

OCCUM PROJECT
LIHI APPLICATION

ATTACHMENT A
FLOWS

Al Nash

From: Gephard, Steve [Steve.Gephard@ct.gov]
Sent: Friday, December 21, 2012 3:01 PM
To: 'Al Nash'
Cc: Mark Greene
Subject: RE: Counter information and LIHI letter

I'm sorry to tell you that I just can't get to this until January. Too many last minute things and I'm am off next week. I will try to get to it promptly after the new year.

I will reassure Mark that I have decided to write the letter of support for LIHI. In most cases, I send that directly to LIHI. Should I do that (and copy you) or should I send it to one of you?

Merry Christmas.

Steve

From: Al Nash [<mailto:al.nash@renewablepowerconsulting.com>]
Sent: Wednesday, December 19, 2012 11:42 AM
To: Gephard, Steve
Subject: Counter information and LIHI letter

Good morning Steve - when you get a chance would you please send me the Denil counter information we discussed and the LIHI letter for Norwich's Occum and Greenville stations?

Alfred Nash, P.E.
Renewable Power Consulting, PA
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**ENVIRONMENTAL INSPECTION REPORT
(ELECTRONICALLY SUBMITTED)
FEDERAL ENERGY REGULATORY COMMISSION**

New York Region

Date of Inspection – May 11, 2005

Name Occum Project No. 11574-CT

Licensee City of Norwich – Dept. of Public Utilities License Type Minor

License Issued September 29, 1999 License Expires August 31, 2039

**Location Shetucket River None
(Waterway) (Reservation)**

New London Connecticut
(County) (State)

Inspector Joseph Enrico

Licensee Representatives Mr. Roy Borque, Senior Watch Engineer

Other Participants None

Summary of Findings

The licensee is currently installing upstream and downstream fish passage facilities at the project which were completed in July, 2005. The construction area was fenced for security and public safety. There were no environmental issues at the construction area with sufficient safeguards for soil erosion and runoff control. The recreation area was open for access and all public safety measures were in place. There were no follow-up actions as a result of this inspection.

Submitted August 31, 2005

**Joseph G. Enrico
Environmental Protection Specialist**

A. INSPECTION FINDINGS

Requirements*	Date of Requirement	Follow-up Needed	Photo Nos.
CULTURAL RESOURCES			
Article 408 requires the Licensee to implement the Programmatic Agreement on Cultural Resources. CMP filed on August 30, 2001. C-185	O: 9-29-99 Ap: 8-30-01	N	
FISH AND WILDLIFE RESOURCES			
Article 401 requires the Licensee to limit drawdowns of the impoundment to 2 feet below crest or top of flashboards. C-188	O: 9-29-99	N	
Article 402 requires the Licensee to release a minimum flow of 30 cfs into the bypass reach from leakage or spillage and 100 cfs when the downstream fish passage facility becomes operational. C-089.	O: 9-29-99	N	
Article 403 requires the Licensee to file a project operation monitoring plan for impoundment fluctuations and minimum flows. Filed 3-29-2000 & 12-18-2000. C-211	O: 9-29-99 Ap: 3-2-01	N	
Article 404 requires the Licensee to submit an erosion control plan prior to any future ground breaking activities at the project. Filed 9-29-00, 12-18-00 & 6-7-04 C-120	O: 9-29-99 Ap: 3-23-01 Ap: 8-3-04	N	
Article 405 requires the Licensee to file a final plan for the installation, monitoring and operation of an upstream fish passage. Filed 9-29-00, 12-18-00 & 6-7-04 C-026	O: 9-29-99 Ap: 8-3-04	N	1-3
Article 406 requires the Licensee to file a final plan for the installation, operation and monitoring of downstream fish passage facilities. Filed 9-29-00, 12-18-00 & 6-7-04. C-026.	O: 9-29-99 Ap: 3-23-01 Ap: 8-3-04	N	4-6
Article 407 reserves authority to the Commission to prescribe the installation of fish passage facilities. C-072	O: 9-29-99	N	
PUBLIC SAFETY			
Facilities and measures to assure public safety (18 CFR, Part 12). Plan submitted on April 13, 1994. C-111	O: 9-29-99 Ap: 11-1-94	N	7

Requirements*	Date of Requirement	Follow-up Needed	Photo Nos.
RECREATION RESOURCES			
Article 409 requires the Licensee to file a canoe portage plan. Filed 9-29-2000. NYRO letter dated August 31, 2001 confirming receipt and acceptance of as-builts. C-113	O: 9-29-99 Ap: 11-8-00	N	8
Recreation signing and posting (18 CFR, Part 8) C-118	O: 9-29-99	N	8
Standard Article 13 requires the Licensee to allow public free access to project waters and adjacent lands C-118	O: 9-29-99	N	
Submission of the Commission's Form 80 monitoring report C-112.	18CFR: Filed 4-1-03	N	
OTHER ENVIRONMENTAL RESOURCES			
Article 410 allows the Licensee to grant conveyances for non project use of project lands and waters, for certain actions without prior Commission approval. C-202	O: 9-29-99	N	

O=Order **C**=OEP-IT Code **18CFR**=Title 18 Code of Federal Regulations, **Ap**=Approved

Comments and Follow-Up Action

(1) **Fish Passage Facilities:** The Licensee requested and received an extension of time for facility installation so that the upstream and downstream facilities could be done at the same time for a significant cost savings. The facilities were near completion at the time of inspection.

(2) **Recreational Facilities:** The canoe portage and access facility was available for public use during construction as it is located on the opposite side of the river from the powerhouse/intake area.

B. EXHIBITS AND PHOTOGRAPHS

The following are provided to show the location of the project and to illustrate project features: Eight photographs and photo location map.

Cc: DHAC
Enrico, J./di



**Norwich
Public Utilities**

TRUSTED FOR GENERATIONS

REV. 8/11/2005
AUG 25 2005

August 11, 2005

Ben Mukherjee, Project Mgr.
19 West 34th Street
Suite 400
New York City, N.Y. 10001

Occum Project P-11574-CT
Annual Minimum Flow Report, 2004

Dear Mr. Mukherjee,

During the calendar year 2004, NPU operated the Occum project in accordance with the IMPOUNDMENT FLUCTUATION AND MINIMUM FLOW MONITORING PLAN. The following exceptions are noted:

- July 23, 2004: Occum Pond drawn down for inspection of fish ladder construction area.
- August 25, 2004-November 9, 2004: Occum pond drawn down daily for fish ladder construction, approximately 30 feet of flashboards removed from dam crest to facilitate spill over the dam.
- November 18-23, 2004: Occum pond drawn down daily for fish ladder construction.
- December 31, 2004: Occum pond drawn down for fish ladder construction.

There are no other exceptions to report.

Thank you,

Roy E. Bourque,
Senior Watch Engineer
860-823-4107
FAX 860-823-4159

94 FERC ¶ 62, 185
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

City of Norwich

Project No.
11574-001

ORDER MODIFYING AND APPROVING MONITORING PLAN
REQUIRED BY ARTICLE 403

(Issued March 02, 2001)

City of Norwich (licensee) filed for Commission approval, on March 29, 2000, and supplemented on December 18, 2000, a monitoring plan required by Article 403 of the license for the Occum Project.¹ Article 403 requires the licensee to consult with the U.S. Fish and Wildlife Service (FWS) and the Connecticut Department of Environmental Protection (CDEP) and develop a plan to monitor project operation and maintain the operating requirements specified in articles 401 and 402. The project is located on the Shetucket River, in New London County, Connecticut.

Article 401 requires the licensee to limit the drawdown in the impoundment to two feet from the top of the flashboards or two feet below the masonry dam crest when the flashboards are not in place (no lower than elevation 64.1 feet NGVD). Article 402 requires the licensee to release a minimum of 30 cfs or inflow, whichever is less, through a combination of leakage and spillage when the project is not operating, and, following installation of the downstream fish bypass, a total of 100 cfs or inflow, whichever is less, through a combination of leakage, spill, and the downstream sluiceway when the project is not operating and the impoundment elevation at the downstream Taftville Project is below 48.9 feet NGVD. The project operates in a peaking mode relying on pulsed releases from the upstream Scotland Project (FERC No. 2662).

LICENSEE'S PLAN

The licensee proposes to monitor impoundment elevations in the project forebay using a pressure transducer on the east masonry forebay wall, upstream of the intake racks. Readings will be recorded hourly by project personnel using the existing SCADA system.

¹88 FERC ¶ 62,299 (1999).

The required minimum flow will be released through the forebay sluice and/or over the spillway, prior to installation of the downstream fish passage facility.² When the forebay is dewatered, the unit will be off-line and all flow will be passed over the spillway. The licensee states changes in impoundment elevation limit the amount of flow released through the forebay sluice to a greater extent than originally assumed. Therefore, until such time that the downstream fish passage facility is operational, the licensee proposes to restrict impoundment elevations, more so than that required by article 401, in order to provide the required flow. The licensee plans to maintain impoundment elevations to within 0.77 foot from the top of the flashboards when in place (at an approximate impoundment elevation of 65.33 feet NGVD) until such time that the downstream fish passage facility is functional. Following the installation of the downstream fish passage facility, which will provide another means of releasing additional water, the operating range specified in Article 401 will be maintained. Calculations were provided with the plan that indicates an impoundment elevation maintained to within 0.77 feet from the top of the flashboards would provide enough head to release the required minimum flow through the forebay sluice and from leakage. The licensee provided the results of a recent leakage study (leakage flows were estimated to be approximately 8-9 cfs in August 2000).

Flashboards at the project consist of a lower support section, approximately 9 inches high, and an upper 12-inch high board section. The licensee states that loss of the upper board section can occur without loss of the lower section. During periods when the both sections are out, the licensee plans to maintain the impoundment elevation at 64.45 feet NGVD, providing a minimum of 1.2 inches of spill over the spillway. If the lower support section remains in place, the licensee states the impoundment elevation will be maintained at or above 65.15 feet with the minimum flow released through the forebay sluice and over the top of the timber supports. Calculations were provided to verify that at these impoundment elevations, the minimum flow would be maintained.

²Article 406 requires the licensee to develop a plan and schedule for the operation, maintenance, and monitoring of a downstream fish passage facility. This plan was filed with the Commission on September 29, 2000, and is currently under review. Article 403 specifies that the facility be installed by September 2002.

Following installation of the downstream fish passage facility, the licensee plans to release the required minimum flow (minus leakage) through the facility in the event the project is not operating and the impoundment of the Taftville Project is 48.9 feet NGVD, as required by Article 402. Monitoring of the downstream impoundment elevation will be through the use of a pressure transducer in the Taftville impoundment connected to the licensee's SCADA system. The licensee plans to determine the settings necessary to release the required flow through the facility during the final design stage of the facility. The licensee states that two settings will be established for the fish passage system and will be based on calculations of the size of the opening necessary to provide the required spill with the impoundment drawn down two feet below the top of the flashboards or two feet below the masonry dam crest. Either setting will provide more than the required spill when the reservoir is above these minimum elevations.

In the event of flashboard failure, the licensee states an interruption in flow may occur during flashboard maintenance or replacement. During this type of maintenance, the licensee plans to draw down the impoundment to approximately one foot below the dam crest. Depending on flow during the maintenance, unit operation will be maintained to prevent dewatering of the downstream reach during the drawdown and refill. If inflow is not sufficient to maintain operation and a minimum flow interruption occurs, during flashboard maintenance or any other time, the licensee plans to notify the Commission within ten days, as required by Article 402.

The licensee plans to provide flow and operating data to the FWS, National Marine Fisheries Service (NMFS), U.S. Geological Survey, or the CDEP within 30 days of any agency request. The licensee plans to install the monitoring equipment in the first full construction season following Commission approval of the plan.

AGENCY COMMENT

By letter dated March 17, 2000, the FWS commented on the proposed plan. The CDEP did not provide written comments on the plan.

At the time of the FWS's March 17 letter, the licensee had not verified the quantity of leakage at the project. In August 2000, the licensee performed the requested study thereby making many of the specific comments regarding FWS's recommended impoundment elevations moot.

When flashboard maintenance is necessary, the FWS recommends that the licensee coordinate their maintenance needs with the downstream project so that maintenance can occur when the downstream impoundment is at full pond in order to maximize

backwatering effects. The licensee states they will attempt to do so, but since it has no control over elevations at the downstream project, the licensee cannot guarantee it.

DISCUSSION

The licensee proposes to further restrict impoundment elevations until such time that a downstream fish passage facility is constructed. The licensee proposes the minimum impoundment elevations necessary to maintain the required flow are the following: (1) 65.33 feet NGVD when the flashboards (both upper and lower sections) are in place with all flow released through the forebay sluice; (2) 65.15 feet NGVD when just the lower flashboard section is in place with flow released through the forebay sluice and over the top of the lower flashboard support section; and (3) 64.45 feet when both sections of flashboards are removed with all flow released via the spillway. At these impoundment elevations, the licensee assumes a leakage rate of 8-9 cfs.

Article 403 specifies the monitoring plan include provisions to monitor impoundment surface elevation, tailwater elevations, and minimum flows released, to include use of the planned fish passage facility. The licensee's plan includes provisions to directly monitor impoundment surface elevations and the elevation of the downstream impoundment. Minimum flows will be documented through impoundment elevations and forebay sluice settings until such time that the downstream fish passage facility is operational. Calculations to determine the actual settings for releases through the downstream fish passage facility are expected to be included in the detailed design drawings that are required by Article 303.

While we recognize the licensee has no control over the operation of the downstream project, flashboard repair should be planned while the downstream impoundment is at full pond to the extent practicable, as recommended by the FWS. So that the Commission can monitor compliance with articles 401 and 402, the licensee should report any deviations from those requirements to the Commission within 30 days of the incident. We conclude the licensee's monitoring plan with this modification, is adequate to ensure compliance with the operating requirements of the project license and should be approved.

The Director orders:

(A) The licensee's operation and monitoring plan, filed with the Commission on March 29, 2000, and supplemented on December 18, 2000, as modified in paragraphs (B) and (C), is approved.

(B) If the minimum flow, as measured by the approved gages, falls below 30 cfs, or inflow (or 100 cfs, or inflow, after installation of the downstream fishway), as required by Article 403, or if the reservoir elevation deviates from the requirements of Article 401 (or the interim operating range described here prior to installation of the downstream fishway), the licensee shall 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 also include: 1) operational data necessary to determine compliance with Articles 401 and 402; 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 incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance.

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

The Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.3
888 First Street, NE
Washington, DC 20426

In addition, the licensee shall serve copies of these filings on any entity specified in this order to be consulted on matters related to these filings. Proof of service on these entities shall accompany the filings with the Commission.

(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 CFR § 385.713.

George H. Taylor
Group Leader
Division of Hydropower Administration
And Compliance