INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

Canada
Mr. Jaymie Gadal, Member
Mr. Rob Caldwell, Secretary

United States
Ms. Debbie Lee, Alternate Member
Mr. Kyle McCune, Secretary

9 October 2014

MEMORANDUM TO INTERNATIONAL JOINT COMMISSION

Enclosed are the approved minutes of the Board's 24 September 2014 meeting in Cornwall, Ontario. We will post these to the Board Website as soon as possible.

Sincerely,

Enclosure

Rob Caldwell
Secretary, Canadian Section

DISTRIBUTION:
Mr. J. Gadal
Ms. S. Lobrichon
Ms. C. Mageau
Board Members
Mr. K. McCune
Regulation Representatives

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

Minutes of the 24 September 2014 meeting

The International Lake Superior Board of Control met on 24 September 2014 in the Heritage Room at the Best Western Plus Parkway Inn and Conference Centre in Cornwall, Ontario. Mr. Jaymie Gadal, Canadian Chair, chaired and convened the meeting at 1:05 p.m . The attendees were:

United States		Canada
	Board Members	
Ms. Debbie Lee (Alt.)		Mr. J. Gadal
	Secretaries	
Mr. K. McCune		Mr. R. Caldwell
	Regulation Representatives	
Mr. J. Allis (Alt.)		Mr. J. Bruxer
	Associates/IJC	
Mr. J. Oyler		Mr. R. Stefano
Mr. E. Tauriainen		Mr. J. Deluzio
Mr. P. Schmitigal (by phone)		Mr. D. Fay
Mr. J. Babb		Ms. W. Leger
Mr. M. Gabriel		Ms. J. Dickhout
Ms. C. Jarema		Dr. Y. Fan
Mr. A. Heer		Mr. A. Thompson

Item 1. Introductions
Chair Gadal initiated a round of introductions.

Item 2. Approval of Agenda
The agenda was approved as drafted.

Item 3. Adaptive Management Committee
Ms. Leger presented slides to provide an overview of the Great Lakes – St. Lawrence River Adaptive Management Committee (GLAM). On 19 September, the International Joint Commission (IJC) responded to the three Great Lakes Boards with a draft directive. Some Board staff requested additional time to provide comments on the start-up document and directive. The Board approved the directive.

Item 4. Update from Regulation Representatives
Hydrologic Conditions and Regulation Update
The Board was provided with the following update on hydrologic conditions for lakes Superior, Michigan-Huron, and Erie. Mr. Bruxer presented slides showing recent net basin water supplies, levels and flows (observed and forecasted), precipitation, climate outlooks, and Lakes Superior/Michigan-Huron water balance parameters. Highlights included:

- Observed two very wet Mays in a row (Lake Superior basin) and two very wet Aprils in a row (Lake Michigan-Huron basin).
- Observed a very cold, snowy winter.
- Lake Michigan-Huron daily mean water levels finally rose above long-term average on 7 September for the first time since the late 1990s.
- Lake Superior outflows are now expected to be on a downward trend for the remainder of this year.
- There was a maximum of seven gates equivalent open at the Compensating Works this summer.

Deviation Strategy Update
Mr. Bruxer then summarized the deviations strategy. High flows and hydropower maintenance had been expected this past summer. So on 25 April, the Board requested to deviate from May to December to reduce the

risk of high flows in the St. Marys Rapids. This is being accomplished using Plan 2012 as a guide, with flows below Plan 1977-A this past summer and above Plan 1977-A this past spring and later this year. The maximum gate setting was reduced from 12- to 7-gates open equivalent by deviating from Plan 1977-A.

Item 5. Hydropower Issues

Future Deviations to Smooth Flows

Mr. Bruxer raised the issue of deviating from Plan-prescribed flows in the future in order to smooth flows. This would provide benefits in the St. Marys Rapids, resulting in more consistent and more natural flows. Consideration must be given to whether the potential benefits gained in the Rapids would outweigh potential negative consequences of any deviations. Small deviations do not have considerable impacts on lake levels, but can have significant impacts on flows in the Rapids, and perhaps on lower River flows. Board Members agreed that they would be most comfortable adhering to Plan-prescribed flows, but that it may be prudent to adaptively manage outflows in the future in certain circumstances, and that this issue may be considered in the deviation directive. Mr. Gadal added that he would expect to remain hesitant to deviate in the future due to the uncertainty related to impacts on stakeholders. Mr. Bruxer agreed, but suggested that deviations should still be considered on a case-by-case basis. Tools such as shared vision models can continue to be developed and adapted to assess impacts on stakeholders operationally, and this will be a key component of the GLAM work plan. Mr. Stefano pointed out that Brookfield Renewable Energy Group's (BREG's) three units are now about 35 years old and will be needing longer service periods over coming years, and since there are just three of them, when one goes out of service, it's a considerable impact compared to how it used to be with the former plant's turbines.

Expected Plant Maintenance and Other Outages

Brookfield Renewable Energy Group (BREG)

Mr. Stefano reported that they expect a three- to five-week outage in April 2015 (to complete the rotor arm repairs on Unit G3 during its annual inspection) as well as some ten-day outages from April until June 2015. The city's Public Utilities Commission will require a plant shutdown this Fall to facilitate the closure and decommissioning of the north City intake well located on BREG property. The date and duration of this shutdown have yet to be confirmed.

Cloverland Electric Co-op

Mr. Schmitigal reported that they expect no problems passing their allocations through April. The canal restoration project will resume in May, focussed on the downstream half near the water line. Flows will be decreased to approximately 18 to 19 tcfs (510-540 m^3/s) in May, June, September, and October.

U.S. Government Hydropower Plant

Ms. Jarema reported that outages are expected in October and perhaps November. Unit 1 will be out in early October for about one week. Unit 10 will have some preventative maintenance performed as well.

It was agreed that there is considerable benefit to the power entities providing the Board staff their expected outage schedules ahead of time each month.

Hydropower Allocations at High Flows

Mr. Bruxer pointed out that this issue has become a concern again recently and had not been much of a concern for the past decade or longer. As the maximum capacities of the Canadian and combined US plants differs to some degree, there has been some confusion between the Regulation Representatives' offices as to what constitutes "water available for hydropower" when the combined capacity of all three plants is exceeded, and the proper procedure for the Board to follow when allocating this available water between the two sides. With the higher water levels and higher flows in 2014, the maximum hydropower capacities have been allocated since spring, but with hydropower maintenance this year, there has been considerable water sharing between the power entities. The Regulation Representatives' offices agreed to revisit the allocation procedure process and ensure that it meets the conditions outlined in the Orders of Approval and meets the concerns of the hydropower entities. The agreed-upon procedure will then be documented in the Plan 2012 Operational Guidelines.

Item 6. Compensating Works

Inspections

Ongoing, routine, monthly inspections of the Compensating Works occurred in the past six months.

Mr. Stefano noted that the 12 to 18 September planned inspection to be conducted on the Canadian portion by BREG was postponed until 29 September.

Ms. Jarema reported that the July Periodic Inspection conducted on the U.S. portion performed by the U.S. Army Corps of Engineers (USACE) Detroit District found the Compensating Works facilities to be in good condition. However, there was considerable leakage reported from missing concrete around the gate seals and there was a build-up of rust reported on some of the gate gears (which had recently been exercised considerably for the first time in some number of years).

Maintenance: Recent & Planned

Ongoing routine maintenance continued. Mr. Stefano added that the recently-completed multi-year rehabilitation program resulted in the structure's satisfactory condition. Ms. Jarema pointed out that no major issues were found during the monthly inspections.

IWI Study and Use of Multiple Gates vs. Fully-Open Gates

Ms. Jarema reported that this work remains postponed due to the continuing high flows. Fisheries experts have indicated that the preferred times would be August. Mr. McCune will follow up with Dr. Colosimo regarding the expiry of funds. Mr. McCune will prepare another letter to the IJC to apprise them of the postponement, and provide an expected completion date. Mr. Fay suggested consideration be given to doing the study over a two-month period during July and August to possibly minimize impacts on fish and perhaps deviations.

Flow Estimates under Multiple Partial-Gate Setting

Although it was pointed out that there will be more wear and tear on both the gate sills and seals at partially-open gate settings, Mr. Bruxer noted that there are numerous benefits and that the Board has received much positive feedback during the past several months during which partial gate settings have been employed. Benefits include more natural flow in the Rapids, potentially more fish habitat slower gate changes, reduced vulnerability to ice issues, and more precise establishment of gate settings (than from full-gate equivalents) and less spillage as a result. Anglers have expressed varying preferences. Disadvantages are less certain, but include flow accounting/equations that are more cumbersome and which require further development and verification; sea lamprey trapping may be less efficient or the current strategy may require adjustment; and scouring issues may be a problem. Safety concerns were also raised, specifically the potential for disabled boats to be pulled towards and under partially opened gates, though it was noted that safety concerns exist at fully open gate settings as well.

This year, gates will likely be opened partially from May to November. Typically, up until this year, gates had been fully opened, and flows through these gates were estimated using equations suitable for free-surface flow. But partially-open gates require the use of sluice gate equations, like $Q = C \cdot L \cdot w \cdot \sqrt{(2 \cdot g \cdot h)}$. Coefficient (C) varies non-linearly with gate opening (h) and depth upstream (y_1). The C value previously used for ½ gate setting (i.e., 0.62) is too high to apply to multiple partially-open gate settings and needs revision. May to August values were revised using a theoretical relationship from the literature. These have been verified using the Rapids flow measurements collected this year and using total St. Marys River flow data collected by the USGS, and the data will be further revised, if necessary, as more partial-gate measurements are made at the Compensating Works.

Item 7. Flow Verification Measurements

Ms. Jarema noted that flow measurements were performed at the Compensating Works in June and July during a period with partially-open gates settings, and another set of such measurements will be taken the week of October 6. Mr. Tauriainen added that other opportunities for such measurements will be considered.

The power plant measurement program will continue on a five-year cycle and will next be undertaken in 2015.

Item 8. Communications

2014 Meeting with the Public – Summary

Mr. Caldwell reported that the Board hosted a public teleconference/Webinar on 17 June, holding an afternoon and evening session. About 9 people participated, including members of the public, media, plus government officials, Board Members, staff, and associates. This was a small turnout compared to recent years. No concerns were received and only questions of a technical nature were asked by attendees.

Following the Webinars, Board staff held a teleconference to discuss potential improvements. Some items discussed included focussing more on current conditions/operations and less on the historical background, better binational sharing of responses to questions and comments, use of a Board Webex/teleconference set up by Board (in lieu of one by the IJC), use of two lines (unmuted and muted listeners' lines), and possibly holding the afternoon and evening sessions on different days.

The date of next year's Webinars will be established at the Spring business meeting.

2014 Engineer's Day – Summary

Mr. Bruxer presented a few photos from the 27 June event, where 7000 people were estimated to be in attendance. The Board display was located in a tent between the locks and was well-attended. Hundreds of people made their way through the tent and viewed the Board's slide show, browsed the display and brochures, and discussed their concerns and interests with the Board's representatives in an informal manner.

A similar Board presence is planned at next year's event.

Public Comments/Feedback Received

Mr. Bruxer provided a summary of the public comments and feedback received to date. Most were either related to the recent Whitefish Island flooding concerns, anglers and Rapids flows (i.e., either disruption to fishing or sensitivity to flow in relation to breeding), Lake Superior water levels (both low and high levels a concern recently), implementation of Plan 2012 (concern as to the perceived delay in implementing the plan, as well as both apathy and optimism towards the plan's expected effects), or the need for mitigation measures in the St. Clair River (to offset the impacts of dredging and increased conveyance).

Mr. Bruxer also presented some photos showing the partial inundation of Whitefish Island this summer, and the visual difference in flows in the main Rapids between ½-gate (November 2013) and 6-gate settings (September 2014).

Mr. Bruxer included some photos of two recent wind events on 4 and 10-11 September. The former event caused flooding along the upper St. Marys River, whereas the latter caused significant flooding in the Marquette and Duluth areas, among others. Ms. Dickhout prepared plots showing water level changes surrounding the events. It was estimated that the return frequency for exceeding the observed water levels of the recent 4 September seiche event, based on an hourly maximum of 184.09 m at S.W. Pier gauge, was approximately 5 years.

Web Presence

Mr. Bruxer provided a brief synopsis of some recent Board Website improvements. The "Publications" section has been reorganized with some key information included for certain important documents such as semi-annual reports and meeting minutes. New content to the "Maps and Data" page is coming soon. Future work may include flow and water level data, forecasts, plots, etc. as well as linkages to an IJC GIS portal.

The Board Facebook page had 86 "Likes" recently (up from 46 in March), with a total reach of 1000+ for certain posts. However, there are still relatively few comments, except in certain shared posts.

Item 9. Other

US Flow Accounting Audits

Mr. Bruxer provided a summary of a June audit visit to each of the US flow facilities. The measurement and accounting procedures were reviewed at each location, and Board representatives discussed the roles and responsibilities, planning and scheduling of maintenance, forecasting, communications, etc. A tour of the Parks Canada site, BREG plant, and Whitefish Island were also made.

Two small under-reported flows were discovered: the USGP sluice and tainter gates, and ice flushing at the U.S. locks. The need for comprehensive inspections and level surveying of USGP water level gauges and a mitigation plan for equipment malfunction were also discussed. This will be reviewed with CEC as well. It would be helpful to receive advance notifications regarding any expected outages from the power entities, and any within-month updates should be disseminated to all Board affiliates. The power entities requested, and will receive from the Board, improved forecasting (extended to 12-month outlooks, and will include U.S. Slip levels). This also presented a good opportunity to review the procedures regarding hydropower allocations at recent higher flows and to review and update the Compensating Works gate log records. It was decided to follow up with the City Water Treatment Plant since the representative available during the visit was unable to speak to water usage/diversion.

An audit of the Canadian flow facilities will again be undertaken in 2015 since many of the people involved have changed. Some of these facilities were last visited in 2012.

Ms. Jarema reiterated that power canal flow measurements will be undertaken at all three entities in 2015.

Whitefish Island Update

Ms. Dickhout presented a recently developed HEC-RAS hydraulic model of the St. Marys Rapids. Previously, a HEC-2 model was developed during the 1990s as part of the Canadian Flood Damage Reduction Program. Specifically, the model was used to identify flood risk areas when Whitefish Island was transferred to the Batchewana First Nation (BFN), and the resulting 100-year floodline map was prepared and shared with BFN at that time. The intention of updating and adapting the HEC-2 model in HEC-RAS was to provide the Board, Commission, and BFN with an updated tool to estimate and predict flood risk areas given current and probable water levels and flow conditions. Now that a working model is available, the next step is to output the model to mapping software (ArcGIS) for visualization of impacts. At this time, the model does not simulate head losses from either of the bridges at the head of the river, or the Compensating Works. Therefore, the water levels observed at CHS gauge 02BF001 located above Sault Ste. Marie are higher than the simulated water levels at the upstream extent of the model. In order to use this gauge to verify the modelled upstream water levels, the structures would need to be added to the model's geometry. Alternatively, it would be ideal to use water levels measured just downstream of the structures. It was agreed that IWI measurements may help in this regard.

The Board and Commission staff confirmed they had not heard any more from Batchewana First Nation (BFN) since the visit of Whitefish Island by Mr. Gadal and Mr. Fay on 23 May. Mr. Gadal intends to send Chief Sayers another letter soon to reiterate the Board's concerns and strongly recommend BFN make immediate efforts towards mitigating its flood vulnerabilities on the Island. Ms. Lee added that commercial navigation interests have indicated their unwillingness to forego the benefits higher outflows yield by way of higher downstream water levels and will not accept a reduction in outflows to prevent flooding on the Island. Mr. Gadal noted that Lake Superior is also getting quite high but that by switching to Plan 2012, there should be a reduction in the number of gates prescribed by the plan in coming months. However, this does not mean the Board can prevent further flooding of the Island in the long-term, and ultimately, more serious flooding is inevitable.

Little Rapids Habitat Restoration Project

Mr. Bruxer reported that this was a NOAA Great Lakes Restoration Initiative project to restore flow and fish habitat in the Little Rapids area, within the St. Marys River Area of Concern. The proposal involves the replacement of the existing Sugar Island causeway with an up to 200-m wide box culvert to increase flow and restore lost habitat. The permitting is being reviewed by USACE Detroit District, and Environment Canada experts were also notified due to the potential boundary water impacts. Corps staff will follow up with the State Department to ensure that they are comfortable with the process being followed.

Plan 2012 Implementation
Mr. Fay initiated discussions by noting that implementation will take place in early January 2015 and the Commission will issue directives on deviating and peaking and ponding to the Board. A teleconference will be convened shortly in order to resolve any ongoing issues prior to the implementation date. Mr. Bruxer added that the maximum winter and maximum summer flows in the plan remain potential concerns. There also remain some minor issues related to the Coordinated Great Lakes Routing and Regulation Model version of the plan that need some clarification and adaptation to an operational model. Mr. Fay also requested that ice management be included in the new Operations Guide. The guide should be completed by the end of this calendar year.

Item 10. Review Semi-Annual Progress Report
Mr. Caldwell requested timely receipt of any additional comments or changes to the draft Semi-Annual Progress Report. He will incorporate changes, update the available data, and distribute advance copies to the IJC prior to its October meeting. Mr. Fay indicated that the IJC has requested Board reports by 3 October in electronic format.

Item 11. Next Meeting and IJC Appearance
The IJC Great Lakes Boards of Control Appearances have been scheduled for 8:30 to 10:30 a.m. on 22 October (a Wednesday, and the Superior Board is to be the last of the Great Lakes Boards to present). The IJC seeks issue-oriented discussions. The reception is scheduled for 6:30 p.m that evening. The Spring meeting and 2014 public meeting(s) will be determined at later dates via e-mail. The Spring IJC Appearances in Washington, DC, are scheduled for the week of 13 April 2014.

There being no other business, the meeting adjourned at 6:30 p.m.

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

BOARD MEETING
24 September 2014
1300-1700 hours

Best Western Plus Parkway Inn & Conference Centre
Heritage Room
1515 Vincent Massey Drive, Cornwall, ON K6H 5R6

Agenda

1) Introductions [Gadal]

2) Approval of agenda [Gadal, Caldwell]

3) Adaptive Management Committee [Leger, Lee]

4) Update from Regulation Representatives [Bruxer]
   a) Hydrologic conditions
   b) Regulation update
   c) Deviation strategy update

5) Hydropower Issues
   a) Future deviations to smooth flows [Bruxer]
   b) Expected plant maintenance and other outages [Stefano, Sellers, Schmitigal]
   c) Hydropower allocations at high flows [Bruxer]

6) Compensating works
   a) Inspections [Stefano, Sellers]
   b) Maintenance: recent and planned [Stefano, Sellers]
   c) IWI Study and use of multiple gates vs. fully-open gates [Jarema, Bruxer]
   d) Flow estimates under multiple partial gate setting [Bruxer]

7) Flow verification measurements [Tauriainen]

8) Communications
   a) 2014 Meeting with the public – summary [Caldwell, McCune]
   b) 2014 Engineer's Day – summary [Bruxer, Jarema]
   c) Public comments/feedback received [Bruxer, Jarema]
   d) Web presence [Bruxer]

9) Other business
   a) U.S. flow accounting audits
      i) Summary [Bruxer, Jarema]
      ii) Next Canadian audit [Bruxer]
      iii) Power canal flow measurements [Jarema]
   b) Whitefish Island update
      i) HEC-RAS modeling [Bruxer, Dickhout]
      ii) Communications [Gadal, Caldwell]
   c) Little Rapids Habitat Restoration Project [Bruxer, Allis]
   d) Plan 2012 Implementation [All]

10) Review semi-annual progress report [Caldwell]

11) Next meeting (March 2015 in U.S.) and IJC appearance (22 October 2014, Ottawa) [Caldwell]