

**Final Application for New License for Major Water Power
Project – Existing Dam**

Northfield Project

Northfield Mountain Pumped Storage Project (FERC Project Number 2485)
Turners Falls Hydroelectric Project (FERC Project Number 1889)

**EXHIBIT C-CONSTRUCTION HISTORY AND PROPOSED
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The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 4.51 (d) describes the required content of this Exhibit.

(d) Exhibit C is a construction history and proposed construction schedule for the project. The construction history and schedules must contain:

(1) If the application is for an initial license, a tabulated chronology of construction for the existing projects structures and facilities described under paragraph (b) of this section (Exhibit A), specifying for each structure or facility, to the extent possible, the actual or approximate dates (approximate dates must be identified as such) of:

(i) Commencement and completion of construction or installation;

(ii) Commencement of commercial operation; and

(iii) Any additions or modifications other than routine maintenance; and

(2) If any new development is proposed, a proposed schedule describing the necessary work and specifying the intervals following issuance of a license when the work would be commenced and completed.

1 PROJECT HISTORY

FirstLight Hydro Generating Company (FirstLight) is licensed by the Federal Energy Regulatory Commission to operate the Northfield Project (Project).

Turners Falls Development

The Turners Falls Development is located on the Connecticut River in the states of Massachusetts (MA), New Hampshire (NH) and Vermont (VT). The greater portion of the Turners Falls Development, including developed facilities and most of the lands within the Project boundary, are located in Franklin County, MA; specifically, in the towns of Erving, Gill, Greenfield, Montague and Northfield. The northern reaches of the Project boundary extend into the town of Hinsdale, in Cheshire County, NH, and the town of Vernon, in Windham County, VT. The Turners Falls Dam is located at approximately river mile 122 (above Long Island Sound) on the Connecticut River, at coordinates 42°36'38.77" north and 72°33'05.76" west, in the towns of Gill and Montague, MA.

The Turners Falls Development currently consists of: a) two individual concrete gravity dams separated by an island; b) a gatehouse controlling flow to the power canal; c) the power canal and a short branch canal; d) two hydroelectric powerhouses, located on the power canal, known as Station No. 1 and Cabot Station; e) a bypassed section of the Connecticut River and f) a reservoir known as the Turners Falls Impoundment (TFI).

The original Turners Falls Dam and canal was constructed in the 1860s. Improvements to the dam and enlargement of the canal, as well as the construction of the Cabot Station and Station No. 1 powerhouses commenced in the early 1900s; Station No. 1 commenced operation in 1905, while the Cabot Station powerhouse commenced operation in 1915. In 1944, the Federal Power Commission, predecessor to the Federal Energy Regulatory Commission (FERC), issued to Western Massachusetts Electric Company a 50-year license for the Turners Falls Development designated as FERC No. 1889. The Turners Falls Development began operation with six vertical Francis turbines at Cabot Station with a capacity of 51 MW and six horizontal Francis turbines at Station No. 1 with a capacity of 6 MW.

To accommodate for the Northfield Mountain Pumped Storage Development, the Turners Falls license was amended by FERC in the same Order as the original license for the Northfield Project. This amendment approved the reconstruction of the Turners Falls Dam and Canal gatehouse. The completion of these improvements resulted in an increase in the permitted headpond level to elevation 185.0 ft mean sea level (msl). A subsequent license for the Turners Falls Project was issued by FERC in 1980.

Northfield Mountain Pumped Storage Development

The Northfield Mountain Pumped Storage Development is a pumped-storage facility located on the eastern bank of the Connecticut River in MA and is located approximately 5.2 miles upstream of Turners Falls Dam. The TFI serves as its lower reservoir. This Development's Upper Reservoir is a man-made structure situated atop Northfield Mountain, to the east of the Connecticut River. During pumping operations, water is pumped from the TFI to the Upper Reservoir. When generating, water is passed from the Upper Reservoir through an underground pressure shaft to a powerhouse cavern and then a tailrace tunnel delivers the water back to the TFI.

The Northfield Mountain Pumped Storage Development currently consists of: a) an Upper Reservoir and dam/dikes; b) an intake channel; c) pressure shaft; d) an underground powerhouse; and c) a tailrace tunnel. The TFI serves as the lower reservoir.

On May 14, 1968, the Federal Power Commission issued an original license to Connecticut Light and Power Company, Hartford Electric Company, and Western Massachusetts Electric Company for the

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construction of the proposed 1,000 MW Northfield Mountain Hydroelectric Project. The Project included four (4) 250 MW reversible pump-turbines. Construction of the Northfield Project began in 1968, and was completed when the first unit went into commercial operation in 1972.

The Project is maintained through regularly scheduled maintenance inspections and replacement of deficient equipment as necessary. In addition to the routine maintenance, various components of the Project have been refurbished. An overview of the history of Project improvements is summarized in [Table 1.0-1](#).

Table 1.0-1. Turners Falls Development and Northfield Mountain Pumped Storage Development Milestones.

Date	Location/Equipment	Description
<i>Turners Falls Development</i>		
1905	Turners Falls, Station No.1	Station No.1 - Generation Units began operation
1916	Turners Falls, Cabot Station	Cabot Station - Generation Units began operation 2/26/1916
1973	Turners Falls, Station No.1	Powerhouse deactivated
1982	Turners Falls, Station No.1	Units 1,2&3 refurbished, Powerhouse reactivated
1987	Turners Falls, Station No.1	Units 5&7 overhauled
1987	Turners Falls, Cabot Station	30 ton Gantry Crane replaced
1990	Turners Falls, Cabot Station	Control update to allow remote operation
1995	Turners Falls, Cabot Station	Control update to allow automated operation for Gatehouse and Canal
2002	Turners Falls, Cabot Unit 1-6	Generator step-up transformer upgraded
2002	Turners Falls, Cabot Unit 1&2	Turbine runner replacement and generator rewind
2003	Turners Falls, Cabot Unit 3&4	Turbine runner replacement and generator rewind
2004	Turners Falls, Cabot Unit 5&6	Turbine runner replacement and generator rewind
2006	Turners Falls, Cabot Station	Trashrack frames and supporting structure replaced
<i>Northfield Mountain Pumped Storage Development</i>		
1972	Northfield	First unit, Unit 4 began commercial operation 11/30/72
1973	Northfield	Units 1, 2, 3 began commercial operation; U1 02/28/73, U3 07/25/73, U2 10/08/73
2004	Northfield, Unit 1	Turbine runner and generator circuit breaker replacement
2006	Northfield, Unit 3	Electrical equipment replacement
2007	Northfield	1X Main power step-up Transformer replacement
2008	Northfield, Units 2 and 4	Electrical equipment replacement
2011	Northfield, Unit 3	Turbine runner and 3X Main power step-up Transformer replacement and generator rewind
2012	Northfield, Unit 2	Turbine runner replacement and generator rewind
2014	Northfield Unit 4	Turbine runner replacement and generator rewind
2015-16	Northfield Unit 1	Generator rewind

2 SCHEDULE FOR PROPOSED PROJECT DEVELOPMENT

As noted earlier in the Final License Application, the closure of the Vermont Yankee Nuclear facility (VY) during the relicensing study period resulted in delaying the aquatic and water quality studies one year. In FERC's February 21, 2014 study plan determination letter (Appendix C of that determination), it states that the aquatic and water studies reports should be filed by March 1, 2016, after the Draft License Application is to be filed. Given the delay in conducting the aquatic and water quality studies due to

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closure of VY in December 2014, coupled with FERC requiring two additional studies in 2016, FirstLight has not completed all of its scientific studies needed to support a full license application. Until these studies are complete, FirstLight is not proposing any new development at the Project. However, pending the magnitude of any future minimum flow release at the Turners Falls Dam, FirstLight will likely evaluate the feasibility of a minimum flow turbine generator at the dam.