

UNITED STATES OF AMERICA 106 FERC ¶ 62,206
FEDERAL ENERGY REGULATORY COMMISSION

Wisconsin Electric Power Company

Project Nos. 1759-075 and -076

ORDER APPROVING LOW DISSOLVED OXYGEN MITIGATION
PLAN UNDER ARTICLE 418

(Issued March 18, 2004)

On December 19, 2002, Wisconsin Electric Power Company (licensee) filed a low dissolved oxygen (DO) mitigation plan under article 418 of the Way Dam Project (FERC No. 1759). On March 2, 2004, the licensee supplemented its plan with a progress report. The project is located on the Michigamme River in Iron and Dickinson Counties, Michigan.

LICENSE REQUIREMENTS

Article 408 requires the licensee to ensure that project operation will not result in the discharge of water with a DO level of less than 5.0 milligrams per liter (mg/l).

Article 418 requires the licensee to prepare and file for Commission approval a plan and schedule to identify flow release methods for addressing periodic low DO concentrations in the Way Dam tailrace occurring during low flow periods. The licensee is to prepare the plan after consultation with the Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality (MDEQ), and U.S. Fish and Wildlife Service (USFWS).

LICENSEE'S PLAN

Pre-licensing water quality monitoring seemed to indicate that low DO releases would occur only during abnormally warm and dry summers. At the time of the license application filing, it was thought that the low DO releases would be an occasional problem. The licensee states that low DO releases are now probably more prevalent than previously understood and will take significantly more time and effort to resolve.

Phase I of the filed plan includes a comprehensive review of mitigation strategies in the literature that (1) can correct for very low DO levels encountered at the Way Dam (readings less than 1.0 mg/L are not uncommon) and (2) are feasible from an economic perspective (potentially supportable by the project's economics). A team will conduct the comprehensive review and identify alternative low DO mitigation strategies that are potentially applicable to the project. These alternatives will then be critically analyzed during Phase II.

Currently, when low DO is sensed by the plant's continuous monitoring device, the licensee blends generation and spillway flows in a proportion that theoretically results in attainment of the DO standard within a short distance downstream of the project. However, this mitigation strategy is only viable when total water releases from the project are sufficient to meet the minimum flow required to operate the generator (300 cfs) plus sufficient spillway flow to mix with the water from the generator to raise the DO to the minimum required level. The total outflow required to achieve mixing maybe significantly higher than the minimum flow required by the license but this amount of water may not be available during dry periods. If water available for release is less than what is required for mixing to occur, all available flow is currently spilled.

The objective of the field studies in Phase I would be to thoroughly document attainment of mixing as well as the approximate downrange extent of the mixing zone, within which, sub-areas might be below the standard. The field studies as currently planned would use continuous recording devices for temperature and DO in both the spillway and tailrace segments close to the plant. Stations would be set up in the river downstream of the plant. A water quality surveyor unit would then be used to take in-stream measurements of water temperature and DO at each station. These measurements would be made for each combination of flow from the turbine and spillway that may be tried to document the veracity of the assumptions/calculations. Flow in each segment would also be measured, if possible, to ground-truth the estimated flows associated with turbine and spillway operations. A detailed scope of work will be prepared for agency review well in advance of any field investigations.

Phase II tasks involve site-specific assessments of each alternative. Once the team has identified feasible alternatives, assessments will be conducted. For those alternatives requiring civil works modifications, preliminary drawings will be prepared. The team will prepare preliminary cost estimates for each alternative. Cost estimates will include engineering, materials, and labor. If the generation must be shut down to accommodate the construction of an alternative solution, estimates of lost energy value will be included in the estimated cost.

The team will be assembled within one month of Commission approval of the plan. The literature review will be completed within 3 months. The preliminary findings, identification of feasible alternatives, will be drafted for review by the MDEQ. The MDEQ will be allowed 60 days to review the initial list of alternatives. This amount of time should be adequate for on-site meetings to discuss possible corrective measures. These activities would be completed within 6 months after Commission approval of the plan.

Once concurrence by the team on the list of alternatives for Phase II work has been achieved, detailed work will commence. It is anticipated that Phase II work, depending on the number of alternatives identified, and their complexity, may require upwards of twelve months to complete. Field evaluations of the tailrace/spillway blending would take place in mid to late summer of 2003 or 2004. This work can only be attempted if low DO concentrations are encountered in the lower strata of the reservoir.

LICENSEE'S 2003 PROGRESS REPORT

The licensee states that it reviewed feasible modifications that could correct the low DO problem as well as their related costs. One alternative included modifications to the project that would allow for continued water extraction for the purposes of power generation without impacting water quality standards in the project tailrace.

As a result of the analysis, the licensee concluded that the only cost effective alternative to correct the low DO problem downstream of the Way Dam Project would be to suspend flow through the turbine (cease generation) when DO levels in the intake water fall below 3.0 mg/L. When DO levels fall below 5.0 mg/L but remain above 3.0 mg/L, it may be possible to meet the DO standards in the river downstream of the tailrace/spillway confluence by mixing spillway and tailrace (generation) flows. The licensee states testing to explore this alternative will be performed in 2004 if water availability and low DO conditions permit.

The analysis did not consider turbine venting because information available at the time indicated the technology would not provide the necessary improvement to meet the state standard for low DO. Additional information has become available that suggests the technique may meet state standards. The licensee indicates it will evaluate this technology when engineering is performed for the Way Dam runner replacement after 2005. In addition, the licensee is continuing its analysis of feasible solutions to low DO conditions in the 800-foot tailrace section that exist even under the no generation alternative.

AGENCY COMMENTS

By letter dated November 11, 2002, the licensee requested comments on its plan from the MDNR, MDEQ, and USFWS. By letter dated November 18, 2002, the MDNR concurred with the plan. The MDEQ, in a letter dated December 11, 2002, provided comments which the licensee incorporated into its final plan. The USFWS did not comment.

By letter dated December 4, 2003, the licensee requested comments from the agencies on its progress report. The MDNR, by letter dated January 28, 2004,

recommended the licensee explore bubbler systems and siphons. The licensee responded that it will evaluate the use of bubblers in the tailrace during 2004.

The MDEQ, by letter dated January 29, 2004, indicated it did not have any comments on the progress report and will review the complete list of Phase I options upon Commission approval of the plan.

DISCUSSION

The licensee's proposed low DO mitigation plan and schedule as supplemented, along with continued consultation with the resource agencies, should ensure the low DO problems at the project will be addressed. The licensee's two phase plan will allow for a review of potential remedies followed by actual in-field testing of potential solutions.

The licensee's low dissolved oxygen mitigation plan is consistent with the requirements of article 418 and should, therefore, be approved.

The Director orders:

(A) The licensee's low dissolved oxygen mitigation plan for the Way Dam Hydroelectric Project (FERC No. 1759), filed on December 19, 2002, and as supplemented March 2, 2004, is approved.

(B) 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 18 CFR § 385.713.

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and Compliance