Meeting Minutes

2017 Annual Board Tour and Meeting, International Kootenay Lake Board of Control (IKLBC)

Thursday, October 19, 2017
Tour: 8:00AM to 12:00 PM
Board Meeting: 2:00 to 4:00 PM

Prestige Lakeside Resort, Nelson, British Columbia

List of Acronyms

CBRAC	Columbia Basin Regional Advisory Committee
IJC	International Joint Commission
IKLBC	International Kootenay Lake Board of Control
PCIC	Pacific Climate Impacts Consortium
USGS	U.S. Geological Survey
RMJOC	River Management Joint Operating Committee

	Canada	**United States**
Chair	Bruno Tassone (Host)	Col. Mark Geraldi
Members	Ted White	Kyle Blasch
Secretariat	Gwyn Graham	Kevin Shaffer
IJC Commissioners		Rich Moy
IJC Advisors	Wayne Jenkinson	Mark Colosimo
Guests	Darren Sherbot (BC Hydro), Dale Ernst (Fortis BC), Jamie King (FortisBC), Darren McElhinney (Fortis, BC)	

IKLBC Board Tour Summary (8:00 AM to 12:00 PM)

Board members visited the newly opened Fortis BC Operations Centre near Castlegar (BC) as well as the Fortis BC Corra Linn Dam and power generation station. At both locations, the group was guided by Fortis BC staff (Jamie King and Darren McElhinney) following relevant OHS and security briefings. The new Operations Centre consolidates all elements of Fortis BC operations, including the functions of the previous control centre that was located in Warfield (near Trail, BC). FortisBC operates the regional power grid, in addition to operating dams owned by FortisBC and other companies. At the time of the visit, the new Operations Centre had not yet been officially commissioned but Board members were able to view relevant elements of the generation and SCADA systems and observe the remote gate control systems for the different FortisBC Kootenay system projects, including the Corra Linn Dam. The Emergency Operations Centre for FortisBC is co-located in the same facility, adjacent to the System Control Centre. The Centre was scheduled for official commissioning on November 8, 2018. While on site, Jamie King (Fortis BC) provided an overview of the Fortis BC – BC Hydro Kootenay Canal Plant agreement, which allows BC Hydro to divert flow through their Kootenay

Canal generating station, by-passing a number of Fortis BC power plants along the Kootenay River before discharging further down the Kootenay River, but providing compensation to Fortis BC. Mr. King also explained that agreement includes coordination of the Waneta Project with Fortis Inc's Waneta Expansion project. Board members also conducted a site visit of the Corra Linn Dam on the Kootenay River, owned and operated by Fortis BC and subject to the 1938 IJC Kootenay Lake Order of Approval. Fortis BC staff guided Board members along the dam, explaining the flow control gate operations, as well as the generation/turbine plant and explained the Corra Linn dam upgrade project and the work that is planned for the spillway gates and dam superstructure replacement and other upgrades. Mr. King explained that it currently takes 3 to 4 hours to open spillway gates at Corra Linn, using a manually operated gantry crane. The refurbishments will speed this process in addition to retrofitting the spillway to meet recently upgraded seismic and safety standards.

Minutes of the IKLBC 2017 annual Board meeting.

Introductions:

Bruno Tassone (Canadian chair – IKLBC) welcomed and led roundtable introductions.

Guests: Darren Sherbot (BC Hydro), Jamie King (Fortis BC) and Darrel McElhinney (Fortis BC), Wayne Jenkinson (IJC Canadian section), Mark Colosimo (IJC U.S. Section).

Review of agenda:

Bruno Tassone led a review of the meeting agenda.

Board secretaries provided a review of minutes and actions from 2016 Board meetings.

Review of previous actions items:

1. Secretaries to provide Porthill/Queen's Bay gauge comparison with superimposed hydrographs.
2. Secretaries to seek Board input on the work plan by mid to late December.
3. Canadian Board Secretary to post Chris Frans (USACE) presentation slides from the 2016 Public Board meeting to the Board's website.

New Business:

The Board presented information on the following orders of new business:

- Overview of compliance with the IJC Order in 2017 (to date)
- Kootenay River Basin hydrology overview
- Brief description of the major dams regulating flow in the system
- Overview of key elements affecting Kootenay Lake levels – description of the Corra Linn Dam and Grohman Narrows effects on lake discharge and lake level.
- Explanation of the IJC Rule curve for Kootenay Lake; seasonal aspects of rule curve which limits maximum water levels on Kootenay Lake.

The Board reviewed applicant compliance of the IJC Order for 2017. Kootenay Lake level followed normal drawdown conditions through winter of 2017 until mid-March, when high inflows to Kootenay Lake from a combination of high rainfall (record-breaking precipitation events in Feb and Mar 2017) and reservoir draft at Libby Dam resulted in exceedance of the IJC rule curve. As a result of these conditions, water level elevation did not reach the low water level target of 1739.32 ft around the period of April 1st. Spring rise was declared on April 25th and Kootenay Lake water levels peaked at 1751.13 ft on June 9th. The Board reviewed upstream reservoir operations in order to understand the effects on Kootenay Lake levels. Duncan Dam reservoir experienced minimum levels in the middle of April (April 12) and maximum level on June 2nd, with an overall normal patterns of water level change (reservoir operations). Libby Dam (Koocanusa reservoir) experienced the minimum water level on May 5th and maximum level on June 22nd. Libby reservoir operations followed a similarly normal pattern. The Libby Dam refill started in the first week of May. VARQ discharge flows were followed with sturgeon discharge flows (pulses) from May 15-June 19.

The U.S. Board secretary, Kevin Shaffer, provide the results of analysis of high stage (water level) conditions on the Kootenai River at Porthill with comparison to periods of high Kootenay Lake level and high discharge (reservoir operations) from Libby Dam. The analysis was conducted following information that was provided to the Board by the manager of a large Hops farm in the Kootenai River flood plain downstream of Bonners Ferry (Idaho) regarding crop impacts and economic loss when Kootenai River stage reaches 1750 ft (USGS Porthill gage). The Board sought to better understand a potential connection between the Porthill gage and the Kootenay Lake hydrograph for times when the Porthill gauge reads at or above 1750 ft. The analysis showed that water level elevations (stage) of 1750 ft at Porthill and 1745.5 ft on Kootenay Lake occur in all but the driest years (19 of last 20 years). Flow release from Libby Dam of 30 kcfs occurs in about 35 percent of recent years (7 of last 20 years; noting that this occurred annually prior to Libby Dam construction). Kevin summarized that Porthill stage elevations exceeding 1750 ft. are most closely related to Queen's Bay elevations above 1746 ft. but can occur when Queen's Bay is as low as 1744 ft (and always occur when Queen's Bay is above 1748.5 ft.). These high stage conditions at Porthill (Kootenai River) also occur with any river discharge rate above 15 kcfs and with any Libby Dam outflow rate but will always occur when Libby Dam outflow exceeds 30 kcfs. Given the frequent occurrence for the variable conditions that can influence high Kootenai River stage at Porthill, it's not clear under what specific stage or seasonal conditions the instances of significant crop damage can occur. Additional follow up discussion with the affected farm(s) may be needed.

2016 Hydrological Conditions

The Board reviewed hydrological conditions on Kootenay Lake for 2017 to date. 2017 was one of the wettest water years on record for much of the Pacific Northwest. Several places broke records (Bonners Ferry third wettest with 32.16 inches, average is 21.8 inches; it was the wettest Oct-Apr period on record for Bonners Ferry, 28.92 inches beating 1974 record of 27.19 inches). January 2017 was exceptionally cold, freezing much of that high moisture content in the ground. February was another record wet month, followed by an extremely wet March and April, as well, leading to lower elevation run-off events and high elevation snowpack buildup. All

of this added up to a very saturated ground and a big snowpack. With the heavy March rain and big snowpack (approx. 130% of normal in May 2017), there was significant concern of potential flooding during the spring snowmelt season. Localized flooding did occur, particularly on the Canadian side of the Kootenay Basin but fortunately conditions allowed for a relatively normal snowpack melt rate and a major spring flooding event did not materialize. The summer period was very dry across the Kootenay(ai) Basin.

Darren Sherbot (BC Hydro) provided information to show that the Kootenay Basin broke 5 monthly precipitation records (3 high precipitation records and 2 low precipitation records). Stream flows were identified as currently extremely low downstream of Corra Linn Dam, despite an overall 122% of normal water supply for Kootenay Lake.

Jamie King (Fortis BC) provided a presentation by the Applicant, reviewing Kootenay Lake levels in 2017 to date, Corra Linn operations and planned upgrades at the dam. Corra Linn went into free fall to manage IJC curve during high inflow events in Nov 25 to 29 2016 (early winter) and winter Kootenay Lake level peaked at 1744.69 ft. on Dec 28th before draw down commenced. Corra Linn entered free fall on March 2, 2017 and drafted the lake to 1738.88 ft on March 13th but with increased Libby Dam discharge from March 15-19th and high natural inflows in the second half of March, the IJC Rule curve was exceeded as of March 20th although the Dam maintained IJC compliance by remaining in free fall through this period.

Jamie indicated that the BC Utilities Commission (BCUC) had approved the $63 million Spill Gate Replacement Project in February 2017. The scope of the Project is:

- Replacement of 14 existing spillway gates to meet the seismic and flood withstand recommendations of the BCDSR and CDSG;
- Reinforcement of the existing towers and bridges to meet seismic and flood withstand recommendations of the BCDSR and CDSG;
- Replacement of the existing hoists; and
- Replacement of the some of the existing embedded parts (gate guides, sill etc.)

Construction is anticipated to begin in July 2018 and end in 2021.

Wayne Jenkinson (IJC Canadian Section – Ottawa) provided an overview of Water Level and Water Management visualization models (and similar animation/graphical tools) that have been adopted by the Rainy-Lake of the Woods Board and Lake Ontario Board to better inform public knowledge of IJC water management activities and rules. There is IJC interest in having the International Kootenay Lake Board of Control develop a similar Kootenay Lake Water Level Visualization Model to better show how Corra Linn Dam and Grohman Narrows can affect water levels on Kootenay Lake.

2016-17 Work Plan Discussion

The Board reviewed current priority items,

1. Tracking progress of the Corra Linn dam upgrade project.
2. Follow up with relevant Kootenai Valley farming operations to better understand the relationship between high water events on the Kootenai River and crop damage events caused by flooding.
3. Explore further development of a Kootenay Lake water level visualization tool.

Bruno Tassone adjourned meeting at 4:00 pm.