

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

Minutes of the 5 September 2007 meeting

The International Lake Superior Board of Control met on 5 September 2007 in the conference room at Brookfield Power's business centre, Sault Ste. Marie, Ontario. Mr. Fay convened the meeting at 1:10 p.m. The attendees were:

United States

COL J. D. Drolet (Alt.)

LTC W.J. Leady
Mr. S. Thieme (Alt.)

Mr. C. Woodruff
Mr. D. Sawruk
Mr. J. Allis
Dr. M. Bain

Board Members

Secretaries

Regulation Representatives

Associates

Canada

Mr. D. Fay

Mr. R. Caldwell

Mr. R. Caldwell

Mr. V. Lundhild
Mr. T. McAuley

Item 1. Approval of Agenda

The agenda was approved as proposed.

Item 2. Update on Hydrologic Conditions and Regulation

The Board was provided with the following update on hydrologic conditions for lakes Superior, Michigan-Huron, and Erie, and Mr. Caldwell presented slides showing recent net basin water supplies, levels (observed and forecasted), and Lakes Superior/Michigan-Huron water balance parameters.

- Water supplies to the Lake Superior and Lakes Michigan-Huron basins in the past six months were generally below average. New record low 12-month Lake Superior NBS were set in every month of the reporting period.
- Lakes Superior and Michigan-Huron levels are below average, and below levels of last year. Lake Superior was 42 to 54 cm (17 to 21 in.) below average during the past six months. Lakes Michigan-Huron were 39 to 58 cm (15 to 23 in.) lower than average. Levels of Lake Superior have been consistently below average since April 1998, while levels of Michigan-Huron have been consistently below average since January 1999. The August mean Lake Superior level was a new record low for the month, and the beginning-of-September level was also a new record. New monthly low records are expected to be set for at least the next several months.
- Lake Superior outflows were 69% of average over the past six months, and ranged from 1,280 to 1,560 m³/s, the "normal" minimum outflow prescribed by Plan 1977-A. Outflows were as specified by Regulation Plan 1977-A, and were limited by Criterion (c) from March to June. The gate setting at the Compensating Works was the equivalent of ½ gate open. Outflows are expected to remain at or below 1,560 m³/s for at least the next six months.
- Mr. Caldwell presented the Board with a range of projected levels for the next 6 months, along with slides showing how 2007 levels compare to the previous two years. With average supplies, Lakes Superior is expected to remain below or near the record low levels of 1925 and 1926. Michigan-Huron levels are very likely to remain below Chart Datum for the next six months, and record low monthly mean levels are possible this winter if dry conditions prevail.
- The 1900-1986 "standardized departure" data as used in Plan 1977-A show that Lake Superior's level was extremely low relative to Lakes Michigan-Huron at the beginning of September. Lake Superior was about 4.0 units below its mean level, while Michigan-Huron was about 1.6 units below its mean level.

- Since late 2005, Lake Superior has received over 220 mm (9") less total precipitation than normal.
- Much of the Great Lakes basin is experiencing drought. As of 28 August, much of the Lake Superior basin was experiencing extreme drought conditions.
- Mr. Thieme summarized the NOAA climatological outlooks. Conditions are expected to be warmer than average, with equal chances of wet, dry, or normal precipitation for the next few months.

The Board agreed that outflows specified by the regulation plan be continued.

In light of the expected unusually low outflows this winter, Mr. Sawruk, President of Edison Sault Electric Company (ESEC), explained the potential operational difficulties due to ice experienced last February during periods of very cold temperatures and low flows. He asked that the Board consider making a request to the International Joint Commission (IJC) to permit under-discharge deviations (i.e., flows less than those prescribed by Plan 1977-A) in October and November in order to store a limited amount of water on Lake Superior this fall that could then be used to increase outflows somewhat during cold periods this winter to prevent ice buildup in their plant. It was noted that any deviations would have to take into consideration any effects on other users and interests, including navigation. The Board agreed to further consider this request later this month.

Mr. Fay noted the possibility that Lake Superior may fall below the lower regulation limit of 182.76 m in the coming months. Mr. McAuley offered to look into whether the IJC would like special notification in such an event. He also noted that the IJC will likely be writing a letter to the Board soon seeking its opinion on what can be done regarding low levels on the Upper Lakes.

Item 3. Update on Long Lac and Ogoki Diversions

Ontario Power Generation (OPG) had provided the Board with an update on the discharges of the Long Lac and Ogoki Diversions. The Ogoki Diversions into Lake Nipigon (which flows into Lake Superior) averaged 135.6 m³/s (4,790 cfs) and the Long Lac Diversion averaged 40.5 m³/s (1,430 cfs) from March through August. Combined, these diversions were about 105 percent of average.

Additional average monthly discharges of 23.9 m³/s and 64.1 m³/s were spilled northward from Long Lake in June and July due to unusually heavy rainfall in the immediate area. Both the diversion and the reservoir were at their capacities and this action was taken to prevent local flooding.

Item 4. Flow Verification Measurements

Item 4a. Hydropower Plants

No flow verification measurements were undertaken in 2007. LTC Leady summarized the previous findings at the U.S. Government Plant (USGP). Results suggested an under-reporting error of 6-9% of the flow by the USGP. The source of the problem has been isolated to the plant's flow rating equations. A recommendation to address the under-reporting has been developed. Mr. Thieme reported that ESEC has agreed to contract Hatch Engineering to review their previous calibration of the plants' reporting equipment, based on recent discharge measurements. This work is expected to be completed by the Spring of 2008 and additional flow measurements will be scheduled to verify the updated calibration.

Item 4b. Compensating Works

No flow verification measurements were undertaken in 2007 due to the low lake levels and maintenance work on the Canadian gates.

Item 5. Hydropower Plant Maintenance & Other Outages

ESEC: Mr. Sawruk reported that ESEC continues to consider work related to extension of the life of their hydropower plant and prolonged outages may be necessary in the future. ESEC had analyzed an option to decommission the plant and expand the USGP structure, but that would cost approximately \$150 million, and was not considered economically feasible. They had decided to focus on work to extend the operation of the existing plant for the next 50 years, at an estimated cost of \$20 million. Limestone will be

placed in the power canal to line it over the next three years, and occasional plant shutdowns will be necessary for diver safety.

USGP: LTC Leady reported that Units 2 and 10 were off-line for short periods in March and April for maintenance. In May and June, flow was reduced temporarily to allow ESEC to work on a transmission line, and to reposition the log boom in the headrace. From 16 May to 22 August, Unit 10 was out of service due to mechanical problems, impeller cavitation, and failure of structural welds on the turbine. The unit was temporarily repaired with epoxy and placed back into service. A permanent repair or replacement plan is being developed, but the preliminary outlook is for May 2008.

Brookfield Power: During the reporting period, a series of scheduled maintenance outages were undertaken. Unit C1 was shut down from 19 March to 27 April and Unit C3 from 2 to 30 May. Mr. Lundhild reported that units are scheduled to be shut down on 6, 7, and 8 October to facilitate the annual underwater cable inspection for Lake Superior Power Ltd. (a cogeneration plant on Algoma Steel property). A Parks Canada effluent pipe along the tailrace wall will also be inspected at this time, and safety booms may be installed in the tail race as well if time permits.

The power entities were able to schedule their water use during the above mentioned shutdowns and reductions and the full monthly water allocations as specified by the Board were able to be released within each month. No problems related to water levels were reported as a result of the above flow variations.

Item 6. Compensating Works

Item 6a. Inspections

Routine inspections of the structure continued over the past six months. The structure remains in generally good condition. The periodic inspection of the American side was undertaken from 23 to 26 May. An underwater inspection with a remotely operated vehicle (ROV) was done at Gates 9 and 10. The remaining gates will also be inspected prior to winter if possible, once the refurbishment work on the Canadian side is completed for this season and the normal gate openings are re-established. Regular monthly inspections continued on the Canadian side.

Item 6b. Maintenance: Recent & Planned

Brookfield Power is undertaking a major repainting and refurbishment program of their portion of the Compensating Works between 2007 and 2010. It is expected that work on each gate will take approximately 30 to 45 days, with two gates at a time being worked upon each year, at a total cost of about \$1 million. Work on Gates 3 and 5 commenced on 3 July and is now expected to be completed by the end of October. Mr. Lundhild reported that this year's work was prolonged for approximately one month due to delays in the permit process. A dewatering structure was assembled at Gate 5, followed by a second one at Gate 3. Blast cleaning and repainting, replacement of any severely corroded steel, along with any necessary concrete repairs will be completed while the gates are dewatered.

LTC Leady reported that routine maintenance performed on the U.S. side of the structure included replacement of warning signs, touch up painting, repair of a roller assembly, and some brush clearing. Minor concrete patching, painting, and installation of new fencing will be completed shortly.

Item 7. Peaking and Ponding Update

Due to low levels in the lower St Marys River and low monthly outflows, ponding operations were restricted throughout the reporting period. Restrictions were expected to continue through the end of the navigation season. The Regulation Representatives consider the current protocol to be working well. No shipping delays due to ponding operations have been reported. The Board continues to include a semi-annual update on peaking and ponding in each progress report to the Commission.

Mr. Thieme reiterated that the power entities have stated that they remain disappointed with the Board's previous decision not to lower the threshold level for the suspension of ponding (from chart datum at U.S. Slip gauge by one foot (30 cm) to 176.09 m (577.71 ft.) on IGLD 1985). The lowering of the threshold had been previously deferred subject to an investigation into the concerns of possible effects on aquatic

habitat and species in the river expressed by the Michigan Department of Natural Resources. Mr. Caldwell noted that ponding could have been permitted in each of the past six months had the threshold been lowered, and it is possible that it could be permitted this fall based on expected conditions if the lower threshold level governed. It is understood that there is an economic impact on ESEC's customers in the Upper Peninsula of Michigan when ponding is restricted. ESEC had asked the Board to reconsider its decision, as it is their opinion that the concerns raised were anecdotal in nature and an ESEC-commissioned analysis by Dr. R. Marshall Werner, a Lake Superior State University scientist, led them to believe that the impacts on the St. Marys River, in particular, would likely be negligible.

As a means to resolve this matter, it was decided at the spring Board meeting to hire Dr. Mark Bain, a recognized expert from Cornell University, to seek his opinion. Dr. Bain's paper was one of the references cited in the original letter from MDNR.

Dr. Bain was contracted under the auspices of the Board and attended the 5 September meeting to present his findings to the Board. He reported that he had toured the lower St. Marys River by boat on 14 June and provided a copy of the photos he took during that tour. He had found reports of the biota living in this part of the river and did not believe any further field work was required in that regard. In his analysis, he had reviewed 43 hydropower peaking case studies in the literature and applied an environmental impact significance rating to each (as per Davies and Jackson, 2006; on a scale of 1=no impact to 6=severe impacts). Next, he developed a relationship between the ratio of high on-peak flow to low off-peak flow and the impact significance ratings for each case. He noted that the St. Marys River peaking ratio is typically 2, and never more than about 2.5 and, as a result, it falls into the "none to low" impact range. He also noted that the area on the lower St Marys with the greatest water level variation due to peaking was Soo Harbour, and that since the shoreline there consisted almost entirely of shore protection structures, there was little sensitive habitat to be affected. Further downstream he noted that the range of level fluctuations was even smaller and thus less significant. Dr. Bain concluded, "Hydro peaking as practiced is not a significant threat to the river environment and its biota." In his opinion, lowering of the threshold at which ponding is restricted will not have an impact.

Following Dr. Bain's presentation, the Board agreed to recommend to the Commission that the threshold level be reset as soon as possible to 176.09 m at U.S. Slip gauge. This will extend the range of levels at which ponding is permitted.

Item 8. Communications

Item 8a. 2007 Meeting with the Public Debrief

The Board reviewed the meeting with the public held the evening before on 4 September in Sault Ste. Marie, MI. The Board was pleased with the good overall attendance of about 62, 42 or so of which were members of the public or media. Commissioner Olson was present along with several IJC advisors, plus several IUGLSB Members and Associates. Clearly, residents remain upset about the continued low levels, and it appears many are not convinced by the Board's explanation that the ongoing drought, increased evaporation, decreased snowmelt, and increased water temperatures are the primary reasons. Several suggested alternative reasons, such as unreported diversions and consumptive uses, climate change, the St. Clair River "sink hole" (erosion of the riverbed issue), bulk withdrawals, etc. The Board discussed how best to present facts and figures in new ways to better explain matters, and many suggestions were put forward.

Item 8b. 2008 Meeting with the Public Planning

It was agreed that the plans for next year's meeting with the public would be confirmed at the March 2008 business meeting. The Canadian Member will lead the 2008 meeting.

Item 8c. Recent additional meetings with the public regarding low Lake Superior levels

Mr. Fay noted that he received similar questions and concerns as those from 4 September during two similar meetings he attended, held in Thunder Bay and Sault Ste. Marie, Ontario back in June (hosted by a local conservation authority and MP Tony Martin, respectively). The Board agreed that similar meetings may be helpful in 2008 if dry conditions continue.

Mr. Thieme added that USACE and Environment Canada hosted a teleconference with the media on August 28 in anticipation of setting a new record low Lake Superior level for August, and several Board representatives participated. The Corps' public relations officer received positive feedback, and is considering doing a similar teleconference monthly in the future. It was agreed that this effort was worthwhile this time, but unless the Lake was expected to hit an all-time record low it might not be necessary in the future, since the media has now been alerted to expected conditions.

Item 8d. Upcoming conference: "Making a Great Lake Superior", Duluth, Oct. 29-31

Mr. Thieme noted that there was originally a plan for a special IUGLS session, but it is believed this is no longer so. Messrs. Thieme and Caldwell have had their abstract accepted. They will present a paper describing Regulation Plan 1977-A and the current state of Lake Superior regulation. Mr. Fay inquired as to whether it would be possible to include a display, similar to the ones used at the meetings with the public. LTC Leady will look at the costs involved for the Corps to fund such an endeavour. Mr. Fay suggested that a component on the St. Clair River erosion issue be added to the presentation if the Study Board will not be giving a presentation. IUGLSB participation will be confirmed.

Item 9. Review Semi-Annual Progress Report

The Board reviewed and made some changes to the draft Semi-Annual Progress Report.

The Canadian Secretary will incorporate the changes, update the data, and distribute advance copies to the IJC prior to its October meeting.

Item 10. Other Business

Item 10a. Status of International Upper Great Lakes Study

Mr. Fay reported that several Board representatives will be attending the IUGLSB's first comprehensive scoping workshop in Burlington the following week. No communications officer has been hired by the Study Board yet.

Item 10b. Status of Great Lakes – St. Lawrence Seaway Study

LTC Leady noted that this study is essentially complete. The costs of maintaining the present navigation system over the next 50 years, along with the engineering aspects, were studied. Implications on the region's economy and the environment were also analysed. Final criticality rankings of various components have been prepared to focus more detailed reliability analyses on the most critical components. FY 08 funding will be used towards the next steps, which will focus on individual projects and improvements.

Item 10c. Status of Lock Replacement

A new "Poe sized" lock is proposed to replace the existing Davis and Sabin locks at the Soo Locks, to provide for more efficient movement of waterborne commerce. The total cost of the project is estimated at \$342 Million, with a 10-year construction window anticipated. LTC Leady noted that the FY 08 President's Budget did not contain funding for this project, and detailed design of the channel deepening, guide walls, and lock chambers remains on hold.

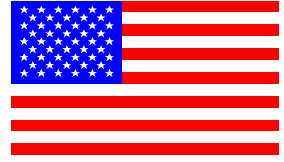
Item 10d. Board Membership Changes

Mr. Caldwell noted that Mr. Carr McLeod retired from Environment Canada on 24 April and resigned as Canadian Member. Mr. Fay was named his replacement effective 2 May and Mr. Caldwell now acts as the Canadian Secretary and Regulation Representative. Mr. McAuley noted that Mr. McLeod was presented with a plaque and a letter from the IJC to show their appreciation for his Board-related service.

Item 11. Next Meeting and IJC Appearance

The IJC Appearance has been scheduled for 1:00 p.m. on 17 October. The reception is scheduled for 6:30 p.m. that evening. The spring meeting will take place in the U.S. in March at a time and location to be determined. Mr. McAuley noted that the Spring IJC Appearances in Washington, DC, are scheduled for 15 to 18 April 2008.

There being no other business, the meeting adjourned at approximately 4:45 p.m.



INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

BOARD MEETING

**5 September 2007
1300-1630 hours**

**Board Room
Brookfield Power
Sault Hydro Business Centre
2 Sackville Road
Sault Ste. Marie, Ontario**

Agenda

1. Approval of agenda
2. Update on hydrologic conditions and regulation
3. Update on Long Lac and Ogoki diversions
4. Flow Verification Measurements
 - a. Hydropower plants
 - b. Compensating Works
5. Hydropower Plant Maintenance & other Outages
6. Compensating Works
 - a. Inspections
 - b. Maintenance: Recent & Planned
7. Peaking and Ponding Update
8. Communications
 - a. 2007 Meeting with the Public Debrief
 - b. 2008 Meeting with the Public Planning
 - c. Recent additional meetings with the public regarding low Lake Superior levels
 - d. Upcoming conference: "Making a Great Lake Superior", Duluth, Oct. 29-31
9. Review semi-annual progress report
10. Other business:
 - a. Status of International Upper Great Lakes Study
 - b. Status of Great Lakes–St. Lawrence Seaway Study
 - c. Status of Lock Replacement
 - d. Board Membership changes
11. Next meeting and IJC appearance