

INTERNATIONAL UPPER GREAT LAKES STUDY BOARD

ORGANIZATIONAL AND OPERATIONAL GUIDELINES FOR THE HYDROPOWER TECHNICAL WORKING GROUP

GENERAL GUIDELINES AND INFORMATION

The Technical Working Groups (TWGs) are formed by the Board in consultation with the IJC. The TWGs are organized under specific tasks which fulfill the mandate of the IJC to undertake the studies required to provide the Commission with the information it needs to evaluate options for regulating levels and flows in the Upper Great Lakes system in order to benefit affected interests and the system as a whole in a manner that conforms to the requirements of the Treaty, and the Board shall be guided by this mandate in pursuing its studies. These studies include:

1. Examining physical processes and possible ongoing Lake Huron outflow and St. Clair River changes and their impacts on levels of Lake Michigan and Huron. Additionally, depending on the nature and extent of these changes and impacts, recommending and evaluating potential remedial options;
2. Reviewing the operation of structures controlling Lake Superior outflow in relation to impacts of such operations on water levels and flows, and consequently affected interests;
3. Assessing whether changes to the Order or regulation plan are warranted to meet contemporary and emerging needs, interests and preferences for managing the system in a sustainable manner; and
4. Evaluating any options identified to improve the operating rules and criteria governing the system.

Specific Tasks Teams (TTs) are the Lake Huron Outflow/ St. Clair River Task Team and Lake Superior Regulation Task Team (See attached “IUGLS Organization – Task Team Framework”). The following TWGs are established under the two Task Teams to provide the expert and technical support to deliver the Study:

I. Lake Huron Outflow/ St. Clair River Task Team:

1. Data Verification, Reconciliation, Collection and Monitoring;
2. Hydraulic Modeling; and
3. Sediment Studies.

II. Lake Superior Regulation Task Team:

1. Municipal, Domestic and Industrial Water Uses;
2. Commercial Navigation;
3. Eco-System;
4. Coastal Zone;
5. Hydropower; and
6. Recreational Boating and Tourism

III. Other TWGs which serve one or both TTs:

1. Basin Hydrology: to address net basin supply (NBS), net total supplies (NTS) and climate change issues for both Task Teams;
2. Plan Evaluation: directly linked to the Lake Superior Regulation Task Team, but could peripherally be connected to the Lake Huron Outflow/ St. Clair River Conveyance Task Team;
3. Mitigation Issues: directly linked to the Lake Huron Outflow/ St. Clair River Task Team, but could peripherally be connected to the Lake Superior Regulation Task Team.

The individuals appointed to the TWGs provide the Study Team and the International Joint Commission their expertise and support in their personal and professional capacity and not as representatives of their agencies or employers. The Board provides guidance to the TWGs directly and through the Study Co-Managers. Each TWG should, whenever possible, be composed of equal numbers of members from the U.S. and Canada, and there shall in all cases be at least one member from each country. Each TWG will have two co-Leads, one from each country. All reports of TWGs shall include any dissenting or different views within the group.

Study Board and PIAG members will be apprised of the activities of the TWG by the Task Team Co-Chairs and specifically by TWG co-Leads for those in which they have an expertise in the subject being evaluated by that TWG.

TWG members are committed to work with their specific group as a team in advising on the issues and delivering the work with which the group is tasked.

The co-Leads of each TWG, working in close liaison with the Study Managers and the TWG members are expected to provide leadership and guidance in planning and delivering the work of their TWG as defined by the Study Board Work Plan. The co-Leads will organize meetings and conference calls; draft work plans; draft terms of reference and provide cost estimates for

required work; identify suppliers and sources; draft documentation for contracts; prepare written reports on completed work; and coordinate with other TWGs.

The co-Leads are responsible for ensuring that all deliverables are provided on time and within the approved budget. Meta-data will be required for all deliverables and activities will not be considered complete until this obligation is fulfilled with funding retained accordingly. (As a rule of thumb, twenty percent [20%] of funding will be retained until meta-data is provided).

Each TWG is expected to confirm its annual Work Plans and deliverables with the Board and Study Managers. Funding for the activities of each TWG, in accordance with its approved Work Plan, will be provided by the appropriate section of the Commission, in accordance with applicable government procedures and requirements.

Work that may be undertaken by other government agencies will be on the basis of well-identified products and deliverables, with timelines and itemized costs associated with the tasks. Such work may be according to a formal agreement, contract or memorandum of understanding as the case may justify. Such agreements will be concluded by the appropriate section of the Commission, in accordance with applicable government procedures and requirements.

Each TWG will submit a semi-annual activity report listing activities completed and products created during the reporting period in time to provide input to the Board's semi-annual Progress Report. The TWG will also submit a semi-annual report on expected deliverables that will be generated during the next period.

Each TWG should also keep abreast of the activities of the Board, TTs and other TWGs to ensure consistency in Board general procedures and guidelines, and to ensure best integration of the results of these groups towards the ultimate objectives of the Board and IJC.

SPECIFIC INFORMATION AND TASKS

There are two hydroelectric power plants located on the United States side of the St. Marys River. The U.S. Government Hydropower Plant consists of a plant completed in 1951 together with a smaller unit that is the remnant of a larger plant originally built in 1888. The other U.S. plant, which was built in 1902, is operated by Edison Sault Electric Company. In Canada, Great Lakes Power Limited retired its older station and constructed a new plant in 1982. In accordance with IJC Orders, after the requirements for domestic use, navigation, and St. Marys Rapids including the fishery remedial works are met, the remaining outflow from Lake Superior is shared equally between Canada and the United States for hydropower purposes. Any remaining flow allotment that exceeds the discharge capacity of the hydropower plants is normally released through the compensating works.

Since the redevelopment of the Canadian facilities in 1982, the total installed hydropower capacity on the St. Marys River has been increased. It is doubtful that there will be any significant hydropower expansion in the future. However, given the age of the Edison

Sault facilities, their eventual redevelopment should be considered in the review of the regulation criteria. Equipment upgrades in the future are expected to marginally improve the efficiencies of these plants.

There are no hydropower facilities on the St. Clair and Detroit Rivers. Several hydropower plants are located at Niagara Falls, New York and Ontario. These plants divert water from the Chippawa-Grass Island Pool above Niagara Falls, and return the water to the Niagara River below Niagara Falls. The amount of water available for hydropower purposes at these plants depends on the Niagara River flow which, in turn, depends on the water level of Lake Erie. The initial work efforts of the study would be focused more on the hydropower generation on the St. Marys River, where changes to Lake Superior regulation would have the greatest impact on hydropower operations. If, however, potential changes to Lake Superior criteria and regulation plan were expected to have measurable impacts on Lake Erie and its outflows, study tasks to include impacts on hydropower facilities at Niagara would be initiated.

The amount of hydropower generation on the St. Marys River depends on several factors, the key ones being head, flow, efficiency, tailwater level, river ice and aquatic growth, and meteorological disturbances. Apart from these physical factors, there are other elements that affect hydropower operations. The first element is timing. In some years, the water available for hydropower production in June may not generate as much monetary return as the same water in January when electrical demand is typically higher. On the other hand, hydropower would be a premium during a heat wave in June. When the flows are too low, the electricity generated may not meet the demands of the customers and the utilities may have to purchase power from other sources at relatively higher prices. The purchased power may be generated by coal, oil, or nuclear. Therefore, the purchasing power would involve transfer of monetary benefits and may have environmental implications. The move to an open market system means that reliability of water is essential for both long- and short-term planning purposes.

Relatively high water levels on Lake Superior means relatively higher flows, as directed by the regulation plan. This translates into more electricity generated. Relatively low water levels on Lake Superior would bring about the opposite condition. When the amount of water available for hydropower purposes exceeds the capacities of the plants, the excess is typically discharged into the St. Marys Rapids via the compensating works. This represents a potential loss to hydropower generation. Extended periods of equipment shutdown at the plant could also lead to additional water released at the compensating works.

To meet energy demand, which varies within the day and within the week, the hydropower plants in the St. Marys River carry out peaking and ponding operations. In peaking and ponding operations, the plants pass high flows during the daylight hours when energy demand is high, which they offset by using less water during the night and on weekends. Such adjustments are made, while ensuring plan flows are met on a monthly basis. These operations take place when the water allocated for hydropower

purposes is less than the flow capacity of the hydropower plants, and thus typically take place when Lake Superior's water levels and outflows are below average.

While beneficial to the hydropower interests, these flow variations have given rise to concerns by navigation, fisheries, and other interests in the St. Marys River. The concerns become more pronounced during low water level and flow conditions in the river. It is recommended that priority be given to address this issue. The impacts of peaking and ponding operations would be assessed early in the study, which would provide input to development of guidelines governing these operations, subject to confirmation at the completion of the study. The issue of peaking and ponding affects other resources as well. It is recommended that the Hydropower TWG lead the effort to examine peaking and ponding impacts. A small subgroup may be required which would include participation from the Ecosystems and Commercial Navigation TWGs as well as the Plan Evaluation TWG.

The Hydropower TWG should address the issues of climate change/variability and how hydropower may need to adapt in the future to respond to more extreme conditions than have been experienced in the past.

Tasks would include, but are not limited to the following:

- Evaluate in energy and monetary terms the impacts of peaking and ponding operations; provide inputs in developing guidelines governing peaking and ponding operations.
- Project hydropower facilities for the study period; determine their flow capacities and generating efficiencies.
- Update, and develop as required, evaluation methods that determine the relationships between energy production and flows.
- Investigate, and adapt wherever suitable, other evaluation techniques including those used in the International Lake Ontario - St. Lawrence River Study.
- Assist in identifying changes to regulation plans to improve operation.
- Evaluate the impacts of Lake Superior outflow regulation under a range of alternative regulation and supply scenarios, including those generated by climate variability and change.