

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Central Vermont Public
Service Corporation

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Project No. 2489-015

ORDER APPROVING FLOW FLUCTUATION REDUCTION PLAN
NOV 22 1996

Central Vermont Public Service Corporation (licensee) filed for Commission approval, on November 13, 1995, and supplemented on November 4, 1996, a flow fluctuation reduction plan for the Cavendish Project. This plan is required by ordering paragraph (B) of the Order Modifying and Approving Flow Management Plan, issued on August 17, 1995. 1/ The project is located on the Black River in Windsor County, Vermont.

Ordering paragraph (B) of the August 17 order requires the licensee to consult with the U.S. Fish and Wildlife Service (FWS) and the Vermont Agency of Natural Resources (VANR) and develop a plan to minimize project-induced flow fluctuations downstream of the project which may occur as a result of project shutdown. The plan shall include an outline of operating procedures implemented prior to and immediately following shutdown of individual units and full project shutdown.

LICENSEE'S PROPOSED PLAN

Prior to the shutdown of 2-3 units 2/ [i.e., incidents when river flow is between 86 and 263 cubic feet per second (cfs)], the licensee proposes to shut down one unit and increase fish passage flow from 10 to 20 cfs. 3/ When the increased flow in the bypassed reach enters the project's tailwater area, approximately 45 minutes later, the licensee proposes to shut down a second unit. In the event of a full station shutdown, the licensee proposes to shut down the remaining unit after an additional 45 minutes have passed.

In the event of a planned shutdown of a single unit (i.e., incidents in which river flow is between 31 and 85 cfs), the licensee plans to reduce the load on the operating unit by half,

1/ 72 FERC ¶ 62,150.

2/ The powerhouse contains 3 horizontal shaft Francis turbine generators with a combined installed capacity of 1,440 kW.

3/ Article 402 requires a minimum flow of 10 cfs, or inflow, whichever is less, in the bypassed reach. As outlined in the licensee's approved flow management plan, this 10 cfs will be passed through the downstream fish passage facility.

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or to the minimum load point of 19 cfs, whichever is greater, and increase fish passage flow to 20 cfs. When the increased flow in the bypassed reach enters the project's tailwater area, the licensee proposes to shut down the unit. When river flow is less than 30 cfs, the licensee plans to increase fish passage flow to 15 cfs and shut down the unit when the increased flow enters the project's tailwater area. The licensee expects the latter scenario to occur fewer than two times per year.

The licensee stated that unplanned shutdowns caused by lightning strikes to the substation are expected to occur fewer than twice per year. Following such an emergency shutdown, the turbine isolation valves do not close, allowing a small amount of flow to be passed through each unit (approximately 3-8 cfs per unit depending on wicket gate position). Due to the minimum flow through the fishway and the normal reservoir elevation operating range, i.e., within 1 inch of the top of the rubber dam, the licensee stated that unplanned shutdowns are not expected to create a lag of significant duration. The licensee is in the process of upgrading its lightning protection equipment and separating common unit control devices to lessen the probability of project shutdown resulting from lightning strikes.

AGENCY COMMENTS

The VANR and FWS commented on the licensee's proposed plan in letters dated September 28 and October 3, 1995, respectively. The FWS stated they have no objection to the proposed plan and the proposed measures should adequately minimize project-induced flow fluctuations downstream of the dam which may occur when generation at the project ceases.

The VANR stated the staged shutdown of the units, as proposed, may be effective in reducing the magnitude and duration of downstream flow fluctuations in order to minimize the deviation from run-of-river conditions. The VANR indicated a willingness to assist the licensee in identifying sections of the river which are sensitive to flow reductions and recommended field trials when flow conditions are suitable. The VANR stated it is difficult to design effective protocols without field evaluation and suggested the plan not be finalized until the recommended field work is completed. Specifically, the VANR expressed concern regarding situations where flows are temporarily reduced below the project's summer aquatic base flow of 42 cfs, incidents in which station discharge is reduced by half, and unplanned shutdowns. Other comments made by VANR were incorporated into the licensee's proposed plan.

In the proposed plan, the licensee stated their willingness to conduct field evaluations during summer 1996. By letter dated February 16, 1996, the Commission acknowledged that the field evaluation would be completed in summer 1996.

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FIELD EVALUATION

On September 26, 1996, the licensee conducted the field evaluation, as recommended by VANR. The VANR was present during the field observations. The results of the field observations, along with comments from VANR, were filed with the Commission on November 4, 1996.

To assess the magnitude of flow fluctuations, staff gages were installed approximately 500 yards, 1 mile, and 3 miles downstream of the powerhouse. During low flows with one unit operating, the proposed plan was implemented. River stage approximately 500 yards downstream of the powerhouse decreased a maximum of 0.08 foot. Fluctuations observed approximately 1 mile downstream of the powerhouse were similar in magnitude. Approximately 3 miles downstream of the powerhouse, flows appeared unaffected by the unit shutdown.

In a letter dated October 25, 1996, the VANR stated the procedures outlined in the flow fluctuation reduction plan are adequate given the constraints of the project. The VANR did recommend, however, the licensee keep the units on-line at least 45 minutes after flows have been increased in the bypassed reach, to allow the additional flow to reach the project's tailrace area.

DISCUSSION

The intent of implementing a flow fluctuation reduction plan is to minimize any adverse impacts associated with the shutdown of the units in the powerhouse. Since flows released from the dam will be conveyed through the 1,570-foot-long bypassed reach, it is necessary to minimize the effects of lag time on run-of-river operations at the project.

Based upon field observations, minimal fluctuations were observed downstream of the powerhouse upon implementation of the proposed plan during a low flow period. The increased flow in the bypassed reach appears sufficient to prevent stranding during unit shutdown. Given the observed fluctuations are representative of periods when river stage is typically low, implementation of the licensee's proposed plan during higher flows with multiple unit shutdown should also be sufficient to minimize the potential for stranding. As recommended by VANR, the licensee should allow sufficient time for the increased flows from the bypassed reach to reach the project's tailwater area.

The licensee's proposed plan includes measures which should be sufficient to reduce the deviations from run-of-river operations which result from project shutdown. The licensee's flow fluctuation reduction plan should be approved.

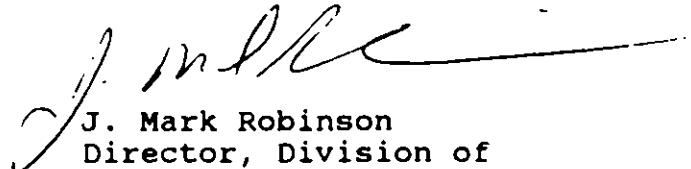
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The Director orders:

(A) The licensee's flow fluctuation reduction plan, filed on November 13, 1995, and supplemented on November 4, 1996, is approved.

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



J. Mark Robinson
Director, Division of
Licensing and Compliance