

76 FERC ¶ 62,177

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Consolidated Water
Power Company)

Project No. 1953-026

ORDER MODIFYING AND APPROVING RECOMMENDATION FOR
MITIGATING LOW DISSOLVED OXYGEN CONCENTRATIONS
AND DELETION OF ARTICLE 405

Consolidated Water Power Company (licensee) filed on October 17, 1994, a final water quality monitoring report, required by article 406 of the license for the DuBay Project. 1/ This report included an evaluation of the effectiveness of installing a skimmer weir in maintaining and improving dissolved oxygen concentrations (DO) in the project tailrace. 2/

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BACKGROUND

The Commission approved the licensee's water quality monitoring plan in the Order Approving and Modifying Dissolved Oxygen Monitoring Plan, issued on October 16, 1992. 3/ In accordance with article 406 and the October 16 order, the licensee's final report included an evaluation of the effectiveness of the skimmer weir and the licensee's recommendations, for Commission approval, on measures to improve downstream DO. The report was to include any additional measures to improve downstream DO, if determined to be necessary. These additional measures were to be developed in consultation with the U.S. Fish and Wildlife Service (FWS) and the Wisconsin Department of Natural Resources (WDNR).

The project is located on the Wisconsin River and receives flows from four tributaries: Big Rib, Big Eau Pleine, Little Eau Pleine, and Eau Claire Rivers. There are 13 hydropower dams upstream of the DuBay Project. Downstream, the backwater effect of Stevens Point Dam (FERC No. 2110) extends to DuBay Dam.

Runoff of oxygen-demanding materials and algae loading from the eutrophic Big Eau Pleine Reservoir contributes to depressed

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- 1/ 57 FERC ¶ 62,057. See also Order on Rehearing, Dismissing Stay Requests, and Denying Exemption Request, issued on February 8, 1993 (62 FERC ¶ 61,122).
 - 2/ Article 405 of the license requires the licensee to install a skimmer weir at the bottom of the stop gate slots in each of two forebays of one of the large turbine units whenever DO concentration measures in the project tailrace approach the state DO standard of 5 milligrams per liter.
 - 3/ 61 FERC ¶ 62,054. See also Order on Rehearing, issued April 20, 1993 (63 FERC ¶ 61,086).

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DO in the Wisconsin River. Game fishes found downstream of the dam include walleye, bluegill, smallmouth bass, black crappie, yellow perch, and pumpkinseed. 4/

LICENSEE'S PROPOSED SKIMMER WEIR EVALUATION

When DO in the project tailrace approached the state standard of 5.0 milligrams/liter (mg/l), the licensee performed 30 tests to evaluate the effectiveness of the skimmer weir, each lasting from one to four hours. The DO was measured every 15 minutes during each of the tests. Readings were taken by one of two methods, either with the licensee's on-line DO monitor 5/ via the Supervisory Control and Data Acquisition or by a handheld DO meter. For quality assurance, the licensee periodically took duplicate readings to monitor the accuracy of the meters and calibrated the instruments as necessary.

On several occasions, the licensee measured DO above the forebays using the handheld meter. In general, the licensee stated that lower DO occurred at greater depths; however, exceptions did occur indicating a mixing of the water column in front of the forebays.

During testing, the licensee observed forebay discoloration when the skimmer weirs were installed. The licensee stated the discoloration was more predominant during a mild algal bloom when the water was green. Near the skimmer weirs, however, the water remained brown. The licensee recorded DO inside and outside the brown plume on three occasions. Significant differences in DO were detected between the two types of water. The brown-colored water averaged 2.40 mg/l below that of the green tinted water. The licensee stated that removal of the weir in all cases eliminated the plumes of brown water. The licensee concluded that the skimmer weir may be drawing the brown, low DO water into the turbine inlet. The licensee concluded that installation of the skimmer weir resulted in bottom upwelling of low DO water.

The licensee stated that the mean difference of all 30 tests was 0.12 mg/l, which is smaller than the ± 0.2 mg/l accuracy limit of the monitoring equipment. The licensee stated that, when the skimmer weir was installed, DO in the tailrace rose 43 percent of the time and dropped or did not change 57 percent of the time.

4/ Information contained in Commission staff's Environmental Assessment prepared for the Application for License (57 FERC ¶ 62,057).

5/ The DO was measured by a sensor located on a downstream pier between two generating units.

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Based upon the results presented in the final report, the licensee concluded that the use of the skimmer weir is not effective in maintaining DO above state standards and may even be detrimental to tailrace DO in some situations.

LICENSEE'S RECOMMENDATIONS

The licensee recommends that the requirement for the use of the skimmer weir be eliminated from the license. Further, for low DO lasting longer than eight continuous hours, the licensee proposes to run one of the turbines continuously in order to increase DO in the tailrace. The licensee stated that modifying unit operations has been attempted in the past with varying results but will not guarantee improvements in water quality during a low DO situation.

AGENCY COMMENT

In a letter dated September 14, 1994, the licensee requested agency comments on the final water quality monitoring report and the recommendations of mitigating low DO. The WDNR and the FWS did not provide written comments on the final report or the licensee's recommendations.

STAFF'S PRELIMINARY ANALYSIS

In a letter dated July 1, 1996, Commission staff provided a preliminary analysis of the licensee's proposed recommendation for mitigation of low DO. The analysis included staff's recommendations as discussed in the following section. These recommendations were based on Commission staff's review of the licensee's final water quality monitoring plan, the licensee's reports of low DO events occurring at the project during summer 1994-1995, and the licensee's approved DO monitoring plan.

Commission staff requested comments on staff's preliminary analysis from the licensee, WDNR, and FWS by August 15, 1996. The licensee, WDNR, and FWS did not comment on staff's preliminary analysis.

DISCUSSION

Our analysis of the licensee's final report and an evaluation of low DO that occurred during summer 1994 ^{6/} indicate that the skimmer weir is not effective in maintaining DO in the project tailrace during low DO. The information provided indicates, as DO approaches 5.0 mg/l (those tests conducted when DO was between 5.5 and 5.1), DO in the project tailrace did not increase after installation of the skimmer weir. Further, in

^{6/} See Commission letters dated August 24 and November 8, 1994.

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approximately two-thirds of the tests performed, changes in DO were less than the accuracy limit of the DO monitoring equipment (± 0.2 mg/l). Therefore, the use of the skimmer weir during periods of low DO, as required by article 405, should be discontinued.

During the licensee's evaluation, DO was measured from a downstream pier between two generating units. This allowed the licensee to directly evaluate the effects of the skimmer weir on DO in the project's tailrace. While conclusions regarding the skimmer weir's effectiveness based upon this information are appropriate, our analysis indicates this data may not accurately reflect water quality a short distance downstream from the dam. For example, data collected at the project on June 27, 1995 (which included grab sampling of DO upstream and downstream of the project tailrace), indicated that DO measured approximately 100 feet downstream of the tailrace was 6.0 mg/l, even with low DO inflow (4.8 mg/l) and low DO project discharge (5.3 mg/l). 7/

The licensee proposes to continuously operate one of the generating units in efforts to improve DO downstream of the project. Based upon the data available regarding DO in the project discharge, our analysis indicates this method has only provided for limited success in the past. 8/ As discussed above, however, this conclusion is based upon DO measured in the project tailrace.

To determine if continuous generation is effective at maintaining DO, additional information regarding water quality farther downstream of the project tailrace is needed. Therefore, our analysis indicates the licensee should evaluate downstream DO (i.e., approximately 100 feet downstream) for one year during low DO, when continuous generation is being provided. Readings should be comparable to the methods used in the licensee's approved DO monitoring plan. 9/ Upon completion of this evaluation, the licensee should submit a report to the Commission regarding maintenance of DO downstream of the project tailrace during continuous generation. The report should be submitted to

7/ See the licensee's report on low DO, filed with the Commission on July 21, 1995. The project was operating two units at a total output of approximately 6.13 megawatts.

8/ The licensee reported several low DO events in letters filed with the Commission on July 18 and September 12, 1994, and July 19, August 19, and September 20, 1995. These reports indicated that continuous operation of units did not significantly improve tailrace DO levels.

9/ See 61 FERC ¶ 62,054. See also Order on Rehearing, issued April 20, 1993 (63 FERC ¶ 61,086).

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the WDNR and FWS prior to filing the report with the Commission. Each agency should be given 30 days to comment. Based upon the results of the evaluation, the Commission should reserve the right to require additional measures to mitigate low DO downstream of the project tailrace.

The licensee's proposed recommendation to improve downstream DO, with the modifications discussed, should be approved.

The Director Orders:

(A) The licensee's recommendation to mitigate low DO, filed with the Commission on October 17, 1994, as modified in paragraph (B), is approved. Article 405 shall be deleted from the license.

(B) The licensee shall evaluate downstream DO for one year during low DO, when continuous generation is being provided. Upon completion of this evaluation, the licensee shall submit a report to the Commission regarding maintenance of DO downstream of the project tailrace during continuous generation. The report shall be submitted to the Wisconsin Department of Natural Resources and the U.S. Fish and Wildlife Service prior to filing the report with the Commission. Each agency shall be given 30 days to comment. Based upon the results of the evaluation, the Commission shall reserve the right to require additional measures to mitigate low DO downstream of the project tailrace.

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

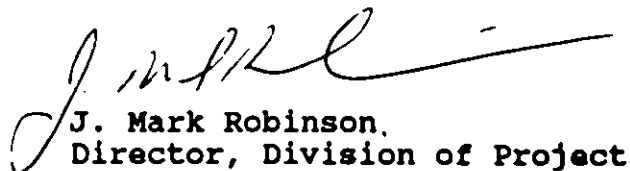
The Secretary
Federal Energy Regulatory Commission
Mail Code: DPCA, HL-21.1
888 First Street, NE
Washington, DC 20426

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.

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(D) 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 Project
Compliance and Administration