facility at the dam.

Conclusion

Completion of the instream flow study will provide data on which a determination of an appropriate instream flow below the project can be based. Until such time as the Flow Study is conducted, an interim continuous minimum flow release of 1,990 cfs will adequately protect the fish and wildlife resources downstream of the project.

An assessment of the proposed flow regime for the migration of anadromous fish, conducted while anadromous fish are present, will permit the adequacy of the flow regime to be determined. On the basis of the record and Staff's independent analysis issuance of this order will not constitute a major Federal action significantly affecting the quality of the human environment.

It is Ordered that:

(A) The instream flow study plan, filed August 13, 1983, and supplemented on November 18, 1983, pursuant to Article 36 of the license issued for FERC Project No. 2790-004, is approved.

(B) Article 37 of the license for the Lowell Project is superseded by the following:

Article 37. The Licensee shall discharge from the Lowell Hydroelectric Project an interim continuous minimum flow of 1,990 cubic feet per second, as measured immediately downstream from the project, or the inflow to the reservoir, whichever is less, for the purpose of protecting fish and wildlife resources. The interim minimum flow may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the Massachusetts Division of Fisheries and Wildlife.

(C) Licensee shall, in cooperation with the Massachusetts Division of Fisheries and Wildlife, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service, assess the adequacy of the bypassed reach proposed flow regime (300 and 500 cubic feet per second during the night and during the day, respectively), to be released from the project dam for the migration of anadromous fish. The assessment shall be conducted in conjunction with the 2 year operational study to be initiated upon completion of the construction of the fish passage facilities, as required by Article 35. Results of the assessment and, for Commission approval, recommendations for flow releases for anadromous fish migration shall be filed with the Commission within 6 months following completion of the assessment. The Commission reserves the right, after notice and opportunity for hearing, to require additional studies or such reasonable changes in the project's fish passage facilities and operations as may be found necessary to maintain anadromous fish migrations past the project.

(D) This order is final unless a petition appealing it to the Commission is filed within 30 days from the date of its issuance, as provided in Section 385.1902 of the Commission's regulations, 18 C.F.R. 385.1902 (1983).

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