

**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER** G-177-10



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**IN THE MATTER OF
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473**

and

**An Application by British Columbia Hydro and Power Authority
Hugh Keenleyside Spillway Gates Project**

BEFORE: L.F. Kelsey, Commissioner
D.A. Cote, Commissioner

November 25, 2010

O R D E R

WHEREAS:

- A. On July 16, 2010, British Columbia Hydro and Power Authority (BC Hydro) filed an application (the Application) with the British Columbia Utilities Commission (the Commission) under section 44.2(1)(b) for acceptance, pursuant to sections 44.2(3)(a) of the *Utilities Commission Act* (the Act), that capital expenditures BC Hydro anticipates making in respect of the Hugh Keenleyside Spillway Gates Project (Project) are in the public interest;
- B. The Project has an expected capital cost of \$90.2 million and authorized capital cost of \$102.0 million. The Project involves the refurbishment of four spillway gates and eight low level outlet gates at Hugh Keenleyside Dam with a target completion in December 2013. The Hugh Keenleyside Dam is located on the Columbia River about eight kilometres upstream of Castlegar and was completed in 1968;
- B. On July 30, 2010, the Commission issued Order G-125-10 which established the Notice of the Application and the Regulatory Timetable for a Written Public Hearing process having one round of information requests to review the Application under section 44.2 of the Act;
- C. Order G-125-10 directed BC Hydro to provide direct notice of the Public Hearing process to all identified First Nations;
- D. The review of the Application was completed on October 15, 2010 in accordance with the Regulatory Timetable;
- E. The Commission has considered the Application, evidence, and submissions of Interveners and BC Hydro.

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NOW THEREFORE the Commission orders, for the Reasons for Decision that is Appendix A to this Order, that:

1. The expenditures required by BC Hydro to complete the Project, as described in the Application, in the amount of \$90.2 million, are in the public interest in accordance with section 44.2(3)(a) of the Act.
2. The Commission determines that the duty to consult First Nations not triggered by the Project.
3. The Commission finds the three issues raised by the Sinixt Nation Society do not result in inadequate consultation.
4. BC Hydro is directed to file with the Commission semi-annual progress reports on the Project schedule, costs and any variances or difficulties that the Project may be encountering. The form and content of the semi-annual progress reports will be consistent with other BC Hydro capital project progress reports filed with the Commission. The progress reports will be filed within 30 days of the end of each reporting period.
5. BC Hydro is directed to file a final report within six months of the end or substantial completion of the Project. The final report is to include a complete breakdown of the final costs of the Project, a comparison of these costs to the Project Expected Cost estimate and provide an explanation of all material cost variances.

DATED at the City of Vancouver, in the Province of British Columbia, this 2nd day of December 2010.

BY ORDER

Original signed by:

D.A. Cote
Commissioner



IN THE MATTER OF

An Application by British Columbia Hydro and Power Authority
Hugh Keenleyside Spillway Gates Project

REASONS FOR DECISION

December 1, 2010

BEFORE:

D.A. Cote, Commissioner

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1.0 DECISION SUMMARY

The British Columbia Utilities Commission (Commission) accepts British Columbia Hydro and Power Authority's (BC Hydro) Hugh Keenleyside (HKL) spillgate system risk assessment and mitigation plan as being reasonable and consistent with good engineering practice to reduce the risks associated with a spillgate system failure and determines the proposed expenditures as outlined in the Application are in the public interest.

BC Hydro's assessment of the HLK Dam spillway gates system determined that the level of reliability of the gates is not sufficient to ensure reliable passage of water in a flood event or post-earthquake reservoir drawdown. The proposed project will address the condition and design deficiencies (such as common cause failures) and significantly reduce the risk of downstream loss of life, property and environmental damage associated with a failure of the existing spillgate systems (Exhibit B-1, p. 1-4).

2.0 PROJECT DESCRIPTION

The present radial and low level spill gates at HKL are 42 years old and are in serviceable condition. In accordance with BC Hydro's Reliability Principles developed for dam safety, the Project proposes extensive rehabilitation of the eight low level outlet gates, structural reinforcement and minor refurbishment of the four spillway gates, rehabilitation of all gate hoists, redundancy additions and upgrades to the associated power supply and controls for all gates, structural upgrades to the spillway gate hoist tower, and ergonomics and equipment access improvements (Exhibit B-1, pp. 1-3 to 1-4). BC Hydro submits that all proposed works are confined to the existing footprint on BC Hydro property and will have no new impacts or changes to First Nation's asserted rights or to water flows (Exhibit B-1, p. 1-5).

The project requires periodic closure of the publicly accessible dam roadway during construction. A mitigation plan for these closures was developed in consultation with public stakeholders (Exhibit B-1, p. 1-5).

BC Hydro submits that the Project is excluded from review under the Canadian Environmental Assessment Act and BC's Environmental Assessment Act. No changes will be required to the existing water license and the Project has received approval under section 88 of the Water Act and section 4(1) of the Dam Safety Regulation (Exhibit B1, p. 3-21).

BC Hydro proposes to commence detailed design and contract awards beginning July 2010 with a target In-Service Date of December 2013 (Exhibit B-1, p. 1-6).

3.0 NEED

The Commission accepts that HKL Dam is a Very High Risk Dam due to the risk to downstream population and property, determines that there are material deficiencies with the spillway gate systems and accepts the need for the Project.

In determining the need for the Project, BC Hydro considered the consequence category of a failure of the dam and undertook an assessment of the existing HKL Dam spillgate systems. The assessment identified several shortcomings with the facilities as benchmarked against a set of internal guidelines or ‘Reliability Principles for Flood Gate Discharge Systems’ (Reliability Principles) and recommended mitigation measures to bring the facility into compliance with the guidelines.

3.1 Consequence Assessment

The Commission determines that the HKL Dam is a Very High Consequence facility and concludes that an addition level of care is required at a facility that poses a high risk to the public if a dam breach were to occur.

BC Hydro subscribes to the Canadian Dam Association (CDA) Dam Safety Guidelines when rating the consequences of a dam breach. The CDA guidelines classify dams into one of five categories¹: Extreme, Very High, High, (all three have a permanent downstream population at risk and a dam breach is likely to result in significant property damage and fatalities in downstream communities), and Low and Very Low (where there is a temporary or no population at risk) (Exhibit B-1, p. 4-3).

The HKL dam is rated as a “Very High Consequence” dam meaning that in the event of a dam breach the downstream communities of Brilliant, Castlegar, Trail and several other communities in Washington State are likely to incur loss of life, property damage, significant financial impacts and environmental damage (Exhibit B-1, p. 1-4).

There is no evidence on the record disputing BC Hydro’s consequence categorization of the HKL Dam. Since a breach of the HKL Dam would potentially have severe consequences for residents and property downstream of the Dam, the Commission agrees with BC Hydro that the HKL Dam is a very high consequence dam.

Do to the potential consequences of a dam failure, the Commission concludes that additional measures of care are required at facilities that threaten downstream loss of life and private property.

3.2 Reliability Principles

The Commission has reviewed the Reliability Principles that BC Hydro has developed and accepts that the Reliability Principles are based on good engineering principles and provide a reasonable standard of care to benchmark the HKL Dam facilities.

BC Hydro submits that in the absence of an accepted industry wide Spill Gate Reliability approach to quantify or measure risk or reliability (where costs of improvements are directly compared against costs of consequences), it has developed its own set of Reliability Principles. These guidelines are also based on the CDA Dam Safety Guidelines to evaluate risk (Exhibit B-4, CEC 1.2.3). These Reliability Principles provide guidance on good engineering practices for the design, inspection, operation, maintenance, testing and training of personnel to ensure spillgates operate on demand to pass high inflows safely, up to the design flood. The Reliability Principles recommend that the design should be robust enough to cope with a single random component failure and tolerate a range of faults of the gate operating equipment, control or instrumentation to ensure the spillgate system will still remain operative (Exhibit B-1, Appendix F, pp. 7 of 35 and 9 of 35). Examples of failures

¹ For additional information on the consequence category of a dam-see “BC Hydro’s Dam Safety Management Manual” (Exhibit B-1, Appendix F, p. 6-35).

include, jamming of the gate(s) due to structural misalignment or collapse of the hoisting towers or drives, a fire destroying protection and controls, loss of the primary power supply and failure of the single backup generator to start, a failure of the gate hoist motor or a common cause failure such as loss of a cable tray serving multiple equipment.

The Reliability Principles were used to identify site-specific design and operational shortcomings and to develop mitigation measures to reduce the risk of uncontrolled water releases or dam failure associated with failure of the spill gate system (Exhibit B-1, Appendix F, pp. 5 of 35 to 6 of 35). Examples of mitigation measures include providing equipment redundancy with physical segregation, utilizing seismic qualified and diverse equipment based on proven technology and industry track record, providing independent systems, installing emergency bypass controls, employing simplicity of design and adherence to increased operator training, preventative maintenance and operational tests.

The Commission notes that there is no industry standard on which to benchmark spillgate facilities. BC Hydro developed its Reliability Principles based on the CDA Dam Safety Guidelines, to provide guidance on design and operation so as to deal with possible failure mechanisms and to develop failure mitigation measures. The Commission concludes that the Reliability Principles provide a reasonable standard of care for the HKL Dam.

3.3 Assessment Findings and Recommendations

The Commission has reviewed the HKL Dam assessment, determines that reliability enhancements are warranted and accepts the Project scope as being reasonable to increase the reliability of the spillgate systems.

The HKL Dam assessment recommends improvements, in accordance with the Reliability Principles, in the areas of seismic strengthening, equipment design and redundancy (Exhibit B-1, Appendix G, Hatch Report). The assessment also considers collated industry experience, knowledge and practice; current updates on dam performance during an earthquake and flood scenarios; and the impact of aging on the existing structures (Exhibit B-1, p. 1-2).

The Commercial Energy Consumers Association of British Columbia (CEC) submits that inclusion of a quantified “consequence mitigation” assessment is required for the HKL situation, however “CEC agrees that BC Hydro’s consequence mitigation steps are reasonable and appropriate” (CEC Final Submission, p. 2). BC Hydro replied that the main “focus is... on ensuring the spillway gates operate....to reduce the risk of such-consequences ever actually occurring” at this very high consequence facility (BCH Reply Submission, p. 3).

CEC also submits that inclusion of other potential failure scenarios (such as landslides and other upstream events) is critical to defining the probability of a failure and submits that BC Hydro should file this in evidence as part of the Commission’s approval process (CEC Final Submission, p. 3). BC Hydro replied that these additional risks can be considered under other mechanisms such as monitoring and need not be submitted as further evidence (BCH Reply Submission, p. 4).

The Commission has reviewed the Hatch report and has identified no reason to question the recommended scope for seismic strengthening; condition refurbishment; the addition of redundant and segregated systems; provision for increased environmental stewardship; and personnel safety/ergonomic enhancements. However,

the Commission suspects that the timing of the Project may be concurrent with the replacement of several wear items (such as bushings, axles and wire ropes) that are normally expensed. The Project, in part, is justified due to equipment deterioration, which may be associated with underfunding of past maintenance budgets. The Reliability Principles increase the focus on maintaining assets, as even new assets need to be maintained to ensure design reliability. The Commission believes that going forward, BC Hydro should allocate maintenance funding to ensure components do not deteriorate prematurely and the Project realizes its economic design life.

The evidence submitted in the Hatch Report identifies several shortcomings that deviate from the Reliability Principles, and proposes mitigation measures to bring the facility up to a reasonable standard of care in keeping with the Reliability Principles.

Turning to the concerns raised by CEC, the Commission agrees that a quantified “consequence mitigation” assessment may be somewhat helpful when evaluating future spillgate applications, but shares BC Hydro’s belief that the main focus in the Application is on reducing the risk of failure at a very high consequence facility. Since the Project is limited to the remediation of the HKL spillgates, concerns about failures caused by upstream failures, such as landslides, are more appropriately considered in overall assessments of HKL Dam safety. The decision sequence that forms the basis for the Application is to determine that the HKL Dam is a very high consequence facility; that therefore the spillgates need to function reliably; and then to assess what is needed to provide reasonable assurance that the spillgates will operate reliably. The Commission believes CEC needs to clarify how the development of additional statistical information to quantify the results of consequence mitigation, would be of material assistance in determining if a project and application of this nature are in the public interest.

4.0 PROJECT COSTS

The Commission accepts the cost estimate in the Application as being a reasonable all inclusive estimate for the identified scope of work.

The Project expected capital cost is \$90.2 million and the authorized cost is \$102 million. The estimate includes engineering, procurement, construction, contingency, capital overhead, management reserve, inflation adjustments, project management, identification/definition phase funding, dismantling/removal and interest during construction. (Exhibit B-1, p. 1-5)

Operating costs are forecast to increase by \$140,000 annually due the installation of additional equipment. Rate Impact would be the highest at \$10.3 million (0.22 percent) in F2015 and will decline to \$6.3 million (0.06 percent) by F2035 (Exhibit B-1, pp. 3-19 to 3-22).

No Intervener commented on the technical components or costs associated with the Project.

The Commission has reviewed the cost estimate in relation to the work proposed and has not identified any issues with the estimate.

5.0 COMPARISON OF ALTERNATIVES

The Commission agrees with BC Hydro that it considered the risks and consequences of each option and with BC Hydro's choice to proceed with enhancing the reliability of the HKL spill gates to protect the public interest.

BC Hydro submits that decommissioning of the HKL is not an option as the Arrow Lakes Reservoir is an obligation under the Columbia River Treaty.

BC Hydro investigated the options of:

- doing nothing
- deferring the Project
- replacement of key components and refurbishment of existing components of the Spillway Gates system

BC Hydro concluded that the first two options do not satisfactorily address the underlying reliability concerns or meet safety objectives. The third option was chosen as the preferred alternative and the scope was limited to the level of safety investments that would result in proportional gains in safety. Higher levels of reliability could be achieved with additional significant investments in reconfiguring the mechanical equipment, but BC Hydro believes these are not warranted at this time based on current knowledge of the Probable Maximum Flood and Seismic risk (Exhibit B-1, pp. 4-8 to 4-9).

The British Columbia Old Age Pensioners Organization (BCOAPO) states that it is satisfied that BC Hydro has considered all the reasonable alternatives, chosen the appropriate option and supports approval of the Application (BCOAPO Final Submission, pp. 2-3).

The Commission concurs that doing nothing or deferring the Project would not be appropriate considering the very high consequence nature of the HKL Dam. The Commission concludes that BC Hydro has applied its Reliability Principles so as to address deficiencies that will significantly improve reliability of the spill gates while avoiding expenditures that will have a lesser impact on reliability.

6.0 FIRST NATIONS CONSULTATION

In this section the Commission will first deal with First Nations' consultation broadly, and will then respond to the matters raised by an aboriginal organization known as the Sinixt Nation Society (Sinixt). These Reasons for Decision will refer to the Sinixt as a First Nation, notwithstanding that there are outstanding questions whether the Sinixt are recognized as "an aboriginal people of Canada" as referred to in section 35 of the *Constitution Act, 1982* (BCH Written Reply, p. 11).

6.1 Broad Context

The Commission determines that the Crown's duty to consult First Nations is not triggered by the Project.

The duty to consult First Nations is triggered “when the Crown has knowledge, real or constructive, of the potential existence of the Aboriginal right or title and contemplates conduct that might adversely affect it” (*Haida Nation v. British Columbia (Minister of Forests)* 3 S.C.R. 511, 2004 SCC 73, para. 35). Specifically, the duty to consult is triggered when a current government action has the potential to affect Aboriginal right(s). “Prior and continuing breaches, including prior failures to consult, will only trigger a duty to consult if the present decision has the potential of causing a novel adverse impact on a present claim or existing right” (*Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, 2010 SCC 43, para. 49).

BC Hydro evaluated that the Project “will have minimal, if any, adverse impacts on First Nations” and considered that “the duty to consult (if there is a duty at all in the circumstances) would be at the low end of the *Haida* spectrum” (Exhibit B-1, pp. 5-4, 5-5).

To ensure that First Nations were provided with relevant information and to ensure its understanding of any adverse impacts on First Nations’ rights or interests, BC Hydro identified and contacted First Nations potentially affected by the Project: the Ktunaxa Nation Council (KNC); the Shuswap Nation Tribal Council (SNTC) and member bands; the Okanagan Nation Alliance (ONA); and the Sinixt. These groups were provided with notice of the Project, a copy of the Application and an invitation to discuss the Project and the adverse impacts it might have.

BC Hydro submits that in the process of providing information and discussions the First Nations have not identified any new adverse impacts specific to the Project. As well, the KNC, the SNTC and members bands and the ONA have not raised any issues or concerns about the Project (Exhibit B-1, pp. 5-4 to 5-11; BC Hydro Written Reply, pp. 8-18).

The Commission notes that the Project is confined to the existing BC Hydro property and there will be no changes to the present water license or to water flows. The Project is essentially a like-for-like replacement in order to enhance equipment reliability for the protection of downstream residents. The Commission sees no potential for any new or incremental adverse impacts to First Nations’ asserted rights as a result of the Project and consequently, the Commission finds that the duty to consult is not triggered by the Project.

The Commission considers BC Hydro’s practice of engaging with First Nations to provide information and discuss its assessment of new adverse impacts as sufficient.

6.2 Sinixt Issues

The Sinixt is the only aboriginal group to intervene in the Commission process and to submit that consultation was inadequate on the following three issues:

Issue 1: The Sinixt contends that “BC Hydro was obliged to determine the strength of claim as part of its assessment of the scope of the duty to consult and accommodate. It was inconsistent with the Supreme Court of Canada’s decision in *Haida*...for BC Hydro to abdicate from its responsibility to engage in that determination” (Sinixt Final Submission, para. 16).

BC Hydro submits that it had sufficient information from previous projects to understand strengths of claim on a preliminary basis (BC Hydro Reply Submission, p. 14). As well, BC Hydro submits that it considered the potential impacts of the Project to be minimal or low so regardless of the strength of claim the duty to consult, if it exists, would be low (Exhibit B-1, p. 5-5).

The Commission is aware that the Sinixt have engaged with BC Hydro and intervened in Commission proceedings for other projects including the Waneta Transaction.

The Commission finds BC Hydro had sufficient information from previous projects to understand the Sinixt's strength of claim on a preliminary basis. However, as determined above, the Project did not trigger a duty to consult, therefore a Commission finding on strength of claim is not required.

Issue 2: The Sinixt submit "[t]he Project reinforces and entrenches the continuous infringement and therefore the honour of the Crown requires consultation with respect to that continuation" (Sinixt Final Submission, para. 32, p. 16).

The Commission notes the Supreme Court of Canada in *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, 2010 SCC 43 confirmed at paragraph 49 that the duty to consult is triggered by current government action causing new adverse impact(s) on a present claim or existing right.

Accordingly, the Commission Panel finds the duty to consult is not triggered by an ongoing, continuous adverse impact on Aboriginal rights.

Issue 3: The Sinixt submit that the lack of capacity funding in the early stages of consultation has restricted the group from meaningfully determining the impact of the Project (Sinixt Final Submission, para. 34).

BC Hydro submits that the Sinixt received notification of the Project by letter dated May 10, 2010. By the time BC Hydro filed the Project Application with the Commission on July 16, 2010, the Sinixt had not responded to the letter or raised the issue of capacity funding with BC Hydro. BC Hydro asserts that they attempted to enter into discussions about capacity funding with the Sinixt by letter dated September 15, 2010. As of October 15, 2010, BC Hydro had not received a reply. BC Hydro further submits that they are not aware of any legal obligation to provide capacity funding to First Nations (BC Hydro Reply Submission, p. 17).

The Commission finds that the Sinixt had an opportunity to raise the issue of capacity funding at an early stage but did not, and subsequently, on September 15, 2010, BC Hydro attempted to discuss the matter of capacity funding with the Sinixt but received no response.

The Commission determines that BC Hydro was reasonable in its conduct with regards to the Sinixt and capacity funding.

Accordingly, the Commission finds that the three issues raised by the Sinixt do not result in inadequate consultation.

7.0 PUBLIC CONSULTATION

The Commission finds that the public has been adequately informed about the Project and since no issues have been raised about its execution, public consultation in relation to the Project has been adequate.

In August 2009, BC Hydro sent a Project newsletter to key stakeholders to inform them of the Project and to provide them with an opportunity to raise any issues or concerns. BC Hydro made a presentation to the Castlegar Mayor and Council in November 2009, which was also attended by the public and media. BC Hydro submits that “no project specific issues have been raised.” The Project will entail road closures over the HKL Dam in accordance with an established communication protocol with the City of Castlegar, the public and key stakeholders. A letter of support was received from the City of Castlegar on November 19, 2009 and no project specific issues have been publically raised as of the date of the Application (July 16, 2010). (Exhibit B-1, pp. 5-15 to 5-16)

Pursuant to Commission order G-125-10, BC Hydro published the Notice of Application and Stakeholder Workshop in The Province and Vancouver Sun newspapers on August 5th, 2010 (Exhibit B-2).

There is no evidence, other than that filed in the Application, that addresses Public Consultation and no members of the public have made submissions to the Commission expressing concerns about the Project.

8.0 COMMISSION DETERMINATION

The Commission accepts the expenditures required by BC Hydro to complete the Project, as described in the Application, in the amount of \$90.2 million, are in the public interest in accordance with Section 44.2(3)(a) of the Act.

In support of this conclusion:

- The Commission accepts BC Hydro’s evaluation of the HKL spillgate systems as being deficient to provide the level of care appropriate for a high consequence dam.
- The mitigation measures proposed in the Application are a reasonable level of care to address the identified short-comings in accordance with good engineering principles to reduce the level of risk associated with a HKL spillgate failure.

The Commission determines that the duty to consult First Nations is not triggered by the Project.

In support of this conclusion:

- The Commission finds that the Project does not have the potential to adversely impact the claims or rights of First Nations as the Project is confined to the existing BC Hydro property and there will be no changes to the present water license or to water flows.
- No First Nation has identified any new adverse impacts specific to the Project.

The Commission finds the three issues raised by the Sinixt Nation Society do not result in inadequate consultation.

In support of this conclusion:

- The Commission finds BC Hydro had sufficient information from previous projects to understand the Sinixt's strength of claim on a preliminary basis. However, the Project did not trigger a duty to consult, therefore a Commission finding on strength of claim is not required.
- The Commission Panel finds the duty to consult is not triggered by a continuous, ongoing impact.
- The Commission determines that BC Hydro was reasonable in its conduct with regards to the Sinixt and capacity funding.