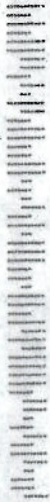


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Operations

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-2-

spillway flashboards or fish bypass configurations (e.g., obstructions) or emergency shutdowns; 5) identify spillway and downstream fish passage facility configurations at the Amoskeag dam for distributing water to the east and west channels of the Amoskeag bypass reach; 6) describe how the tailrace and bypass channel flows will be impacted when inflows are less than the sum of the permitted minimum tailrace and bypass channel flows described in section E-4 and E-5 of the 401 Certificate; and 7) provide a design and implementation schedule for all activities included in the operations plan.

Project No. 1893-053

Public Service Company of New Hampshire

ORDER APPROVING COMPREHENSIVE OPERATIONS AND COMPLIANCE  
MONITORING PLAN PURSUANT TO ARTICLE 405 AND CONDITION E-7 OF  
APPENDIX A

(Issued December 19, 2008)

On October 30, 2007, Public Service Company of New Hampshire (PSNH), licensee for the Merrimack River Project No. 1893, filed its Comprehensive Operations and Monitoring Plan as required by article 405 and condition E-7 of Appendix A of the project license dated May 18, 2007.<sup>1</sup> The Merrimack River Project is comprised of three developments, Amoskeag, Hooksett and Garvins Falls, and is located on the Merrimack River in Merrimack and Hillsborough Counties, New Hampshire.

#### BACKGROUND

License article 405 requires the licensee to file with the Commission, for approval, an operational compliance monitoring plan that includes: 1) the operations compliance monitoring requirements of condition E-7 of license Appendix A; and 2) procedures for complying with ramping rates, tailrace minimum flows, Amoskeag bypassed reach western channel minimum flows, and fish passage flows required by the project license.

Appendix A contains the requirements of the New Hampshire Department of Environmental Services (NHDES) Section 401 Water Quality Certificate issued on May 10, 2005. Condition E-7 requires the licensee to develop a run-of-river operations plan that shall: 1) define in detail, run-of-river operations, including, but not limited to, provisions for the maintenance of constant water levels in the impoundments and/or constant river flows downstream from project dams; 2) provide compliance monitoring, including reservoir levels, outflow, and if necessary, inflow, at the Garvins Falls, Hooksett, and Amoskeag developments unless otherwise approved by the NHDES; 3) describe the spillway and downstream fish bypass configurations, including design drawings, used to maintain the minimum flows in the bypass reaches described in Condition E-5 of the 401 Certificate; 4) describe contingency procedures to maintain minimum flows in the bypass reaches or tailraces during periods of failures of the

The plan is required to be submitted to the NHDES for review and approval by December 31, 2005, unless otherwise approved by the NHDES. The licensee is also required to develop the plan in consultation with the New Hampshire Fish and Game Department (NHFGD) and the U.S. Fish and Wildlife Service (FWS). The licensee will be required to implement the plan, excluding the construction of a new minimum river flow release structure, as soon as possible, but not later than 90 days after issuance of the new license for the project, unless otherwise approved by the NHDES.

In its plan filed with the Commission, the licensee is to include documentation of consultation with the requisite resource agencies, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. If the licensee does not adopt a recommendation, the filing should include the licensee's reasons, based on project-specific information.

#### LICENSEE'S PLAN

The licensee proposes to operate the Merrimack River project in an instantaneous run-of-river mode (ROR) by maintaining outflows from the three developments essentially equal to inflow at each development primarily with the use of a Pond Control System (PCS) that limits headpond fluctuations to  $\pm 0.125$  feet (ft). Headpond elevations will be continuously monitored to ensure ROR operation is being satisfied whenever river flows are at or below the hydraulic capacity of the generating stations. When river flows exceed the hydraulic capacity of the generating stations, excess flow will be spilled at the dam, thus continuing to ensure ROR operation.

Under limited circumstances, ROR operation may need to be modified temporarily and the licensee proposes to notify the Commission, NHDES, FWS and NHFGD prior to any temporary changes. The licensee also proposes to notify these agencies within 24 hours of any excursions to ROR operation due to emergencies.

<sup>1</sup> See 119 FERC ¶ 61,170



**Amoskeag development**

When river flows are within the hydraulic operating range of the three generating units (approximately 250 and 5,640 cubic feet per second - cfs), the PCS setpoint will be 0.05 ft above the top of flashboards (176.05 ft USGS). The objective is to maintain a pond level that is within  $\pm 0.125$  ft of this point. When river flow exceeds the maximum capacity of the units, excess flows will be spilled over the dam and the PCS will continue to monitor flows until they recede below the maximum capacity of the units. When river flows are below the minimum hydraulic capacity of one unit, the setpoint will remain at the top of flashboards. At times when flashboards are damaged or lost, an interim setpoint will be established based on board conditions in order to assure that required bypass flows are released and ROR operation is maintained.

A bypass flow of 280 cfs will be released into the eastern spillway bypass year-round. This flow will be provided by a gate structure that will be installed in 2008. Until the new gate is installed, the licensee proposes to notch nine linear feet of flashboards on the east side of the dam five-feet deep. In addition to the 280cfs bypass flow, a flow of 149 cfs will be provided to the western bypass during the downstream fish passage season via the downstream fish bypass (crest-gate). A flow of 58 cfs will be released through the crest gate during the non-fish passage season per Article 402. These flows will be provided by a two-foot gate setting and one-foot gate setting, respectively. The fish bypass gate will be checked daily for obstructions. During emergency maintenance of the gate there will be no bypass flows other than leakage, however, repairs will be undertaken as soon as possible in order to restore flows. If conditions arise that the gate is not operational for an extended period, the licensee will consult with the agencies to address fish passage and western bypass flow needs.

During a maintenance drawdown, a lowered headpond level will be the set point for ROR operation and the pond will be maintained within  $\pm 0.125$  ft of the lowered elevation. To protect aquatic habitat below the Amoskeag development whenever the impoundment is being refilled after a drawdown or when the project deviates from ROR operation, the project shall be returned to ROR operation at a maximum rate of change of 1,550 cfs per hour. A minimum flow of 1,427cfs will be released at all times except when inflow is less than the August median aquatic base flow (ABF). If inflow is less than the ABF, 90 percent of the inflow to the impoundment will be released downstream and 10 percent will be retained to refill the impoundment. These ratios can be modified after consultation with the resource agencies, if necessary. During emergency drawdowns, the licensee will notify the Commission and resource agencies within 24

hours of the incident and include the date, time, place and reason for emergency drawdown. The same ramping rates required for maintenance drawdowns will be applied.

**Hooksett development**

When river flows are within the hydraulic operating range of the single generating unit (approximately 725 and 1,750 cfs), the PCS setpoint will be 0.05 ft above the top of flashboards (189.05ft USGS). The objective is to maintain a pond level that is within  $\pm 0.125$  ft of this point. When river flow exceeds the maximum capacity of the unit, excess flows will be spilled over the dam and the PCS will continue to monitor flows until they recede below the maximum capacity of the unit. When river flows are below the minimum hydraulic capacity of one unit, the setpoint will remain at the top of flashboards. At times when flashboards are damaged or lost, an interim setpoint will be established based on board conditions in order to assure that required bypass flows are released and ROR operation is maintained.

A bypass flow of 64 cfs will be released into the western spillway bypass year-round. This flow will be provided by the removal of two flashboards (34 inches x 24 inches) and five notched flashboards (12 inches x 12 inches). During flashboards repairs and maintenance drawdowns when headpond is lowered to crest, no bypass flows will be provided. However, repairs will be undertaken as soon as possible in order to restore flows.

During a maintenance drawdown, a lowered headpond level will be the set point for ROR operation and the pond will be maintained within  $\pm 0.125$  ft of the lowered elevation. To protect aquatic habitat below the Hooksett development whenever the impoundment is being refilled after a drawdown or when the project deviates from ROR operation, the project shall be returned to ROR operation at a maximum rate of change of 1,550 cfs per hour. A minimum flow of 1,403cfs will be released at all times except when inflow is less than the August median aquatic base flow (ABF). If inflow is less than the ABF, 90 percent of the inflow to the impoundment will be released downstream and 10 percent will be retained to refill the impoundment. These ratios can be modified after consultation with the resource agencies, if necessary.

**Garvins Falls development**

When river flows are within the hydraulic operating range of the four generating units (approximately 330 and 6,380 cfs), the PCS setpoint will be 0.05 ft above the top of flashboards (219.875ft USGS). The objective is to maintain a pond level that is within



+0.125 ft of this point. When river flow exceeds the maximum capacity of the units, excess flows will be spilled over the dam and the PCS will continue to monitor flows until they recede below the maximum capacity of the units. When river flows are below the minimum hydraulic capacity of one unit, the PCS will be turned off, the unit will be taken off-line and river inflows will spill over the top of the flashboards. At times when flashboards are damaged or lost, an interim setpoint will be established based on board conditions in order to assure that required bypass flows are released and ROR operation is maintained. Units 3 and 4 (vertical, older turbines) will be used during periods during periods of low to moderate flow to maintain run of river. Units 1 and 2 (adjustable propeller, newer turbines) will be used during periods of moderate to high flow to maintain run of river.

A bypass flow of 55 cfs will be released into the spillway bypass year-round. This flow will be provided by the removal of one flashboard (69 inches x 36 inches) in the middle of the dam. During flashboards repairs and maintenance drawdowns, when headpond is lowered to crest, no bypass flows will be provided other than the flow below the fish bypass. However, repairs will be undertaken as soon as possible in order to restore flows. In addition to the 55 cfs spillway bypass flow, a flow of approximately 100 cfs into the canal fish bypass during the downstream fish passage season via the downstream fish bypass gate. A flow of 23 cfs will be released through this gate during the non-fish passage season. These flows will be provided by a five-foot gate setting and one-foot gate setting, respectively.

During a maintenance drawdown, a lowered headpond level will be the set point for ROR operation and the pond will be maintained within  $\pm 0.125$  ft of the lowered elevation. To protect aquatic habitat below the Garvins Falls development whenever the impoundment is being refilled after a drawdown or when the project deviates from ROR operation, the project shall be returned to ROR operation at a maximum rate of change of 1,377 cfs per hour. A minimum flow of 1,214 cfs will be released at all times except when inflow is less than the August median aquatic base flow (ABF). If inflow is less than ABF, 90 percent of the inflow to the impoundment will be released downstream and 10 percent will be retained to refill the impoundment. These ratios can be modified after consultation with the resource agencies, if necessary.

During emergency drawdowns, the licensee will notify the Commission and resource agencies within 24 hours of the incident and include the date, time, place and reason for emergency drawdown. The same ramping rates for required for maintenance drawdowns will be applied. Historically the licensee has drawn down the impoundments in anticipation of high river flows which may compromise the integrity of the project

flashboards. This will continue while the licensee annually reviews this practice in consultation with the resource agencies.

During unexpected station outages the licensee will attempt to mitigate impacts by providing spill at any available gate(s) and consulting with the resource agencies to protect river resources during significant interruption of ROR operations. During whitewater release events at Amoskeag, the licensee will implement one-hour holds before each unit is placed on-line or taken offline.

Finally, the licensee notes that the operations plan has already been implemented with the exception of the minimum flow release structure at Amoskeag, which should be completed by the fall of 2008.

#### CONSULTATION

The licensee sent its draft plan to the NHDES on December 22, 2005, as required in the Water Quality Certificate. The licensee then met with the resource agencies on July 10, 2007. A revised draft plan was sent on August 6, 2007, and upon receiving comments from FWS and NHDES, a revised plan was sent on August 17, 2007. The FWS accepted the licensee's plan by email communication dated August 22, 2007, and in a telephone conversation on September 19, 2007, the NHFGD concurred with the comments of NHDES and FWS. The NHDES accepted the plan by email communication dated December 10, 2007.

#### DISCUSSION AND CONCLUSION

The licensee's final plan was prepared in consultation with the state and federal resource agencies. The licensee revised the plan to adequately address all agency concerns. The licensee's final plan, though, should provide for notifying and reporting to the Commission should project operations deviate from operational requirements. With that addition, we find the final plan to be adequate and to meet the requirements of the license and it should be approved.

#### The Director orders:

- (A) The Comprehensive Operations and Compliance Monitoring plan, filed on October 30, 2007, is approved, as modified by ordering paragraph (B).
- (B) If project operations deviate from operational requirements, the licensee should file a report with the Commission within 30 days of the incident. The report shall,

to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall include, at a minimum: (1) any operational data necessary to determine compliance with Article 405 and Conditions E-7 of Appendix A; (2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the specific incident, the Commission reserves the right to require modifications to project facilities and operations in order to ensure future compliance.

(C) Unless otherwise directed in this order, the licensee shall file an original and seven copies of any filing required by this order with:

The Secretary  
Federal Energy Regulatory Commission  
Mail Code: DHAC, P1-12.3  
888 First Street, NE  
Washington, D.C. 20426

(D) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 CFR 385.713.



for George H. Taylor  
Chief, Biological Resources Branch  
Division of Hydropower Administration  
and Compliance