

Memo to LIHI Board

RE: Vernon Project Recertification (LIHI #40)

The Technical Committee in its January 15, 2020 meeting voted to send the Vernon application to the full board for review and decision as allowed in the Technical Committee charter and bylaws.

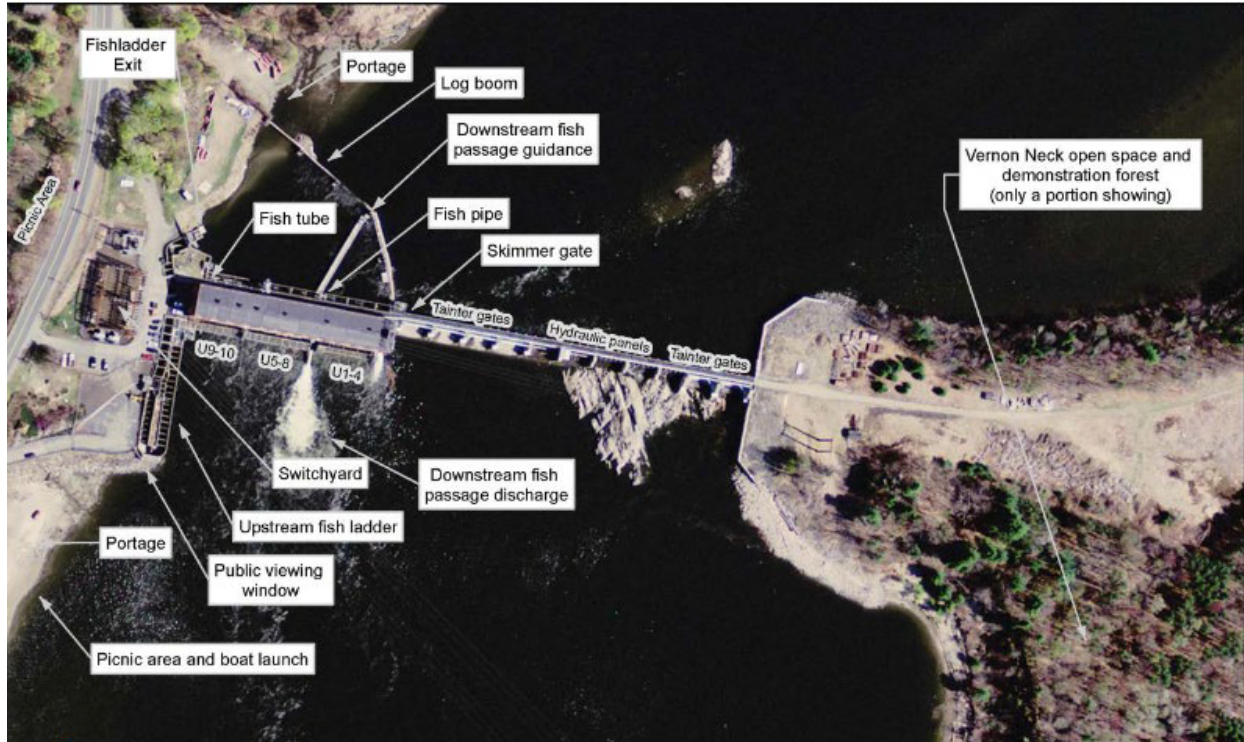
Project Summary:

- Project is located on the Connecticut River at Vernon VT/Hinsdale NH
- Originally constructed ~ 1909, 10 turbines - 4 turbines were repowered in 2008
- Peaking/storage project, 26-mile long impoundment
- Turner's Falls impoundment backwaters to the base of Vernon dam. Turner's Falls impoundment is also the lower reservoir for the Northfield Mountain pumped storage project. Both owned by First Light.
- First certified by LIHI in 2009, recertified 2014-2016
 - No changes in operations, except for fish passage improvements
 - No change in licensing status since 2016 recertification except new studies available for review
- Last relicensed in 1979, license amended in 2006 for repowering.
- In relicensing since October 2012; amended license application expected April, 2020; license possibly in 2022
- Several adverse application comments received (MDFW, USFWS, VANR, CRC, TNC)
 - 4 of 5 commented on flows, upstream and downstream fish passage
 - Least comments on water quality, cultural resources, recreational resources

Upper Connecticut River Dams

- The Connecticut River is highly regulated with 12 hydropower facilities on the river and 3 impoundments for flood control and storage.
 - Second CT Lake, First CT Lake (both owned by GRH), and Lake Francis/Murphy Dam (owned by NHDES) are all storage reservoirs (with no hydropower)
 - Flows in the river are dependent upon releases from those reservoirs along with tributary inflows (including releases from tributary Army Corps dams).
 - Moore and Comerford have seasonal storage
 - Flows into Wilder, Bellows Falls and Vernon are dependent on releases from Fifteen Mile Falls (LIHI #39) (all owned by GRH) and intervening tributary inflows.
 - Except for Fifteen-Mile Falls, projects upstream of Wilder are run of river and include Canaan (LIHI #160), Gilman (LIHI #108) and Dodge Falls (LIHI #42)
 - Wilder, Bellows, Vernon, and Turners Falls have weekly/daily storage in smaller quantities
 - Holyoke (LIHI #89) is essentially run of river. This is the first dam on the Connecticut River.
 - Along with Vernon, the Northfield Mountain, Turner's Falls, Wilder, and Bellows Falls are currently in FERC relicensing on a concurrent schedule with FERC conducting cumulative impacts analysis.

Vernon Project Features:



Criteria Evaluation

- 2 Zones of Effect – impoundment and tailwaters, no bypassed reach
- Standards selected are 1 - N/A - de minimis; or 2 - Agency Recommendation
- Measures in Place to meet LIHI Criteria:
 - **Flows:**
 - Minimum flow of 1250 cfs based on 0.2 cfs/m which reflected consensus of the majority of the agency recommendations at original licensing. Recent operating data shows flows meeting the highest original recommendation (1567) 95% of the time.
 - Flows originally set to offset temperature increases from Vermont Yankee nuclear plant cooling water discharge and to ensure healthy aquatic habitat as noted on this website (<https://www.martenlaw.com/newsletter/20100211-state-thermal-effluent-standards>) and also noted in the Vermont water quality standards (https://dec.vermont.gov/sites/dec/files/documents/wsmd_water_quality_standards_2016.pdf)

Note that Vermont Yankee has been decommissioned and no longer discharges into the CT River at the Vernon reservoir

- The current minimum flow is less than Summer ABF (0.5 csm) and Montana-Tennant's methodology of 2,700 cfs (Oct-Mar) and 5,400 cfs (Apr-Sept). It is higher than the 7Q10 flow of 888 cfs.
- The Turners Falls and Northfield Mountain operations fluctuate water levels at the base of Vernon Dam between 3 and 4 feet on a sub-weekly and sometimes sub-daily basis
- Habitat concerns also from sub-daily impoundment fluctuations. Vernon is allowed up to 8 ft fluctuations, however, normal operations use only the top 2 ft of that. The bottom 6 ft is only used in the following cases: to remove flashboards in order to pass high flow; during unusually low flow periods in order to provide the required min flow and; for emergency repairs
- Relicensing flow studies were conducted but as of yet, no clearly identified best operating regime or agency recommended minimum flow level that would best minimize impacts and support aquatic life and habitat. (As noted in the original LIHI Certification review, the optimum flow regime is likely best determined in the context of the multiple facilities on the Connecticut River and not at a single facility. As noted above, four facilities including Vernon are currently in relicensing.)
- Any new minimum flow or operating regime would be part of the new license. The agencies retained their ability to change the minimum flow at any time in the current license: *"Should this minimum flow release prove inadequate to protect the Connecticut River fishery, however, we may require higher flow releases under Article 12 or Article 15."* (from the Vernon FERC license, page 12)
- The license was amended in 2006 for the repowering and while not specifically opening flow requirements, agencies did provide an updated WQC, providing an opportunity to flex their Article 12 or Article 15 authority
- The project is in compliance with the current license. Based on current studies, agencies may have to set priorities for the optimization of the habitat since some species are demonstrating good health under the current regime, and others may benefit from a different regime
- **Water Quality:**
 - A 2012 water quality study required under license article 405 met standards. A 2015 study as part of relicensing also appears to meet standards. Based on these studies, LIHI considered the project having satisfied the Water Quality criteria
 - According to the 2nd edition handbook, WQC's must be less than 10 years old or have agency support to pass the B2 standard. Staff and Reviewer felt that having had authority to change the WQC under Article 12 or 15 of the license, having updated the WQC in 2006 as part of the license amendment, the project satisfies B2, agency recommendation. However, based on study results, the project also meets standard B3, site-specific monitoring studies.

- Stakeholders submitting comments to LIHI stated concerns about the project's potential impact on pH and temperature. No further information was received by LIHI nor has been thus far entered into the FERC record.
- NH and VT are expected to issue separate WQCs.
- **Upstream Passage:**
 - Fish ladder is designed for American shad and Atlantic salmon.
 - No American eel passage requirements under current license.
 - Current ladder also passes sea lamprey, eel and some resident species (bass, suckers, walleye, trout, sunfish).
 - Relicensing studies have been conducted on fishway effectiveness, and subsequent modifications were made. More modifications and effectiveness studies may be needed. Concerns expressed in comments include eel fallback & that fishway is operated only until July 15 while the eel passage season is thru mid-Nov.
 - Project is in compliance with current license and has made modifications to improve passage for eel which were not included in the current license
 - Studies for relicensing indicate that further improvements could be made but specific recommendations have not yet been made. Project owners have demonstrated willingness to make modifications in coordination with agencies in order to improve effectiveness.
- **Downstream Passage:**
 - Two downstream passage pipes for American salmon, American shad and blueback herring are installed;
 - No effectiveness studies required by current license.
 - Relicensing studies included passage (eel, adult shad, juvenile shad) and direct relative turbine survival and injury.
 - Additional modifications & studies likely to be needed to demonstrate/improve effectiveness.
 - Project is in compliance with current license; studies on effectiveness for multiple species are being reviewed by agencies; modifications will likely be required in the new license;
 - Project meets standard D2
- **Shoreline/Watershed:**
 - Only Erosion Control and Monitoring Plan required under current license.
 - Conducted erosion studies for relicensing which showed impoundment erosion, although direct causal factors not fully confirmed.
 - 223 of 287 acres fee-owned land set aside as undeveloped.

- Any future mitigation, including possible impact to protected species, would be part of new license.
- Project meets standard E2
- **T&E Species:**
 - Species present include federally listed Northern long-eared bat, and state listed species: bald eagle, pygmy weed in impoundment, cobblestone tiger beetle in far upper impoundment, Fowler's toad on Stebbins Island downstream of dam.
 - The extent of any impacts is currently under debate relative to flows. Decisions may need to be made on priority species. If any impacts are found significant enough to warrant mitigation, future operational changes may be required and would be reflected in the new license.
- **Cultural/Historic:**
 - The buildings and structures at Vernon are eligible for listing in the National Register of Historic Places as a Historic District.
 - There is an HPMP in place.
 - Conducted archaeological studies for relicensing.
 - NH SHPO concurs with no negative impacts, VT SHPO silent.
- **Recreation:**
 - Owned recreation facilities include a picnic area, boat launch and swimming area, canoe portage, open spaces, and boat-in camp sites.
 - Conducted relicensing recreation study. Additional facilities and increased maintenance at some current sites was noted as needed. Any future additions would be part of the new license.
 - GRH requested PLUS for recreation for 2 boat-in campsites. These do not rise to the level of PLUS requiring "significant new recreational opportunities" based on the overall size of project versus the amount of investment and number of facilities.
 - With condition, meets standard H-2, agency recommendation

Recommendation - Recertify for 5-year term with 3 conditions

(Note, staff acknowledge that the following condition 1 should be edited to redact staff activities.)

Condition #1 - The Vernon Project is undergoing re-licensing with an anticipated new license issued in 2022, and state WQCs prior to that date. LIHI Certification does not imply any judgment or recommendation on what the terms of a future FERC license or state WQC should be. If any of the following re-licensing actions occur within the next certification period, the facility owner shall notify LIHI within 60 days of their issuance. The actions include FERC issuance of their Notice of Acceptance and Ready for Environmental Analysis (REA) (the trigger for the 60-day period in which resource agencies issue their recommendations), issuance of a new license, WQCs, or Settlement Agreement. Upon notice of FERC's REA announcement, LIHI will monitor resource agency filings for review of their recommendations associated with LIHI Criteria. If the facility Owner executes one or more comprehensive Settlement Agreements (SA's) with stakeholders, receives one or both new state WQCs,

or receives a new FERC license before the end of the new LIHI Certification term, the facility Owner shall provide LIHI with notification of that fact within 60 days of the relevant issuance, and describe all differences between the previous requirements and new requirements under the new FERC license, new SA's, or new WQC conditions that are relevant to the LIHI Criteria. LIHI staff will review those differences, along with the resource agency issued recommendations, and decide whether the Project continues to meet the LIHI Criteria and whether any changes will be required to the current LIHI Certificate. LIHI reserves the right to modify the Certification pending results of the assessment.

Condition #2 – To better understand how to enhance upstream fish passage, the facility Owner, in consultation with applicable resource agencies, should temporarily extend the operational period of the fish ladder to better match the passage season for American eel for the next two passage seasons. This should be used as a test period to see if that extension results in substantially increasing the number of eels passing upstream. This extension should be incorporated with other physical improvements currently being tested. Research into alternative eel counting methods should also be performed within one year of this LIHI Certification, with the preferred alternative discussed with applicable resource agencies so that a method and its implementation schedule can be agreed upon.

(Per question received from TC: There are no provisions in the current license that would preclude the extension of the fish passage season.)

Condition #3 – The facility Owner shall remedy maintenance-level deficiencies of the Vernon Project recreational facilities based on Owner site visits, ILP Study 30 findings and consultation with CRC to obtain the maintenance needs at Owner-owned Vernon facilities identified by CRC in their 2018 survey. This consultation shall be completed within three months of LIHI Certification. The Owner shall implement these improvements by July 1, 2020, so the facilities are ready for the likely peak season use.