



Procedures for Flow Adjustments and Deviations to Plan 2007

Plan 2007 is designed to handle a broader range of situations than the current regulation plan (Plan 1958-D). Furthermore, the International Joint Commission (the Commission) believes that, in most instances, it will be important to release flows as determined by Plan 2007 in order to realize the plan's benefits and to minimize uncertainty regarding planned flow releases and their effects. Therefore, the Commission anticipates fewer, more limited instances where flows released would differ from those called for by Plan 2007.

As described in the paper entitled *New Institutional Arrangements*, the Commission intends to retain a board, to be called the International Lake Ontario–St. Lawrence River Board, to oversee the implementation of the regulation plan. The Commission realizes that some adjustments from the flows determined by Plan 2007 will still be required, both in the short-term and potentially during long-term periods of extremely high or low water levels and flows. Such permissible flow adjustments, commonly called “deviations,” are described in further detail below. Authority for discretionary deviations from plan flows was granted by the Commission in 1961. The Commission intends to continue to authorize specific short-term deviations, but with the goals of returning quickly to those flows determined by Plan 2007 and of avoiding cumulative effects. The Commission also intends to provide for long-term deviations under certain defined high or low water level and flow conditions only after analysis by the Board and approval by the Commission for a one-month period, renewable after further analysis. The Commission's Board and its Regulation Representatives (Reg Reps) will continue to direct flows in accordance with the plan, authorize deviations, and provide regular reports.

The Board's Role with Respect to Discretionary Deviations

The roles of the Board's Reg Reps and Operations Advisory Group (OAG) will not change substantially. The Reg Reps will continue to consult weekly with the OAG to identify and resolve any operational issues that would impact implementation of the outflow specified by Plan 2007 for the following week. Such issues could include, for example, the need for flow adjustments for St. Lawrence River ice formation, for anticipated flooding in the Montreal area, or for assisting navigation in the Seaway or in the port of Montreal. Under current practice, as well as under the proposed operating procedures, if there are no operational difficulties, the outflow will be determined by the regulation plan.

Under both the current and proposed operating procedures, the Board is responsible for the weekly operations and must be made aware of conditions by the Reg Reps. If the Board cannot establish consensus regarding deviations from plan outflows, the issue is



raised to the Commission through the Commission's engineering advisors located in Washington, D.C., and Ottawa, Ontario.

If there is no consensus over deviations, the flow will be determined by the plan.

Adjustments Due to Forecasting Uncertainty

Under Plan 1958-D, deviations are made to successfully manage flood flows coming from the Ottawa River and flow changes for ice management. Plan 2007 is designed to produce the same results achieved under current practice. However, because Ottawa River discharges and ice conditions can change significantly from day to day and because the week-ahead forecasts of Ottawa River flows and ice conditions to be used for regulation calculations are not very accurate, short-term within-the-week flow adjustments are expected to be needed to avoid flooding near Montreal when the Ottawa River is high or to prevent ice jams from forming in the river. These flow adjustments are consistent with Plan 2007 and are accounted for in the plan, which was developed with the assumption that the flows during high Ottawa River outflows and ice formation would be adjusted normally in practice within the week as it has been with the existing regulation plan. If the plan does not achieve this, then the matter will be handled as a short-term deviation.

No flow restoration is needed to compensate for within-week flow adjustments due to forecasting errors associated with Ottawa River flows and ice management because the intent of Plan 2007 is to make adjustments during the week from forecasting errors made the previous week or within the same week. While they may occur within the same week, flow adjustments due to forecasting errors are different and will be distinguished from short-term discretionary deviations, in that short-term discretionary deviations require accounting and flow restoration, as described below. Flow adjustments due to forecasting error do not require flow restoration, but the Reg Reps will keep track of them in order to replicate plan results, as needed for subsequent plan reviews. Whenever there are potential flooding or ice management issues, the outflow may be modified with Reg Rep approval, and these issues will be brought to the Board's attention. This, again, is similar to current practice.

Short-term Discretionary Deviations (usually lasting less than a week)

With permission from the Board, the Reg Reps can also approve other minor within-week deviations from the plan flow. These deviations, called "short-term discretionary deviations," usually last less than a week and are used for such contingencies as hydropower unit maintenance. Other examples for which such deviations could be used include providing assistance to commercial vessels due to unanticipated low water levels and raising water levels for a few days to assist in recreational boat haul-out at the end of the boating season. Such flow deviations must be restored by equivalent offsetting



deviations to plan within a week's time of conclusion of the deviation, or as soon as conditions permit, to avoid or minimize cumulative impacts on the Lake Ontario level and to avoid changing the balance of Plan 2007 benefits. If restoration to the volume of water specified for release by the plan is not possible within the week, the Board must restore the amount within the next week. Flow restoration will only be allowed to take two weeks or more under rare circumstances, in which restoring flows more quickly would cause avoidable damage to various interests.

Such short-term deviations may be undertaken at the discretion of the new Board with post-action reporting requirements to the Commission, as part of normal semiannual reporting requirements. However, for any deviation requiring more than two weeks to restore, the Board shall advise the Commission in advance as soon as the potential need for the deviation is known by the Board. The Board shall also provide a flow restoration plan and obtain approval from the Commission on the plan or obtain a waiver from the Commission not requiring flow restoration. The details will be elaborated in a Commission directive to the Board.

Criterion 10 Deviations

It is necessary to minimize long-term deviations in order to preserve the benefits distribution of Plan 2007. A new criterion in the new Order of Approval (Criterion 10) allows for Commission-approved, longer-term deviations during rare high and low Lake Ontario levels. Criterion 10 has clear thresholds and automatically terminates after one month with few exceptions. The criterion states that when the Board forecasts three months in advance that there is a significant probability of Lake Ontario reaching a high water level that would be exceeded only 1% of the time, or a low water level exceeded all but 1% of the time ("1% and 99% percent exceedance"), it must submit an analysis to the Commission of the risks of reaching critical high or low threshold levels on the lake. The analysis must include a review of probable associated impacts. The Board may request authority to undertake deviations for a period of up to one month. A request for a Criterion 10 deviation must include a flow restoration plan or a recommendation that the amount be "zeroed" with a return to plan. It is understood that accumulated amounts of water from this deviation will rarely be restored within a few weeks, but will eventually be re-equilibrated over a longer term (months). A renewal of this deviation authority beyond one month may occur with a renewed analysis and request by the Board.

The 1% and 99% exceedances for Plan 2007 are based on Lake Ontario's seasonal cycle, taking into account the high and low water levels since 1954, and on the results of robust stochastic supply sequences used in the Lake Ontario–St. Lawrence River Study (Table 1).



Emergency Deviations

Emergency situations are unusual life-threatening situations, and situations that threaten the physical integrity of the system and may lead to a loss of the ability to control the flows in the system. Examples include the failure of a lock gate, flooding of the hydropower control works, failure of a spillway gate, dike failure, a large-scale blackout, or other such active or imminent incidents. These may arise on extremely rare occasions. In such cases, immediate action is required, and the Reg Reps are authorized to direct and approve, on the Board's behalf, emergency flow changes as required. The Reg Reps will report any such emergency actions as soon as possible to the Board and Commission.