Kelley Falls Development and Management History

Development History

The original project construction was completed in 1916 by the Manchester Traction Light and Power Company, and ownership was later transferred to the Public Service Company of New Hampshire (PSNH). At that time the site was used to generate electricity primarily by steam. The use of the dam was limited to peaking power generation (500-kW generator) and as a supply of cooling water for the steam plant. The hydraulic capacity of the turbine was 720 cubic feet per second (cfs).

In the early 1970's, PSNH deactivated the hydroelectric project, which included removing the turbine from the powerhouse, and deactivated the steam station. In 1973, PSNH transferred ownership of the dam, powerhouse, flowage rights, etc. to the City of Manchester, who, in turn, gave the facility to the State of New Hampshire Water Resources Board (NHWRB). The NHWRB operated the dam from about 1973 to 1983, at which time it was leased to Hydro Resources Corporation (HRC) for the purpose of hydroelectric redevelopment. During this period the flow capacity of the penstock, with the turbine removed, was stated to be 800 cfs at normal pool level.

The FERC license for the rehabilitation of the hydroelectric facility was issued on April 24, 1984 to HRC. The project rehabilitation began in September 1984, and the plant began commercial operation by December 1985. The work involved modifying the existing powerhouse to accommodate the replacement turbine, installing new trash-racks, and repairing the penstock and intake structure. Soon after the commencement of commercial operations, mechanical problems developed in the turbine. A new turbine with a flow capacity of 420 cfs was installed in 1989 by the project licensee at that time, CHI Energy, Inc. who acquired the project in 1986. No significant changes have been made to the facility since 1989. The current project operator, ENEL North America, is a successor company of CHI Energy Inc.

Impoundment Management History

From 1916 until it deactivated the hydroelectric project in the early 1970's, PSNH maintained 36-inch-high seasonal flashboards on the dam from about May to November. The files indicate the pond level was generally maintained at top of the flashboards from early spring to fall as inflow would allow. There was no discussion relative to winter levels in the files reviewed. However, given the limited discharge capacity below the spillway crest it would be anticipated the pond would have been maintained at or above the spillway level for hydroelectric production.

The NHWRB operated the dam from about 1973 until 1983. Following a NHWRB sponsored public meeting on August 15, 1974 and at the request of the 207 landowners abutting the dam impoundment, it was decided that, beginning with the 1975 recreation season, 33-inch high flashboards would be erected on the dam following the spring

runoff, but no later than May 1, and would be removed on or about Columbus Day. There is some inference in the correspondence that a lower flashboard height had been put in place during the 1974 recreation season but the actual height could not be determined. From 1975 until 1983 the 33-inch-high flashboards were generally installed in May and removed by Columbus Day.

Following the leasing of the dam in 1983, the year-round use of the 33-inch-high flashboards was initiated and has continued to this day as part of the facility's FERC license agreement.

Current Operational Procedures

The project has a single 450-kW generation unit and operates in a run-of river mode in accordance with its FERC permit. The pond level is normally maintained at an elevation of 160.75 feet National Geodetic Vertical Datum (NGVD), which is at the top of the flashboards. The pond level is regulated by flows through the turbine (420 cfs at normal pond) and free flow over the 33-inch high spillway flashboards. A waste-gate (flow capacity of 100 cfs at normal pond level) at the east end of the spillway and a 42-inch diameter pipe (flow capacity of 80 cfs at normal pond level) at the west abutment can also be used to regulate pond levels at the project. This results in a total flow capacity through the dam at normal pond of 600 cfs.

During periods of high flows, the waste-gate is opened when the water level is between 161.25 to 161.75 feet NGVD, which is 6 to 12 inches above the top of the flashboards. The flashboards trip when the water level is between 162.25 to 162.75 feet NGVD, which is 18 to 24 inches over the top of the flashboards.