INTERNATIONAL RAINY LAKE BOARD OF CONTROL

NEWSLETTER

REVIEW OF THE IJC ORDER FOR RAINY & NAMAKAN LAKES

Number 4 March, 1998

This is the fourth in a series of periodic newsletters concerning the study currently underway to review the rule curves used to manage the water levels of Rainy and Namakan lakes. The study is proceeding in accordance with a Plan of Study adopted by the International Joint Commission (IJC) in 1996, and was initiated in response to a proposal for change by the Rainy/Namakan Water Level International Steering Committee (SC).

Status Report

The Board's Status Report on the study was released on March 3rd, 1998 and its content was presented at the Board's annual public meeting on March 10th in International Falls. This report summarizes the work done to date, notes the work remaining, and presents a number of preliminary findings. The public are encouraged to review the report and provide their comments to the Board. The report is posted on the Board's Web site and is also available in paper form or on computer diskette by contacting either of the Engineering Advisors (see the end of this Newsletter for Web site and contacts). Both the Web and diskette versions contain model result graphs in colour.

Fisheries Review

Newsletter #1 reported the initial findings of two independent fisheries experts, one Canadian and one American, who had been retained by the Board to evaluate the existing and proposed rule curves in terms of the fishery. Subsequent to their initial review, modelling of simulated natural levels on Rainy and Namakan was completed (see Newsletter #3) and the fisheries experts were asked to re-evaluate their work in light of these findings.

The experts re-iterated their belief that a return to more natural conditions would benefit the fishery. They noted that, due to human activity, both lakes have been markedly altered as a habitat for fish, and that lake levels and especially level variability have been greatly changed. Based on the modelling, they noted that neither the existing IJC rule curves or the proposed SC curves came close to approximating natural conditions. However, they felt that the SC curves represented a worthwhile improvement in that direction, especially on Namakan. Citing uncertainties due to other factors such as fishery exploitation, they proposed an experimental approach, whereby the proposed SC curves would be adopted on Namakan and the existing IJC curves retained on Rainy. With proper monitoring, they felt this would indicate if a return to more natural conditions is the key to fisheries rehabilitation.

Environmental Data Summary

As noted in Newsletter #2, the initial environmental review conducted by the US Army Corps of Engineers generally agreed that the SC proposed rule curves should produce net ecological benefits. They had commented, however, that periodic events above and below either set of rule curves would be beneficial and should be permitted. In their re-evaluation after seeing the results of the natural level modelling, the Corps reviewers again stressed the benefits of water level variability, noting that inter-annual variability, especially during the summer, is significantly stifled under both the SC and IJC rule curves. They suggested a greater summer drawdown. As to the finding from the modelling that the SC curves attempt to refill Rainy Lake earlier than what would have occurred naturally, they noted that, even if such a refill is less natural, it still would likely benefit a number of ecosystem resources.

Hydrologic Modelling

Results of lake level modelling with the existing IJC and proposed SC rule curves were summarized in Newsletter #3. Since then, limited additional modelling was conducted to assess the rule curve alternative proposed by the fisheries experts (and supported by the Border Lakes Association), plus one other alternative. These alternatives were called C1 (SC curves on Namakan with IJC curves on

Rainy) and M1 (similar to C1, but with some summer drawdown introduced to the IJC curves on Rainy). Overall, with C1 or M1, Namakan results are very similar to the pure SC rule curve case. On Rainy, C1 and M1 roughly cut in half the flood impacts seen with the pure SC alternative. With C1 and M1, the annual energy generation loss compared to the IJC rule curve case is 2% and 5% respectively (it was about 7% with the SC curves).

Inflow Forecasting

The Plan of Study included an inflow forecasting component, with the initial phase being an assessment of whether or not improved inflow forecasting could realistically mitigate flood risk. It was found that, even if a perfect 7-day inflow forecast was possible, there would be less than a 1% reduction in rule curve violations when operating with either the IJC or SC rule curves. The benefit is minimal primarily due to the very restricted outlet capacity of the dams. Consequently it was concluded that no further work in this area is warranted as part of this study.

Preliminary Findings

While no recommendations have yet been formulated, preliminary findings are as follows:

- Enough information exists for the Board to make recommendations to the IJC regarding changes to the existing IJC rule curves.
- Adoption of the rule curves recommended by the Steering Committee would, on balance, enhance the fisheries and environmental benefits but would increase the potential for spring flooding and reduce hydropower production.
- Improved forecasting and management practices are unlikely to offset the potential increased flooding if the Steering Committee proposed rule curves are adopted.
- The Steering Committee rule curves are nominally more viable than the IJC rule curves on Namakan Lake and less viable on Rainy Lake as measured by the number of rule curve violations.
- There is merit to considering the use of the Steering Committee rule curves on Namakan Lake and the IJC rule curves on Rainy Lake.
- The natural lake level and outflow modelling indicates that the Steering Committee rule curves come closer to simulating the timing of the natural spring refill on Namakan Lake and the IJC rule curves come closer to simulating the timing of the natural refill on Rainy Lake.
- Adjustments to the minimum flow requirements for the outflow of Namakan Lake and Rainy Lake would decrease the number of lake level excursions outside of either the existing or proposed rule curves during low flow periods. The overall issue of changed timing and magnitude of flows downstream of Rainy Lake with changes to the rule curves must also be given due consideration.
- Any modifications to the existing rule curves, if recommended, must be accompanied by an appropriate fisheries and environmental monitoring program.

Remaining Activities

Work remaining to be conducted by the study team is primarily in the areas of detailed analyses of flood risk and of economic, social and recreational factors. The Board is also setting aside a significant block of time for others to review the work to date, especially the modelling results, and provide comment. It is especially important to get feedback from downstream interests that may be impacted by the changed outflows from Rainy Lake that would result from any rule curve change. The nature of this feedback will determine what additional work might be necessary before the draft final report is prepared.

The Status Report and other study documents can be found on the Board's Web page:
www.mvp-wc.usace.army.mil/ijc/rainylake.html

To request copies of the Status Report on paper or on diskette, or to be added to our mailing list, or if you have comments or questions, please contact the Board's Engineering Advisors:

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