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October 31, 2016

Commercial Energy Consumers Association of British Columbia
c/o Owen Bird Law Corporation
P.O. Box 49130
Three Bentall Centre
2900 – 595 Burrard Street
Vancouver, BC
V7X 1J5

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

Re: FortisBC Inc. (FBC)

Project No. 3698883

Application for the a Certificate of Public Convenience and Necessity for Replacement of the Corra Linn Dam Spillway Gates (the Application)

Response to the Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 2

On June 29, 2016, FBC filed the Application referenced above. In accordance with the British Columbia Utilities Commission (the Commission) Order G-107-16 setting out the Regulatory Timetable for the review of the Application, FBC respectfully submits the attached response to CEC IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

21. Reference: Exhibit B-5, CEC 1.2.3

> 2.3 What are the circumstances that likely caused the three spillway gates to have worse condition than other gates? Please explain.
>
> **Response:**
>
> During a visual inspection of the 14 spillway gates, three of the spillway gates 10, 11 and 14 were noted to be in worse condition than the other 11 spillway gates due to the level of corrosion observed. The rate of corrosion is not a linear phenomenon and over the 84 year life of the spillway gates, gates 10, 11 and 14 may have corroded faster than the other gates. The level of corrosion noted, however, was not significantly different between the 14 spillway gates, i.e. the three gates inspected only appeared visually different due to the non-linear corrosion rate.

21.1 Please confirm or otherwise clarify the CEC's interpretation of the above that although the 3 gates appeared visually to have experienced more corrosion than the other gates, the actual level of corrosion may be similar between the gates and this level of corrosion is sufficient to require replacement.

Response:

Although three of the gates appeared visually to have more corrosion, due to the non-linear corrosion rate, FBC confirms that the total level of corrosion on the 14 spillway gates is similar (Exhibit B-1-1, Confidential Appendix F1 page 7) because they are all of similar vintage and are exposed to a similar environment and operating condition. FBC also notes that the level of corrosion is only one of the contributing factors driving the replacement of the Corra Linn spillway gates.

22. Reference: Exhibit B-5, CEC 1.4.2 and 1.4.2.1 and 4.3

> 4.2 Did FBC undertake a competitive tendering process in the engagement of the engineering firm HMI?
>
> **Response:**
>
> FBC did not undertake a competitive tendering process in the engagement of HMI.
>
> **Response:**
>
> As described in Section 6.1 of the Application, HMI was selected based on their experience as a contractor to BC Hydro for similar spillway gate rehabilitation project currently underway, their extensive experience and reputation within Canada on similar projects, and their ability to complete the scope of the project. FBC considered that they had appropriate engineering experience and qualified engineering resources necessary to complete the scope of work.
>
> 4.3 What is the total expected cost of the preliminary engineering and support for the development of the Project Cost Estimate?
>
> **Response:**
>
> The total expected cost of the preliminary engineering and support done by external consultants for the development of the Project Cost Estimate is approximately $507,000, which is line 1 from Table 6-2 of the Application.

22.1 Does FBC's standard practices normally require a competitive tendering process for projects (cost estimates) of this size? Please explain and provide any threshold levels that FBC normally employs in its decision-making.

Response:

Decisions are made on the form of procurement most appropriate for a project (competitive bid, direct negotiation with multiple vendors or single/sole source) provided this decision is made at the authorized level of authority. In the case of the HMI sole source of $315,000 to assist in developing the CPCN Application, the internal process included approval from the executive level.

22.2 Are there costs associated with a tendering process that were saved by selecting HMI based on their experience? If so, please provide FBC's estimate of these costs.

Response:

Yes, FBC estimates there was a small cost savings to the Project of approximately $10 thousand associated with selecting HMI to assist FBC in developing the CPCN Application and the cost estimate, instead of tendering that part of the Project.

23. Reference: Exhibit B-5, CEC 1.18.1

> 18.1 Is HMI able to provide evidence of a strong track record in appropriately estimating project contingencies?
>
> **Response:**
>
> HMI is unable to disclose specific contingency estimates and actuals from other projects that it has been involved in because of the confidentiality of their customers' information. However, HMI is an established engineering and construction firm that has successfully executed complex projects in the past that are similar to the Corra Linn Project. FBC selected HMI to complete the AACE class 3 estimate based on their current experience with BC Hydro as explained in the Application, Section 6.1. HMI was first selected by BC Hydro in 2008 with the contract extended in 2010 and again renewed in 2016. FBC also sought the opinion of the consulting firm Hatch Ltd. whose personnel have worked closely with HMI over the past 10 years on the BC Hydro's spillway gate project. Hatch confirmed the technical and design capabilities of HMI.

23.1 The CEC does not require any customer information. Would HMI be able to provide high level dollar values and % variances for the contingencies in its last 10 projects?

Response:

HMI provided the following table:

Initial Contract Value ($)	HMI Construction Contingency (%)	% of Construction Contingency Utilized
4 700 000	2	100
15 000 000	5	90
31 400 000	10	75
17 000 000	3	100
14 900 000	4	60
29 900 000	5	65
49 730 000	4	80
5 100 000	5	100
22 600 000	6	100
23 400 000	4	30
13 800 000	5	100

23.1.1 If so, please provide.

Response:

Please refer to the response to CEC IR 2.23.1.

23.1.2 If no, please explain why not.

Response:

Please refer to the response to CEC IR 2.23.1.

24. Reference: Exhibit B-3, BCUC 1.2.3

Response:

FBC would like to clarify that the alliance terminology used in the Application was meant in a general sense to describe the relationship with the contractor. A more accurate characterization of the contracting model being contemplated by FBC with HMI is an Early Contractor Involvement (ECI) model, not an alliance model or solely one of the traditional project delivery methods such as Design Build Tender. The ECI model seeks to balance risk, price and control of a project. In its strictest sense it is a hybrid of both a Design Build project delivery method (where the contractor is selected at the early stages of a project as a collaborative partner) and an Open Book pricing system. FBC reiterates that a contract has not been established with HMI and their involvement to date has been limited to assistance in the preparation of the Class 3 estimate for the Project.

Each of the traditional project delivery methods has advantages and disadvantages and is widely used in Canada. The ECI model, however, has evolved as a useful project delivery method for projects with unique characteristics and is therefore well-suited for one of a kind projects and where the site conditions pose unique challenges (such as the type of lifting required and access to the Project site in this case) that are best addressed by a knowledgeable contractor at the early stages. In the ECI model, because of the collaborative nature, there is

24.1 Is the ECI model widely used in Canada? Please explain.

Response:

While the ECI model has not been widely used in Canada to date, it has been adopted in Canada for some large projects in the gas industry, oil industry and the hydro industry over the last 5 to 10 years. For example, BC Hydro employed the use of ECI on their gate replacement program in 2009. They have completed three projects to date and continue to use this contracting model. The ECI model has also been successfully used for a number of infrastructure projects in BC.

The ECI model was introduced in the United Kingdom in the mid-1990s primarily to address concerns with increased project cost during construction and a need to improve on quality by reducing defects. In a tendered model, actual project costs more often than not exceed the budget, primarily due to scope changes and a poor understanding of constructability by the estimator. Under an ECI model, the owner engages the construction contractor to develop the scope of works prior to finalizing the contract price so the construction portion of the estimate is completed by a fully qualified contractor with extensive knowledge and experience in the related field.

24.2 Please provide a comparison of the 'Open Book' pricing model with the ECI model.

Response:

Please refer to the responses to BCUC IRs 1.2.3 and 2.10.2, which explain that the Open Book Phase is one of two distinct phases within the ECI model. As such, the Open Book Phase cannot be compared with the ECI model.

24.3 When does FBC expect to select its construction model?

Response:

Please refer to the response to BCUC IR 2.10.2.

25. Reference: Exhibit B-3, BCUC 1.2.3

Advantages of an ECI model

The main advantages of implementing an ECI model for the Corra Linn Project include:

- The Company can select a specialized design/construction firm at the early stages of the project development process based on qualifications, experience and reputation, thereby leveraging the contractor's experience and knowledge at the onset of the Project. Once selected, the contractor provides preconstruction services, such as finalizing scope, evaluating alternatives and finalizing the schedule, concurrently with the design and planning services.
- The design and planning services are performed collaboratively with input from the entire project delivery team to establish a target price for the Project.
- Provides the Company an opportunity to review and test all assumptions as to design, cost, risk and schedule at an early stage.
- Under the Open Book pricing system the contractor must operate in an open, transparent and collaborative manner with FBC's team.
- It includes an understanding that FBC will have the ability to exercise an option for the construction of the Project. That is, the Design Build Phase is only agreed to when both parties agree with the target price and risk allocation determined in the Open Book Phase.
- Because of the collaborative development of cost and the equitable allocation of risks, savings are shared and effectively both parties participate in any gains/losses eliminating the need for a penalty/incentive mechanism.
- Because of the collaborative nature of the model there is less room for dispute; therefore communications between the parties are improved and there is less risk of contractual disputes and Change Orders.

25.1 Please provide a list of the disadvantages of an ECI model.

Response:

The main disadvantages of the ECI model and FBC's remedy to address each are as follows:

Disadvantage:

The ECI model requires increased owner's participation for longer durations during the Open Book Phase (OBP).

Remedy:

The increased demand on FBC resources during the OBP of the Project will be managed by engaging an Owner's Engineer to assist in the review process.

Disadvantage:

Items not competitively tendered have to be evaluated for cost competitiveness resulting in a larger draw on the owner's resources.

Remedy:

An Owner's Engineer will be engaged to participate in the OBP of the Project and provide recommendations to the FBC project team on the reasonableness of costs not tendered.

Disadvantage:

The traditional role of an engineer designer who would advocate on behalf of the owner is eliminated because a component of the design is completed during the design build phase.

Remedy:

An Owner's Engineer will be engaged to assist FBC in reviewing technical specifications and design.

25.2 Please provide an overview with details of the selection process that would be used to choose an ECI partner.

Response:

Please refer to the response to BCUC IR 2.10.2.

26. Reference: Exhibit B-3, BCUC 1.2.4

> 2.4 Please confirm that if FortisBC were to tender the main construction contract, it would be a fixed price contract. If, not please describe the nature of the tendered contract being contemplated.
>
> **Response:**
>
> Confirmed, if FBC were to tender the main construction contract, FBC anticipates that it would be a design build fixed price contract.

26.1 Could FBC reasonably use a contractor other than HMI for the ECI model? Please explain why or why not.

Response:

Yes, FBC could use a different contractor than HMI under an ECI model and FBC is not contractually obligated to enter into an ECI model at this time. As described in the response to BCUC IR 1.2.3, HMI's involvement to date has been limited to assistance in the preparation of the Class 3 cost estimate for the Project and to assist in the development of the CPCN Application.

FBC is contemplating HMI as the ECI contractor for the reasons set out in the response to BCUC IR 2.10.2. However, as described in that response, the Company has also engaged a management consultant to provide a recommendation on both the contracting model and contractor selection for the Project.

26.1.1 If yes, from approximately how many qualified companies could FBC expect to select from for obtaining an ECI partner? Please explain.

Response:

FBC expects that the same three or four contractors outlined in the response to BCUC IR 1.2.5 could be interested as a potential ECI contractor.

27. Reference: Exhibit B-3, BCUC 1.4.5

> 4.5 What would be the approximate cost to fully replace the spillway section of the Corra Linn dam with a modern design?
>
> **Response:**
>
> The cost to fully replace the spillway section of the Corra Linn Dam with a modern design was not contemplated and as such was not investigated. However, any design variation to the spillway section of the Corra Linn Dam, such as reducing the number of gates, or eliminating the gates and rebuilding the spillway to allow for overtopping is likely to be significantly more costly than the alternatives examined in Section 4.2 of the Application.

27.1 Please describe the differences between a 'modern design' and the design FBC is proposing.

Response:

FBC acknowledges that spillway gate design has advanced significantly since the 1930s when the Corra Linn gates were designed and constructed. However, the question from the Commission which referenced a 'modern design' (BCUC IR 1.4.5) did not explicitly clarify what style of gate design was being suggested. The cited 'modern design' could have been referencing either the construction of a different type of gate (radial gates, drum gates, flap gates, etc.) or alternatively modifying the number of gates present at the Corra Linn Dam.

While FBC did consider both the alteration of the gate type and the number of gates at Corra Linn, it is important to note that the concrete structure of the Dam itself is in good condition and does not require reconstruction or modification to meet the design flood or design earthquake requirements as specified in the BCDSR or CDSG. Consequently, the use of any gate style other than the current vertical lift gates would require costly modifications of the Dam's structure and spillways which would not otherwise be required. This is because the alternate gate types referenced above would not be compatible with the existing vertical lift gate slots.

FBC estimates the order of magnitude difference in capital costs that might arise by use of a 'modern design' gate to be in the order of two to five times the costs described in the Application. The lower estimate is for replacement of the existing gates with a new gate style but with no changes to the spillway dimensions, and the upper estimate is for the replacement of the spillway piers to allow installation of fewer, but larger spillway gates. Given these dramatically higher costs (as compared to the proposed Spillway Gate Replacement Option), FBC does not consider the use of any gate design other than the current vertical lift style to be a feasible option.

27.2 Are there any environmental or other benefits that would accrue from using a modern design? Please explain and provide quantification of any benefits that are quantifiable.

Response:

While there could be some environmental benefits that might arise from the use of a different gate design, the benefits would not outweigh the dramatically higher costs associated with the dam reconstruction that would be required. Please refer to the response to CEC IR 2.27.1

27.3 Can FBC provide an order of magnitude quantification of the difference in costs that might arise if a 'modern design' were utilized? If so, please provide.

Response:

Please refer to the response to CEC IR 2.27.1.

28. Reference: Exhibit B-8, BCOAPO 1.10.1 and 1.10.2

In the ECI model, the construction risks are collaboratively identified upfront and the risks are allocated to the party best able to manage or control the occurrence of the risk event, as indicated in the Risk Register at Confidential Appendix H.

Whereas, in the Design Build (DB) Tender, the contractor typically has full responsibility for all aspects of construction including: project management, managing, design and construction of the project, determining construction means and methods and selecting subcontractors and suppliers. The DB contractor would therefore best be able to manage all of the construction risks and allocates an amount in the lump sum contract price to account for the possibility of the risk occurrence. The owner pays for all risk allowances made by the DB contractor, regardless of whether the risk transpires or not.

Response:

In the DB Tender, the construction risk generally lies with the contractor and will form a component of their fixed bid price. In contrast, in an ECI model, FBC would bear some of the known construction risks, as shown in the Project Risk Register at Confidential Appendix H. In this approach risk quantification and the contingency amount is transparent. Please refer to the response to BCUC 1.2.3 and BCOAPO 1.10.1.

28.1 Is it the case that although FBC will bear some of the known construction risks under the ECI model, FBC would ultimately be better off because they would pay for all the risk allowances under the DB contract, but only pay if the risk transpires under the ECI contract? Please explain why or why not.

Response:

FBC confirms that known risks assigned to FBC will only be charged to the Project if the risk materializes. Under an ECI model, a risk register is jointly developed by the contractor and the owner to determine the probability of the risk occurring, the financial impact of the risk and to allocate a particular risk to the party best able to manage and control it. In a Design Build (DB) contract the contractor typically owns all of the risks that FBC assigns to the contractor in the tender and builds into the fixed price an allowance to mitigate all the assigned risks. The amount that FBC would pay to transfer these risks is not known. In a DB contract, FBC would pay the premium for the assigned risks whether they transpire or not.

28.2 Does the contractor have a reduced incentive to manage risks under the ECI contract than they would under the DB contract? Please explain and take into

consideration the requirement for the contractor to typically bid on the Design Build contract.

Response:

No, under both models the contractor would seek to minimize the impact of the risk occurrence as it is in their best interest to do so.