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January 23, 2019

Mr. Patrick Wruck  
Commission Secretary and Manager  
Regulatory Support  
British Columbia Utilities Commission  
Suite 410, 900 Howe Street  
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

**RE: Project No. 1598978  
British Columbia Utilities Commission (BCUC or Commission)  
British Columbia Hydro and Power Authority (BC Hydro)  
Application for Reliability Coordinator (RC) Registration with the  
Mandatory Reliability Standards (MRS) Program  
Responses to BCUC and Interveners Information Request No. 1**

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BC Hydro writes in compliance with BCUC Order No. G-7-19 to provide, as Exhibit B-6, its responses to BCUC and Intervener Information Request (IR) No. 1.

BC Hydro also takes the opportunity to provide comments on a few issues that have been raised in the IRs.

First, it appears that some participants in this proceeding are under the impression that there is a choice to be made between BC Hydro, and another entity, to fulfill the role of RC in British Columbia after September 2, 2019, when PEAK will no longer fulfill that function. That impression may have arisen from BC Hydro's Application, which compared and contrasted the fulfillment of that function by BC Hydro with other entities with a view to demonstrating the merits of BC Hydro's proposed registration. However, there is no choice to be made between potential RCs. BC Hydro is the only entity that has applied to be registered as the RC for British Columbia. Unless and until another entity applies to WECC to be registered for that function in accordance with the Rules of Procedure for Reliability Standards in British Columbia, the choice is between BC Hydro and no RC.

In response to BCUC IR 1.7.4 BC Hydro describes the consequences of it not being registered as the RC by September 2, 2019. In short, while there will be no immediate adverse consequences, the lack of an RC in British Columbia is fundamentally inconsistent with the MRS framework and so undermines its reliability purposes.

As described in response to BCUC IR 1.7.4, the critical path decisions to ensure a WECC review in May and thus an RC is in place by September 2, 2019 are i) determination by the BCUC whether it would like WECC to perform a full certification review of BC Hydro, or whether an assurance review will be sufficient, and ii) whether any other details of the WECC's review need to be determined. Those decisions are solely in the discretion of the BCUC, with the input of WECC as the BCUC thinks is necessary or desirable. However, BC Hydro believes they must be made by mid-February to ensure an RC is in place by September 2, 2019, bearing in mind the availability of WECC in May for a site visit and the 90 days in advance of the site visit WECC has described.<sup>1</sup> For convenience, BC Hydro refers to these decisions as the BCUC-WECC Decisions. The key IR responses that relate to the merits of the BCUC-WECC Decisions are BCUC IR 1.1.1, BCUC IR 1.7.1, BCUC IR 1.7.4 and BCUC IR 1.7.7. To be clear, BC Hydro prefers an assurance review, but confirms its understanding that either type of review under consideration would satisfy the September 2, 2019 target date.

BC Hydro is concerned that more process could jeopardize this timeline. The procedural conference scheduled for next Wednesday, January 30, 2019 was originally established to allow participants an opportunity to comment on FortisBC's proposed extension of time to file notice of intent to file evidence. As it turns out, that extension was granted and FortisBC is to provide its notice this Friday, January 25, 2019. Subject to the following caveat, BC Hydro confirms that it will not object if FortisBC chooses to file evidence. The caveat is that a decision by FortisBC to file evidence should not delay a resolution of the BCUC-WECC Decisions. That delay can only arise if in any evidence FortisBC files it argues for a particular resolution of the BCUC-WECC Decisions. In that circumstance it seems unlikely to BC Hydro that the BCUC can determine the nature of WECC's review in time to preserve the September 2, 2019 date (after allowing for the procedural conference, the filing of FortisBC evidence, IRs on that evidence, the possibility of rebuttal evidence by BC Hydro and then a BCUC decision). Accordingly, BC Hydro requests that if FortisBC does elect to file evidence that it state in its notice whether it will be arguing for a particular resolution of the BCUC-WECC Decisions. If it does intend to file evidence on that topic BC Hydro expects it will object.

BC Hydro believes that any other evidence filed by FortisBC could be considered in parallel to the WECC review in May of this year and thus does not jeopardize the September 2, 2019 timeline.

Finally, BC Hydro asks that the BCUC advise participants of the issues to be addressed at the procedural conference next week (assuming it still proceeds).

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<sup>1</sup> Pages 55, 68 and 69 of the Transcript of the BC Hydro Workshop on December 19, 2018.

January 23, 2019  
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Commission Secretary and Manager  
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For further information, please contact Geoff Higgins at 604-623-4121 or by email at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



Fred James  
Chief Regulatory Officer

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Enclosure (1)

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**1.0 Reference: Exhibit B-1, pages 1-2 to 1-3 (Table 1-1)**

1.1.1 Is BC Hydro the only party registered with the Commission for each of the following functions in BC: i) Balancing Authority, ii) Planning Authority/Planning Coordinator and iii) Resource Planner?

**RESPONSE:**

**As indicated in the January 1, 2019 B.C. Active Entities Report maintained by the WECC on behalf of the BCUC, BC Hydro is the only party registered with the BCUC for the functions of BA and PA/PC.**

**Regarding the function of Resource Planner, BC Hydro and FortisBC Inc. are both registered with the BCUC.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**1.0 Reference: Exhibit B-1, pages 1-2 to 1-3 (Table 1-1)**

1.1.2 If not, what other parties are registered for each of these functions and, in each case, how is co-ordination effected between the various parties responsible for the function in BC?

**RESPONSE:**

**As stated in BC Hydro's response to BCOAPO IR 1.1.1, FortisBC is also registered for the function of Resource Planner in B.C. in addition to BC Hydro.**

**The MOD-004-1, MOD-010-0, MOD-012-0, MOD-020-0, and MOD-031-2 Reliability Standards adopted in B.C. each contain one or more requirements that apply to Resource Planners. The Reliability Standards themselves contain requirements which govern coordination requirements between Resource Planners where applicable.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**2.0 Reference: Exhibit B-1, page 2-6**

Activities associated with the RC role include: “2. Identify, communicate, and direct actions if necessary to relieve reliability threats and limit violations in the reliability area”.

1.2.1 Does this aspect of the role of the RC include directing actions that would lead to capital expenditures by BC Hydro for new transmission facilities and/or transmission facility upgrades?

**RESPONSE:**

**No. This aspect of the role is meant to relieve reliability threats and limit violations in real time or in the next day planning horizon based on the capabilities of the existing BES.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.2.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**2.0 Reference: Exhibit B-1, page 2-6**

Activities associated with the RC role include: “2. Identify, communicate, and direct actions if necessary to relieve reliability threats and limit violations in the reliability area”.

- 1.2.2 Could this lead to a situation where BC Hydro (as transmission owner) would be using the “direction” provided by BC Hydro (as RC) to justify a particular transmission-related capital expenditure?

**RESPONSE:**

**It should be noted that the reliability performance and system limits of the BES are initially determined by staff performing the TP function. The transmission planning staff assesses the reliability performance and system limits under a wide range of probable contingencies over a time horizon of up to ten years in accordance with TPL Reliability Standards. These planning assessments are what determine the need for most transmission related capital expenditures. Reliability threats or limit violations identified by the BC Hydro RC would be dealt with in real time and would later be assessed by separate staff in BC Hydro that fulfill the role of TP to determine whether capital expenditures to address those circumstances were warranted. The justification for transmission related capital expenditures is largely based on either the need to replace aging assets or by the need to accommodate increased energy demand.**

**No prior RC has identified any reliability threats or limit violations that have led to the need for transmission related capital expenditures in B.C.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.2.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**2.0 Reference: Exhibit B-1, page 2-6**

Activities associated with the RC role include: “2. Identify, communicate, and direct actions if necessary to relieve reliability threats and limit violations in the reliability area”.

1.2.3 How will BC Hydro (as RC) ensure and demonstrate to the Commission and other interested parties the impartiality and independence of any such “direction”?

**RESPONSE:**

**BC Hydro RC staff will keep a record of any directives that are issued and of the resulting actions of any of the B.C. registered entities, including those of BC Hydro operating staff. Such a record will be available for review by the two proposed governance groups: the RC Registered Entities Oversight Group and the RC and BA/TOP Operations Working Group. As BC Hydro proposed on slide 23 of the BC Hydro Workshop Presentation (Exhibit B-3), the BCUC staff are invited to be a member of the RC Registered Entities Oversight Group.**



<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.3.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**3.0 Reference: Exhibit B-1, page 2-6 and 2-7**

Activities associated with the RC role include: "6. Direct revisions to transmission maintenance plans as permitted by agreements and 7. Direct revisions to generation maintenance plans as permitted by agreements."

Ahead of time tasks associated with the RC role include: "9. Directs GOs and TOs to revise generation and transmission maintenance plans that are adverse to reliability".

- 1.3.1 Does this aspect of the RC role mean that BC Hydro (as RC) will have an impact on the timing of the maintenance plans of other generation and transmission-owners in BC?

**RESPONSE:**

**BC Hydro in its role as RC may have an impact on the timing of maintenance plans of all generation and transmission owners in B.C. In order to preserve bulk system reliability, maintenance plans for generation or transmission facilities that lead to the unavailability of those facilities need to be coordinated well in advance of the planned maintenance. This coordination already takes place between BC Hydro as a TOP and other generation and transmission owners in B.C.**

**Occasionally the timing of maintenance related outages needs to be adjusted to manage restrictions that might result from unplanned outages or weather conditions. A directive from the RC to revise generation or transmission maintenance plans would likely only happen in real time or for day ahead operations where an unforeseen system condition has led to a need to defer a planned outage or to return equipment to service earlier than planned in order to preserve the reliability of the BES.**

**BC Hydro has never received a directive from PEAK or from earlier RCs to revise maintenance plans of its generation or transmission facilities.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.3.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**3.0 Reference: Exhibit B-1, page 2-6 and 2-7**

Activities associated with the RC role include: "6. Direct revisions to transmission maintenance plans as permitted by agreements and 7. Direct revisions to generation maintenance plans as permitted by agreements."

Ahead of time tasks associated with the RC role include: "9. Directs GOs and TOs to revise generation and transmission maintenance plans that are adverse to reliability".

1.3.2 How will BC Hydro (as RC) ensure and demonstrate to the Commission and other interested parties the impartiality and independence of any such "directions"?

**RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.2.3.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. 1.4.1 Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**4.0 Reference: Exhibit B-1, pages 3-6 to 3-8**

1.4.1 Please outline in greater detail the differences in the governance structure (i.e., reporting relationships and separation of RC operations from other activities) as between Alternative 1 (BCH has RC) and Alternative 2 (CAISO as RC) that resulted in the governance risk of Alternative 1 being rated as “low” whereas the governance risk of Alternative 2 being rated as “medium”.

**RESPONSE:**

The table below outlines the differences in governance structure and risk between Alternatives 1 and 2 and whether they are significant or not. From the perspective of B.C. registered entities, the most important factor to consider about Alternative 2 is that only BC Hydro, as an entity taking service from CAISO, would be allowed to have membership in the CAISO oversight committee. However, under Alternative 1 all B.C. registered entities will be allowed to participate in the RC Registered Entities Oversight Group.

Governance Structure Component	BC Hydro as RC	CAISO as RC	Significant Governance Difference or Risk (Y/N)
Reporting Relationships	RC Group Reports to Director T&D System Operations	RC group reports to VP Operations	N
Governance Structure	RC Registered Entities Oversight Group RC and BA/TOP Operations Working Group	Oversight Committee	N
Governance Authority	BC Hydro Subject to BCUC	CAISO board of governors subject to FERC	Y
Membership in Oversight Group(s)	Registered Entities in B.C.  BCUC	Only BAs or TOPs like BC Hydro that take RC service from CAISO can be members. No opportunity for other B.C. registered entities to join.	Y

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.1 Please outline how the budget (Table 4-3) for the one-time start-up costs was established. In particular, in developing the budget, did BC Hydro draw on the experience of other RC's in setting up their initial operations?

**RESPONSE:**

**Prior to establishing the budget of start-up costs BC Hydro performed a review of the Reliability Standards requirements that apply to the RC function; refer to Appendix B of the Application. Based on that analysis, BC Hydro determined a number of specific items that would be required to support the development of RC capabilities for B.C. These items are included in Table 4-3 of the Application. BC Hydro did consult with AESO and the Ontario Independent Electricity System Operator to determine what tools and processes they had in place to provide RC capabilities prior to finalizing the budget of start-up costs, and those consultations informed BC Hydro's Application.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.2 Is BC Hydro responsible for any of the costs incurred by WECC arising from the certification process?

**RESPONSE:**

**BC Hydro is not directly responsible for any the costs incurred by WECC arising from the certification process. BC Hydro expects that it indirectly funds WECC's certification process through BC Hydro's membership fees paid to WECC.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.2 Is BC Hydro responsible for any of the costs incurred by WECC arising from the certification process?

1.5.2.1 If yes, what types of costs is BC Hydro responsible for, what level of costs is included in the one-time start-up budget and what certification option (per Table 4-2) are these costs based on?

**RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.5.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.2.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.2 Is BC Hydro responsible for any of the costs incurred by WECC arising from the certification process?

1.5.2.2 How would the WECC costs that BC Hydro would be responsible for differ as between the three options set out in Table 4-2?

**RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.5.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.3 How would BC Hydro's own costs vary depending upon the certification option chosen?

**RESPONSE:**

**BC Hydro's estimated start-up costs are based on the assumption that BC Hydro would undergo an assurance review. These start-up costs are shown in Table 4-3 of Exhibit B-1.**

**A full certification would require additional involvement of staff responsible for CIP Standards in preparing for and participating in the full certification. This could add up to \$50,000 in additional labour costs for the start-up phase.**



<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.4</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.4 Please outline how the budget (Table 4-3) for the ongoing annual costs was established.

**RESPONSE:**

**Approximately 85 per cent of the pre-contingency budget for ongoing annual costs is allocated to BC Hydro staff. This amount was established based on the number and level of positions for the roles described in Table 4-1 of the Application using BC Hydro's Standard Labour Rates.**

**Estimates for licensing costs for incremental software purchases were obtained from vendors and amounted to \$0.28 million.**

**Minor amounts were budgeted for travel, ongoing collaboration with other RCs, and for building and equipment expenses.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.5.5</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 Reference: Exhibit B-1, pages 3-9 to 3-10; page 4-2, pages 4-4 to 4-5 and pages 4-7 to 4-8**

1.5.5 How did BC Hydro establish the staffing levels and individual staff positions that would be required for the RC function (per Figure 4-1)?

**RESPONSE:**

**BC Hydro established the staffing levels and positions required for the RC function by examining the compliance requirements and skill levels necessary to implement this function. In order to staff the RC function on a 24x7 rotating shift basis and meet the ongoing training requirements of the Personnel Performance, Training, and Qualifications (PER) Reliability Standards, seven RCs are required. A new job description was created for this role with a level assigned so that it would be attractive to internal staff or external candidates with significant years of operating experience.**

**In order to meet the requirements of the Interconnection Reliability Operations and Coordination (IRO) Reliability Standards to prepare day-ahead studies, daily operating plans, exchange information with other parties, and develop and enhance operating tools, three RC engineers are necessary. Whereas some organizations provide engineering support on a 24x7 basis, these engineers will work extended hours and provide on call coverage if necessary. These positions will be hired at either the senior or intermediate level.**

**A Compliance Engineer is required because of the significant amount of information that needs to be collected and analyzed throughout the year to ensure compliance with the requirements of the Reliability Standards. This position will be hired at either the senior or intermediate level.**

**An Administrative Assistant is required to provide support to the RC team. There will be a significant amount of reporting, documentation and revision of procedures and posting of information to manage.**

**A senior level managerial position was established to provide oversight over staff, policies, compliance, and external relationships. The manager is also acting as a project manager in the start-up phase to ensure the RC function is ready for operations by September 2, 2019.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.6.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**6.0 Reference: Exhibit B-1, page 5-3  
 Workshop Transcript Volume #1, pages 32 and 37**

At page 5-3 the Application notes that FortisBC will be subject to procedures developed by BC Hydro as RC.

During the Workshop BC Hydro indicated that procedures were being drafted and reviewed with impacted parties.

- 1.6.1 Please outline the nature of the procedures (developed by BC Hydro as RC) that FortisBC and other parties in BC would be subject to and impacted by.

**RESPONSE:**

**Please refer BC Hydro's response to FBC IR 1.11.1.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.6.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**6.0 Reference: Exhibit B-1, page 5-3  
 Workshop Transcript Volume #1, pages 32 and 37**

At page 5-3 the Application notes that FortisBC will be subject to procedures developed by BC Hydro as RC.

During the Workshop BC Hydro indicated that procedures were being drafted and reviewed with impacted parties.

1.6.2 Will all impacted parties have the opportunity to review the procedures that BC Hydro is drafting prior to finalization?

**RESPONSE:**

**Please refer to BC Hydro's response to FBC IR 1.11.1.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.6.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**6.0 Reference: Exhibit B-1, page 5-3  
 Workshop Transcript Volume #1, pages 32 and 37**

At page 5-3 the Application notes that FortisBC will be subject to procedures developed by BC Hydro as RC.

During the Workshop BC Hydro indicated that procedures were being drafted and reviewed with impacted parties.

1.6.3 What is process for resolving differences in views as to the content of the drafted procedures? Does the process involve a 3<sup>rd</sup> party (e.g., the BCUC) if necessary?

**RESPONSE:**

**Any initial differences in views as to the content of the drafted procedures will most likely be resolved with the BC Hydro RC Manager. Failing this level of resolution the issue can be taken to the RC Registered Entities Oversight Group which may include representation from the BCUC staff. Ultimately a complaint could be filed with the BCUC if earlier resolution were not possible.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.7.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 Reference: Exhibit B-1, pages 6-1 to 6-2  
 Workshop Transcript, Volume #1, pages 51-52**

At the Workshop BC Hydro indicated it was most of the way through the selection of the team of seven for the RC shift roles and that all of the people that have been shortlisted have existing NERC certification and most of them are at the RC level.

1.7.1 Are all of those short-listed currently BC Hydro employees?

**RESPONSE:**

**No. Some of the short-listed candidates were external and the recruitment process continues.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.7.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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At the Workshop BC Hydro indicated it was most of the way through the selection of the team of seven for the RC shift roles and that all of the people that have been shortlisted have existing NERC certification and most of them are at the RC level.

1.7.2 For those that are, in what areas of BC Hydro's organization do they come from and is NERC certification required for the positions that they currently hold?

**RESPONSE:**

**The short-listed candidates that are internal, and have NERC certification credentials at the RC level, come from T&D System Operations. They have existing roles performing the BA or TOP functions, where NERC certification credentials are required.**

**It should be noted that when NERC certification is referred to in the context of operating personnel it means that they have been certified through the NERC System Operator Certification Program and have maintained the ongoing annual training requirements. This certification is unrelated to the functional certification of an entity registering to become an RC, BA, or TOP.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.7.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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At the Workshop BC Hydro indicated it was most of the way through the selection of the team of seven for the RC shift roles and that all of the people that have been shortlisted have existing NERC certification and most of them are at the RC level.

1.7.2 For those that are, in what areas of BC Hydro's organization do they come from and is NERC certification required for the positions that they currently hold?

1.7.2.1 If yes, does the timing allow the employees that will be hired to replace those transferring to the RC Department to receive their NERC-certification before assuming their new responsibilities?

**RESPONSE:**

**Yes, there will be adequate time for employees who replace those transferring to the RC department to receive their NERC certifications. Several employees are already in the process of training and self-study to apply for their NERC certifications in anticipation of assuming new responsibilities.**



<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.8.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**8.0 Reference: Workshop Transcript Volume #1, pages 10-12  
 Exhibit B-1, pages 3-4 to 3-10**

During the Workshop BC Hydro identified two criteria (Capability and Public Interest) as the basis on which it should be assessed regarding its Application to be registered as the Reliability Coordinator.

In the Application, BC Hydro used four evaluation criteria (Reliability Benefit, Governance Risk, Implementation Risk and Financial) to evaluate the RC alternatives.

1.8.1 Can the four criteria used in the Application all be considered as being captured under either Capability or Public Interest?

**RESPONSE:**

**The purpose of the MRS provisions in the UCA is to ensure a reliable electrical system through Reliability Standards that are consistent across North America. The BCUC is obliged to adopt Reliability Standards in B.C. that are consistent with those in other jurisdictions, unless there is a compelling public interest reason not to. Similarly, the BCUC should issue requested administrative orders that further the adoption of consistent Reliability Standards, including the requested registration of BC Hydro as the RC for B.C., unless there is a compelling public interest reason not to. Please refer to BC Hydro's response to BCUC IR 1.1.1.**

**It is important to note that only BC Hydro has proposed to be registered as the RC for B.C. There is no request from any other entity to be registered for that function in B.C. and there is no choice to be made between BC Hydro and another entity. Moreover, it is apparent that the RC function is a necessary component of the B.C. MRS scheme, as evidenced by the number of Reliability Standards that are premised on its existence (please refer to Appendix B of the Application).**

**Each of the evaluation criteria BC Hydro discussed in the application is potentially relevant to consider the possibility that registering BC Hydro as the RC for B.C. may not be in the public interest. There may be other relevant evaluation criteria, but BC Hydro is not aware of any. Regardless, in BC Hydro's view the evidence regarding those criteria are to be given little weight. Conversely, the evidence regarding the capability criteria should be given significant weight, and the primary evidence the BCUC should consider in assessing this criteria is the WECC assessment later this year.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.8.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**8.0 Reference: Workshop Transcript Volume #1, pages 10-12  
 Exhibit B-1, pages 3-4 to 3-10**

During the Workshop BC Hydro identified two criteria (Capability and Public Interest) as the basis on which it should be assessed regarding its Application to be registered as the Reliability Coordinator.

In the Application, BC Hydro used four evaluation criteria (Reliability Benefit, Governance Risk, Implementation Risk and Financial) to evaluate the RC alternatives.

1.8.2 Does Public Interest involve any considerations beyond the four used as evaluation criteria in the Application?

**RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.8.1.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.9.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**9.0 Reference: Workshop Transcript, Volume #1, pages 31 and 36  
 Exhibit B-1, pages 4-1 & 4-6 and Appendix C**

BC Hydro states that the RC staff will be located at BC Hydro's existing control centers.

1.9.1 Are there any other functions carried out at the same control centres that require separation from the RC function based on either BC Hydro Standards of Conduct or the NERC Reliability Coordinator Standards of Conduct (Appendix C)?

**RESPONSE:**

**No. There are no staff that engage in retail or wholesale merchant functions (marketing function employees) in the control centres that would require separation from the RC function based on the BC Hydro Standards of Conduct or the NERC RC Standards of Conduct.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.9.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**9.0 Reference: Workshop Transcript, Volume #1, pages 31 and 36  
Exhibit B-1, pages 4-1 & 4-6 and Appendix C**

BC Hydro states that the RC staff will be located at BC Hydro's existing control centers.

1.9.2 If yes, are what are these other functions and what actions will be taken to ensure compliance with the relevant Standards of Conduct?

**RESPONSE:**

**Please refer to BC Hydro's response to BOAPO IR 1.9.1.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.10.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 Reference: Exhibit B-1, page 4-6 and Appendix C  
 Workshop Transcript, Volume #1, page 39**

The Application states: "All employees of BC Hydro that are actively involved in real-time transmission or marketing functions, or who have access to non-public transmission function information, are bound by an existing BC Hydro Standards of Conduct that prevents non-public transmission information from being released to market function employees before it is publicly available. Any new staff joining the RC team will also be bound by this Standards of Conduct. In addition, BC Hydro proposes that, if deemed necessary by the BCUC, it will adhere to a RC Standards of Conduct in a form adopted by the BCUC for use in B.C. and substantially similar to the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C".

1.10.1 Does BC Hydro have a proposal for a RC Standards of Conduct for use in B.C.?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.10.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 Reference: Exhibit B-1, page 4-6 and Appendix C  
 Workshop Transcript, Volume #1, page 39**

The Application states: "All employees of BC Hydro that are actively involved in real-time transmission or marketing functions, or who have access to non-public transmission function information, are bound by an existing BC Hydro Standards of Conduct that prevents non-public transmission information from being released to market function employees before it is publicly available. Any new staff joining the RC team will also be bound by this Standards of Conduct. In addition, BC Hydro proposes that, if deemed necessary by the BCUC, it will adhere to a RC Standards of Conduct in a form adopted by the BCUC for use in B.C. and substantially similar to the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C".

1.10.1 Does BC Hydro have a proposal for a RC Standards of Conduct for use in B.C.?

1.10.1.1 If yes, please provide.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.10.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 Reference: Exhibit B-1, page 4-6 and Appendix C  
 Workshop Transcript, Volume #1, page 39**

The Application states: "All employees of BC Hydro that are actively involved in real-time transmission or marketing functions, or who have access to non-public transmission function information, are bound by an existing BC Hydro Standards of Conduct that prevents non-public transmission information from being released to market function employees before it is publicly available. Any new staff joining the RC team will also be bound by this Standards of Conduct. In addition, BC Hydro proposes that, if deemed necessary by the BCUC, it will adhere to a RC Standards of Conduct in a form adopted by the BCUC for use in B.C. and substantially similar to the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C".

- 1.10.1 Does BC Hydro have a proposal for a RC Standards of Conduct for use in B.C.?
- 1.10.1.2 If yes, please outline how this proposal differs from the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.10.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 Reference: Exhibit B-1, page 4-6 and Appendix C  
 Workshop Transcript, Volume #1, page 39**

The Application states: "All employees of BC Hydro that are actively involved in real-time transmission or marketing functions, or who have access to non-public transmission function information, are bound by an existing BC Hydro Standards of Conduct that prevents non-public transmission information from being released to market function employees before it is publicly available. Any new staff joining the RC team will also be bound by this Standards of Conduct. In addition, BC Hydro proposes that, if deemed necessary by the BCUC, it will adhere to a RC Standards of Conduct in a form adopted by the BCUC for use in B.C. and substantially similar to the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C".

1.10.2 In BC Hydro's view would there be any issues with the BCUC adopting the NERC Reliability Coordinator Standards of Conduct for use in BC? If yes, what are they?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**



<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.10.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 Reference: Exhibit B-1, page 4-6 and Appendix C  
 Workshop Transcript, Volume #1, page 39**

The Application states: "All employees of BC Hydro that are actively involved in real-time transmission or marketing functions, or who have access to non-public transmission function information, are bound by an existing BC Hydro Standards of Conduct that prevents non-public transmission information from being released to market function employees before it is publicly available. Any new staff joining the RC team will also be bound by this Standards of Conduct. In addition, BC Hydro proposes that, if deemed necessary by the BCUC, it will adhere to a RC Standards of Conduct in a form adopted by the BCUC for use in B.C. and substantially similar to the NERC Reliability Coordinator Standards of Conduct, attached for reference as Appendix C".

1.10.3 During the Workshop reference was made to Hydro Quebec's standards of conduct with respect to the RC function. Please provide a copy and indicate how they differ from: i) BC Hydro's Standards of Conduct and ii) the NERC Reliability Coordinator Standards.

**RESPONSE:**

**The Hydro Quebec RC Code of Conduct is included in Exhibit C2-3, as Attachment 4 to FortisBC IR No. 1 to BC Hydro dated January 7, 2019.**

**The Hydro Quebec RC Code of Conduct follows a similar format and approach to the NERC RC Standards of Conduct to ensure the non-discriminatory/non-preferential treatment of users of the interconnected transmission systems. Both contain similar rules governing employee conduct. However, the Hydro Quebec RC Code of Conduct does not contain the requirement to post on its website a description demonstrating how RC employees operate independently from merchant employees required by the NERC RC Standards of Conduct, or notices of employee transfers between RCs and merchant function roles. There is also not a specific reference to the books and records being separate and available for audit. The Hydro Quebec RC Code of Conduct includes some additional information on reporting and investigations of deviations from the code.**

**BC Hydro has existing Standards of Conduct which are rules designed to prevent BC Hydro from providing non-public transmission function information to its affiliated marketing function employees involved in wholesale electricity sales, before it is publicly available to non-affiliated customers. The prohibited employee conduct in the Hydro Quebec RC Code of Conduct and the NERC RC Standards of Conduct is similar to that imposed under the existing BC Hydro Standards of Conduct. However, as stated in BC Hydro's response to BCUC IR 1.5.2., BC Hydro is proposing to adopt a separate RC Standards of Conduct.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**11.0 Reference: Exhibit B-1, pages 4-4 to 4-6  
 Workshop Transcript, Volume #1, page 44**

BC Hydro is recommending that an RC assurance review be conducted by the WECC that exempts certain standards that are already applicable to B.C. in its existing functions

1.11.1 BC Hydro proposes to form a new RC Department to carry out the RC function. Even if a standard is already applicable to BC in its other roles (e.g. Transmission owner/operator or Balancing Authority), does there not need to be some assurance that the staff in the newly formed RC Department is capable of carrying out these responsibilities as they apply to the RC function?

**RESPONSE:**

**Staff performing the RC function in the new RC Department will have been certified by NERC to the Reliability Operator level and will have demonstrated competency in applicable areas to ensure compliance with the PER-003-1 Reliability Standard. The NERC certification of staff is done by a formal examination and is maintained by meeting continuing education requirements. Competency must be demonstrated in areas such as (1) Transmission operations, (2) Emergency preparedness and operations and (3) Interconnection reliability operations and coordination. The certification and demonstration of competency is the assurance that an operator is capable of carrying out the responsibilities of the RC function.**

**The Reliability Operator certificate level is the highest level of certification and authorizes an operator to work in the RC, BA, or TOP function.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.12.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**12.0 Reference: Workshop Transcript, Volume #1, pages 46-47**

During the Workshop BC Hydro indicated that it would be February/March 2019 before the documents with respect to governance and independence were completed.

1.12.1 Does the February/March 2019 timing allow for any concerns regarding these documents to be addressed as part of this proceeding?

**RESPONSE:**

**BC Hydro does not believe that there are any issues with the timing of the informational filing of the governance documents, or any other material developed by BC Hydro in consultation with stakeholders, as part of this proceeding or on a for information only basis.**

**BC Hydro is requesting an administrative order that is consistent with and enables Reliability Standards previously adopted by the BCUC. BC Hydro believes that the nature of the relief sought does not warrant a lengthy or complex proceeding, and for these reasons BC Hydro prefers to file the documents referred to on an information only basis and not on the record of this proceeding.**

**BC Hydro notes it is not seeking approval of any of its governance documents, or any other material developed by BC Hydro in consultation with stakeholders as part of this proceeding, and therefore no order is required in relation to them. Also refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.12.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**12.0 Reference: Workshop Transcript, Volume #1, pages 46-47**

During the Workshop BC Hydro indicated that it would be February/March 2019 before the documents with respect to governance and independence were completed.

1.12.1 Does the February/March 2019 timing allow for any concerns regarding these documents to be addressed as part of this proceeding?

1.12.1.1 If yes, how does BC Hydro seeing the schedule for current proceeding accommodating such concerns?

**RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.12.1.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.12.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**12.0 Reference: Workshop Transcript, Volume #1, pages 46-47**

During the Workshop BC Hydro indicated that it would be February/March 2019 before the documents with respect to governance and independence were completed.

1.12.1 Does the February/March 2019 timing allow for any concerns regarding these documents to be addressed as part of this proceeding?

1.12.1.2 If not, how does BC Hydro see any concerns raised by other parties regarding these documents being addressed in fair manner that adheres to BC Hydro's overall schedule?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.13.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**13.0 Reference: Workshop Transcript, Volume #1, page 36**

During the Workshop, Mr. Steed indicated that as the manager of BC Hydro's Provincial Reliability Coordination Operations, he would be reporting to Paul Choudhury, the Utility's Director of Transmission Systems Operations.

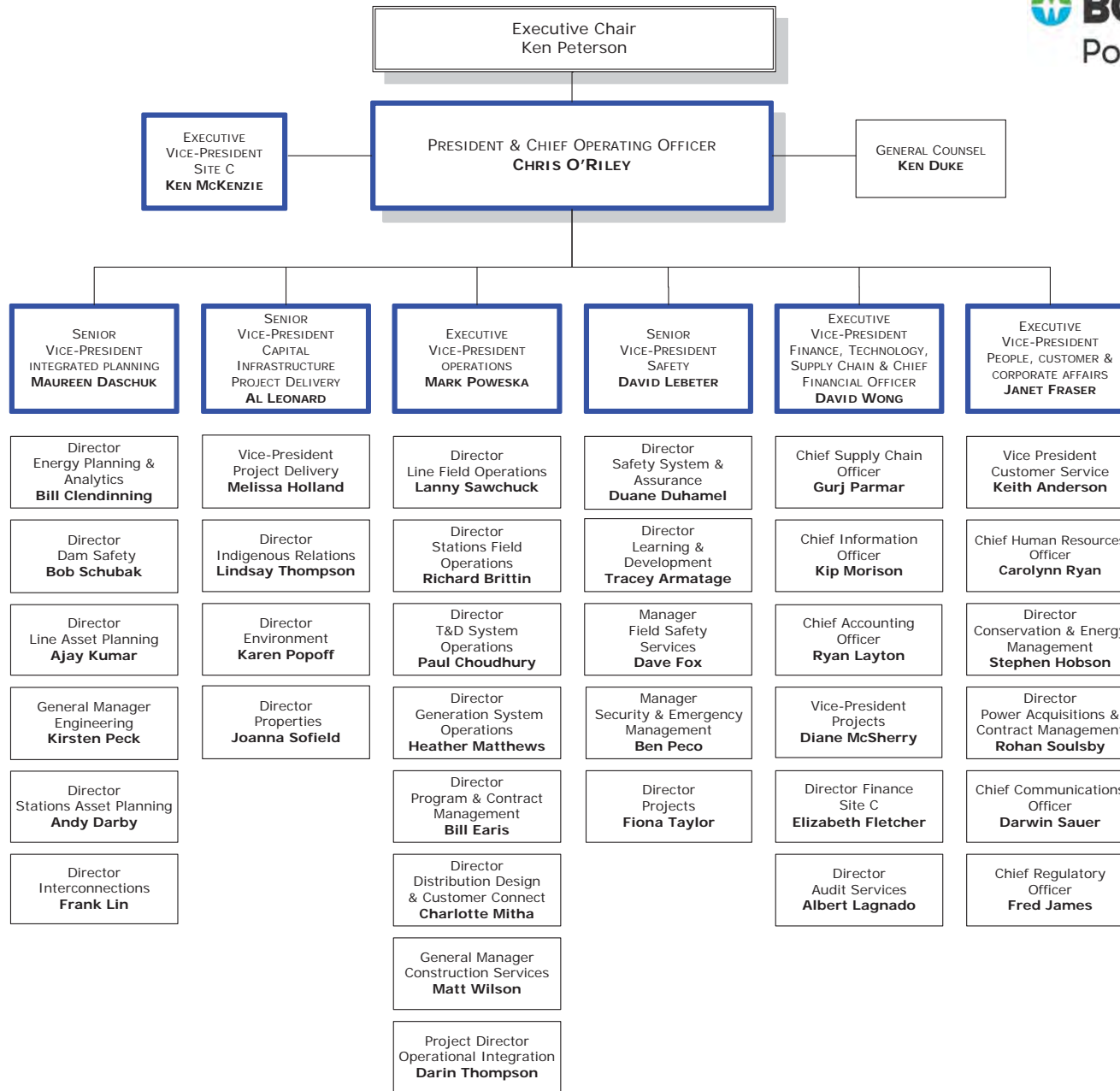
- 1.13.1 Please provide an infographic similar to the one reproduced below (BC Hydro 2004-2006 RRA, BCUC IR 1.83.1, page 6<sup>1</sup> showing where BC Hydro is proposing to site the MRS Reliability Coordination group within its organization.

**RESPONSE:**

**BC Hydro's RC group will be reporting to the Director of T&D System Operations. That business unit is shown on the chart provided in Attachment 1 to this response.**

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<sup>1</sup> [https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning\\_regulatory/rev\\_req/rev\\_reqs\\_9/bcuc\\_1\\_083\\_01\\_pdf.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/rev_req/rev_reqs_9/bcuc_1_083_01_pdf.pdf).



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<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.13.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**13.0 Reference: Workshop Transcript, Volume #1, page 36**

During the Workshop, Mr. Steed indicated that as the manager of BC Hydro's Provincial Reliability Coordination Operations, he would be reporting to Paul Choudhury, the Utility's Director of Transmission Systems Operations.

1.13.1 Please provide an infographic similar to the one reproduced below (BC Hydro 2004-2006 RRA, BCUC IR 1.83.1, page 6<sup>1</sup> showing where BC Hydro is proposing to site the MRS Reliability Coordination group within its organization.

1.13.1.1 Please show all lines of Communication that will be permitted between the MRS RC Group and other areas of BC Hydro's operations.

**RESPONSE:**

**The RC group, within T&D System Operations, is permitted to communicate with any other area of BC Hydro's operations. What is not permitted is the sharing of non-public transmission information with marketing function employees. Transmission function information that is publicly posted on BC Hydro's external website, or on BC Hydro's Open Access Same-time Information System (OASIS) or otherwise simultaneously available to all other BC Hydro transmission customers or potential transmission customers, is not restricted.**

**BC Hydro maintains a list of all market function employees and their respective departments so that all employees are able to follow the BC Hydro Standards of Conduct. There are presently a total of 61 marketing function employees.**

**Almost all of the RC communications are expected to take place within T&D System Operations with operators performing the functions of BA and TOP, with operating staff at registered entities in B.C., and with neighbouring RCs such as AESO and CAISO.**

**There will occasionally be communications with staff in the Regulatory Department on matters of Reliability Standards and compliance.**

**There will occasionally be communications with BC Hydro transmission and stations planning staff in the Line Asset Planning and Station Asset Planning groups in their role as TP.**

**Please also refer to BC Hydro's response to BCUC IR 1.5.2 and FBC IR 1.1.1.**

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<sup>1</sup> [https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning\\_regulatory/rev\\_req/rev\\_reqs\\_9/bcuc\\_1\\_083\\_01\\_pdf.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/rev_req/rev_reqs_9/bcuc_1_083_01_pdf.pdf).



<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.13.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**13.0 Reference: Workshop Transcript, Volume #1, page 36**

During the Workshop, Mr. Steed indicated that as the manager of BC Hydro's Provincial Reliability Coordination Operations, he would be reporting to Paul Choudhury, the Utility's Director of Transmission Systems Operations.

1.13.1 Please provide an infographic similar to the one reproduced below (BC Hydro 2004-2006 RRA, BCUC IR 1.83.1, page 6<sup>1</sup> showing where BC Hydro is proposing to site the MRS Reliability Coordination group within its organization.

1.13.1.2 Please show all lines of reporting between the MRS RC Group and any other areas of BC Hydro's operation.

**RESPONSE:**

**The RC group will be situated with the T&D System Operations Group. The immediate line of reporting will be to the Director of T&D System Operations. There is no other line of reporting to other areas of BC Hydro.**

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<sup>1</sup> [https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning\\_regulatory/rev\\_req/rev\\_reqs\\_9/bcuc\\_1\\_083\\_01\\_pdf.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/rev_req/rev_reqs_9/bcuc_1_083_01_pdf.pdf).

<b>British Columbia Old Age Pensioners' Organization</b> Information Request No. <b>1.13.1.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**13.0 Reference: Workshop Transcript, Volume #1, page 36**

During the Workshop, Mr. Steed indicated that as the manager of BC Hydro's Provincial Reliability Coordination Operations, he would be reporting to Paul Choudhury, the Utility's Director of Transmission Systems Operations.

1.13.1 Please provide an infographic similar to the one reproduced below (BC Hydro 2004-2006 RRA, BCUC IR 1.83.1, page 6<sup>1</sup> showing where BC Hydro is proposing to site the MRS Reliability Coordination group within its organization.

1.13.1.3 Please indicate specifically who or what positions within the BC Hydro organizational chart generated in response to 13.1 will have the power to investigate, discipline, hire or fire those within the BC Hydro MRS Reliability Coordinator Group, including Mr. Steed.

**RESPONSE:**

**The investigation, discipline, hiring or firing of any staff member at BC Hydro for human resource matters is performed by the direct manager of the staff member in collaboration with a Human Resources staff member.**

**Internal investigations based on compliance with the Reliability Standards can be performed by the RC Manager, the Reliability Compliance group in the office of the Chief Regulatory Officer, or by the Audit Services department. The latter two groups have no authority to discipline, hire or fire staff from the RC group.**

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<sup>1</sup> [https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning\\_regulatory/rev\\_req/rev\\_reqs\\_9/bcuc\\_1\\_083\\_01\\_pdf.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/rev_req/rev_reqs_9/bcuc_1_083_01_pdf.pdf).

<b>British Columbia Utilities Commission</b> Information Request No. 1.1.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**1.0 A. Reliability Coordinator functional registration by BC Hydro**

**Reference: Introduction  
 Exhibit B-1, Application, Section 1.3.3, p. 1-7  
 RC functional registration**

In its Application, British Columbia Hydro and Power Authority (BC Hydro) states:  
 BC Hydro submitted its application for registration as Reliability Coordinator (RC) with Western Electricity Coordinating Council (WECC) on September 4, 2018. The Registration Manual sets out the requirements for registration. BC Hydro notes that there is currently no formal administrative process to support registration as RC in B.C.

1.1.1 Other than the public interest test, does BC Hydro see any other parameters that the British Columbia Utilities Commission (BCUC) must consider in its assessment of BC Hydro's Application to become the provincial RC?

**RESPONSE:**

**In considering BC Hydro's application to perform the role and be registered as RC for B.C. the BCUC should give primary weight to the following parameters:**

- 1. The RC function is central to the MRS framework, as is apparent by the number of significant Reliability Standards that refer to or are premised on the existence of an entity that performs the RC function. Please refer to Appendix B of the Application (Exhibit B-1). The temporary lack of a registered RC in B.C. would not result in immediate adverse consequences, but over time the lack of an entity performing the RC function would be inconsistent with the statutory scheme regarding MRS in B.C.**
- 2. There is only one entity that has applied in accordance with the B.C. MRS Rules of Procedure to be registered for the RC for B.C., and that is BC Hydro. No other entity has applied to be the RC, and there is no choice to be made between BC Hydro and any other entity. In the circumstances the choice is between registering BC Hydro as the RC and having no RC for B.C.**
- 3. Registration of entities in B.C. is generally done on the basis of an assessment by WECC of the performance of the function by the entity or the capability of the entity to perform the function, depending on the circumstances. A recommendation as to whether the entity should be registered for the function is then sent to the entity and the BCUC, usually without any public process and without consideration of other parameters/criteria. That is, the assessment by WECC of an entity's performance of the function/capability is in almost all circumstances determinative of whether the entity should be registered. This approach generally serves the public interest by furthering the adoption of consistent Reliability Standards across North America.**

British Columbia Utilities Commission Information Request No. 1.1.1 Dated: December 21, 2018 British Columbia Hydro & Power January 23, 2019	Page 2 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

4. BC Hydro submits that as a matter of law the BCUC is obliged to register BC Hydro as the RC for B.C. unless there is evidence before it that the registration would not be in the public interest. Further, in weighing the totality of the evidence before it, and in considering whether the registration might not be in the public interest, the BCUC should give primary weight to the WECC's assessment of the entity's capability. The following paragraphs explain BC Hydro's positions in the context of the UCA.
  - (a) Under UCA section 125.2(6) the BCUC must adopt, by order, the Reliability Standards addressed in an assessment report filed by BC Hydro "if the commission considers that the reliability standards are required to maintain or achieve consistency with other jurisdictions that have adopted reliability standards." In effect, this provision imposes a lawful obligation on the BCUC to adopt Reliability Standards upon receipt of evidence demonstrating that they have been adopted in other North American jurisdictions. The scope of discretion afforded to the BCUC under UCA section 125.2(6) is quite limited; provided the evidence included in the assessment report regarding consistency is sufficient, the order would issue.
  - (b) However, UCA section 125.2(7) provides an exception to the BCUC's obligation under UCA section 125.2(6). It says that the BCUC need not require the adoption of a Reliability Standard if it "determines, after a hearing, that the reliability standard is not in the public interest."
  - (c) Given the default nature of the BCUC's obligation under UCA section 125.2(6) to adopt Reliability Standards, and the fact that it may not adopt a Reliability Standard only if it finds after a hearing that a standard is not in the public interest, it is apparent that a BCUC conclusion that a Reliability Standard should not be adopted would only arise in exceptional circumstances.
5. In BC Hydro's view the approach the BCUC is obliged to take in regard to the adoption of Reliability Standards should inform the approach it should take in regard to orders under UCA section 125.2(10), including the requested order registering BC Hydro as the RC for B.C. That is, the BCUC should issue administrative orders where to do so would further the adoption of consistent Reliability Standards across North America, and should refrain from doing so only when that particular public purpose objective is clearly outweighed by competing public interest considerations. It would be perverse to give the BCUC little discretion with respect to the adoption of Reliability Standards and then allow a broad discretion to deny requested administrative orders that would further those Reliability Standards.
6. Applied to BC Hydro's Application, the proposed approach means that the BCUC should give very significant weight to the WECC assessment of BC Hydro's capability to perform the RC function, and little weight to the other evidence, bearing in mind the necessity of a registered RC in B.C., and the fact that there are no alternatives before the BCUC. BC Hydro believes that this

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 3 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**approach would be consistent with the practice of registering entities in both the U.S. and in B.C., would be consistent with the legislative scheme regarding MRS in B.C., and would serve the underlying reliability objectives of that scheme.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.2.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**2.0 A. Reliability Coordinator functional registration by BC Hydro**

**Reference: Introduction  
 Exhibit B-1, Section 1.3.2, p. 1-6; Section 3.3.1, p. 3-5  
 RC functional registration - synergies**

On page 1-6 of the Application, BC Hydro states:

The 2007 British Columbia Energy Plan stated that, because the B.C. transmission system is part of a much larger interconnected grid, B.C. will need to work with other jurisdictions to maximize the benefits of the interconnections, remain consistent with evolving North American Reliability Standards, and ensure B.C.'s infrastructure remains capable of meeting customer needs. To address these objectives the provincial government amended the [*Utilities Commission*] Act on May 1, 2008 by adding section 125.2 giving the Commission jurisdiction to adopt MRS [Mandatory Reliability Standards] for application in B.C. and issued the MRS regulation.

On page 3-5 of the Application, BC Hydro states:

With CAISO [California Independent System Operator] being the RC for B.C. as well as much of the Western Interconnection it is anticipated that there would be synergies in having multiple BAs [Balancing Authorities] and TOPs [Transmission Operators] under the oversight of the CAISO RC for WECC-wide reliability issues.

1.2.1 Please describe the synergies that could be obtained in having multiple BAs and TOPs under the oversight of one RC. Specifically, do synergies relate to reduced costs in performing the RC function and/or increased operational efficiency (for example, identifying the lowest cost means of dealing with a reliability issue)? For any potential loss of synergy, please describe how BC Hydro could mitigate this loss.

**RESPONSE:**

**The synergies referenced in the above extract from page 3-5 of the Application are related to reliability issues that might arise across the wider Western Interconnection as opposed to reliability issues arising in B.C. or adjacent BAs. As an example, having a single RC responsible for B.C. and most of the rest of the Western Interconnection would mean that in the event of an interconnection-wide blackout only one RC would direct the restoration of the interconnection. All the BAs and TOPs would follow the lead of a single RC in executing their restoration plans. From an interconnection perspective this may be seen as an operational efficiency.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.2.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**As the RC for B.C., BC Hydro would have in place coordination agreements and restoration plans with other RCs such as CAISO to ensure that restoration is coordinated efficiently and safely for the benefit of the entire interconnection as well as B.C.**

**RCs identify constraints that can lead to reliability issues but they do not determine the lowest cost means of dealing with those reliability issues. If time permits, that cost determination would be made by the BAs and TOPs that are contributors to the reliability issue. If the constraint appears in real time then the BAs and TOPs that are contributors will follow the direction of the RC to alleviate the constraint.**

**Note that there is no proposal before the BCUC, or otherwise to establish one RC for the Western Interconnection.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.2.2 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 A. Reliability Coordinator functional registration by BC Hydro**

**Reference: Introduction  
Exhibit B-1, Section 1.3.2, p. 1-6; Section 3.3.1, p. 3-5  
RC functional registration - synergies**

On page 1-6 of the Application, BC Hydro states:

The 2007 British Columbia Energy Plan stated that, because the B.C. transmission system is part of a much larger interconnected grid, B.C. will need to work with other jurisdictions to maximize the benefits of the interconnections, remain consistent with evolving North American Reliability Standards, and ensure B.C.'s infrastructure remains capable of meeting customer needs. To address these objectives the provincial government amended the [*Utilities Commission*] Act on May 1, 2008 by adding section 125.2 giving the Commission jurisdiction to adopt MRS [Mandatory Reliability Standards] for application in B.C. and issued the MRS regulation.

On page 3-5 of the Application, BC Hydro states:

With CAISO [California Independent System Operator] being the RC for B.C. as well as much of the Western Interconnection it is anticipated that there would be synergies in having multiple BAs [Balancing Authorities] and TOPs [Transmission Operators] under the oversight of the CAISO RC for WECC-wide reliability issues.

1.2.2 Please describe the RC's role with regard to transmission planning, specifically with regard to maximizing the benefits (for both reliability and trade) of the interconnections.

**RESPONSE:**

**The role of the RC is focused on real time and near real time reliability of the BES. Generally, a reliable system is one that will allow for trade to take place within the limits of the system, however maximizing trade is never an objective of an RC.**

**Transmission planning for the purpose of adding transmission reinforcements to ensure the long term reliability of the BES, or to maximise the benefits of the interconnections, is a role that is performed by entities registered as TP or PA/PC.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.2.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 A. Reliability Coordinator functional registration by BC Hydro**

**Reference: Introduction  
Exhibit B-1, Section 1.3.2, p. 1-6; Section 3.3.1, p. 3-5  
RC functional registration - synergies**

On page 1-6 of the Application, BC Hydro states:

The 2007 British Columbia Energy Plan stated that, because the B.C. transmission system is part of a much larger interconnected grid, B.C. will need to work with other jurisdictions to maximize the benefits of the interconnections, remain consistent with evolving North American Reliability Standards, and ensure B.C.'s infrastructure remains capable of meeting customer needs. To address these objectives the provincial government amended the [*Utilities Commission*] Act on May 1, 2008 by adding section 125.2 giving the Commission jurisdiction to adopt MRS [Mandatory Reliability Standards] for application in B.C. and issued the MRS regulation.

On page 3-5 of the Application, BC Hydro states:

With CAISO [California Independent System Operator] being the RC for B.C. as well as much of the Western Interconnection it is anticipated that there would be synergies in having multiple BAs [Balancing Authorities] and TOPs [Transmission Operators] under the oversight of the CAISO RC for WECC-wide reliability issues.

1.2.2 Please describe the RC's role with regard to transmission planning, specifically with regard to maximizing the benefits (for both reliability and trade) of the interconnections.

1.2.2.1 Please explain how BC Hydro, in its role as the RC, would maximize the benefits of the interconnections.

**RESPONSE:**

**BC Hydro, in its role as RC, would be focused on the reliability of the BES which includes the interconnections. The transmission interconnections between B.C. and Alberta and B.C. and the U.S. provide strong reliability benefits as well as trade opportunities.**

**The BC Hydro RC's focus on the interconnections will be to ensure that flows on these paths are within their limits and that transmission and generation outages that affect these paths have been studied and coordinated. By ensuring the reliability of the interconnections, the RC is supporting the security of trade that takes place over the interconnections.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.2.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**2.0 A. Reliability Coordinator functional registration by BC Hydro**

**Reference: Introduction  
 Exhibit B-1, Section 1.3.2, p. 1-6; Section 3.3.1, p. 3-5  
 RC functional registration - synergies**

On page 1-6 of the Application, BC Hydro states:

The 2007 British Columbia Energy Plan stated that, because the B.C. transmission system is part of a much larger interconnected grid, B.C. will need to work with other jurisdictions to maximize the benefits of the interconnections, remain consistent with evolving North American Reliability Standards, and ensure B.C.'s infrastructure remains capable of meeting customer needs. To address these objectives the provincial government amended the [*Utilities Commission*] Act on May 1, 2008 by adding section 125.2 giving the Commission jurisdiction to adopt MRS [Mandatory Reliability Standards] for application in B.C. and issued the MRS regulation.

On page 3-5 of the Application, BC Hydro states:

With CAISO [California Independent System Operator] being the RC for B.C. as well as much of the Western Interconnection it is anticipated that there would be synergies in having multiple BAs [Balancing Authorities] and TOPs [Transmission Operators] under the oversight of the CAISO RC for WECC-wide reliability issues.

1.2.3 If BC Hydro was approved as the RC for BC, please describe the process of transitioning to a different RC provider at a later date, if required.

**RESPONSE:**

**If required, the process for transitioning to a different RC provider at a future date would be determined primarily by the requirements of the new RC provider.**

**As an example, transition processes might be as follows:**

- 1. Consultation with the BCUC and B.C. registered entities about the need and timeline for BC Hydro to deregister as RC for B.C. and the selection and appointment of an appropriate RC;**
- 2. Signing of a letter of intent and non-disclosure agreement with the new RC;**
- 3. Determine which services other than core RC services are required from the new RC;**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.2.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

4. Follow new RC's onboarding plan;
5. Support the new RC in any certification or assurance review processes required;
6. BCUC order appointing new RC for B.C.; and
7. Begin operations.

<b>British Columbia Utilities Commission</b> Information Request No. 1.3.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**3.0 B. RELIABILITY COORDINATOR FUNCTION ALTERNATIVES**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3, p. 3-4  
Evaluation and comparison of alternatives**

BC Hydro states the following in its Application:

The evaluation and comparison of Alternatives 1 and 2 have been performed on reliability benefits, governance, implementation risk and cost. The results are summarized in Table 3-1 below and in the subsequent sections in this chapter. For considerations other than cost, the alternatives were given a High, Medium or Low ranking for benefit or risk:

**Table 3-1 → Evaluation of Alternatives 1 and 2**

Alternative	Reliability Benefit	Governance Risk	Implementation Risk	Start-up Cost (\$million-CAN)	Annual Cost (\$million-CAN)
BC Hydro	High	Low	Medium	1.77 <sup>a</sup> –2.30	2.51 <sup>a</sup> –2.76
CAISO	Medium	Medium	Low	0.25–0.50	1.60–4.70

1.3.1 Please describe in detail BC Hydro’s method of assessing implementation risks for Alternative 1 and Alternative 2.

**RESPONSE:**

BC Hydro conducted an assessment of implementation risks associated with Alternatives 1 and 2 by first considering the defined scope of work for BC Hydro in each alternative and the timeline required for implementation.

Alternative 1 requires BC Hydro to perform more tasks to establish RC capabilities by the proposed in-service date. These tasks are related to people, process and technology. Assigning a ‘medium’ risk is based primarily on factors that may be outside of BC Hydro’s control impacting the completion of these tasks. Table 6-1 of the Application sets out the start-up risks associated with Alternative 1.

Alternative 2 requires BC Hydro to perform fewer tasks because CAISO would be taking on the majority of the activity to establish RC capabilities. The BC Hydro work would be primarily technology changes to support necessary data exchange with CAISO. As well, there would be some minor process changes in transitioning from PEAK procedures and agreements to CAISO. As such, BC Hydro deemed it appropriate to assign a ‘Low’ implementation risk to Alternative 2 from BC Hydro’s perspective. As noted in the filing, BC Hydro does indicate that the risk could increase as CAISO progresses in their work due to the significant amount of work involved in on-boarding all entities in a short time window.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**Note that BC Hydro's evaluation considerations were developed to decide if would apply to be the RC for B.C. They were not developed to allow a choice of RF. Only BC Hydro has applied to be the RC for B.C. and there is no other entity that can be chosen in place of BC Hydro.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.4.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**4.0 B. RELIABILITY COORDINATOR FUNCTION ALTERNATIVES**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.3, p. 3-8  
Implementation risk evaluation**

In its Application, BC Hydro states:

In evaluating the risks associated with the implementation of RC services, consideration was given to actions required by BC Hydro to support each alternative. These actions include the necessary people, process and technology changes that would support provision of RC services by the required dates.

1.4.1 Please provide any examples where a similar RC implementation plan and schedule has been devised and executed in other provinces.

**RESPONSE:**

**BC Hydro consulted with AESO in early 2018 as they had completed a transition to establish RC capabilities in 2013/2014. Prior to taking on the RC function, the AESO was already performing several reliability functions for the province of Alberta and was receiving RC services from WECC (predecessor to PEAK). As far as BC Hydro is aware, AESO is the only Canadian entity that has experience in receiving RC services from a U.S. provider and then transitioning to supplying their own RC service. AESO became RC in January 1, 2014, with the site visit for their NERC operational assessment in November 2015, and the final report being issued on December 30, 2015.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.4.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**4.0 B. RELIABILITY COORDINATOR FUNCTION ALTERNATIVES**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.3, p. 3-8  
Implementation risk evaluation**

In its Application, BC Hydro states:

In evaluating the risks associated with the implementation of RC services, consideration was given to actions required by BC Hydro to support each alternative. These actions include the necessary people, process and technology changes that would support provision of RC services by the required dates.

1.4.1 Please provide any examples where a similar RC implementation plan and schedule has been devised and executed in other provinces.

1.4.1.1 What learnings, if any, has BC Hydro incorporated into their implementation plan based on similar approaches in other provinces.

**RESPONSE:**

**BC Hydro learned of AESO’s approach to establishing RC capabilities and the process by which those capabilities were evaluated by a team led from NERC and WECC. AESO shared their experience of developing their existing technology to support RC capabilities. The primary tools developed included real-time contingency analysis and situational awareness tools.**

**The BC Hydro RC implementation plan incorporated learnings for both the approach to tools development (i.e., real-time contingency analysis and situational awareness tools) and the approach to engaging with WECC to perform an evaluation of RC capabilities.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
Governance risk evaluation**

On page 3-6 of the Application, BC Hydro states:

In taking on the function of the RC, BC Hydro will continue to make reliability and operational decisions independent of market influences and BC Hydro organizational structure. In addition, BC Hydro proposes that as part of the process of it being designated and approved by the BCUC as an RC functional entity in B.C. that BC Hydro will adhere to a RC Standards of Conduct in a form adopted by the BCUC. A copy of the NERC [North American Electric Reliability Corporation] RC Standards of Conduct are included as Appendix C.

BC Hydro states on page 3-7 of its Application: “BC Hydro as the RC for B.C. will address any issues and concerns raised by B.C. registered entities in a fair and non-discriminatory way, to ensure a positive outcome for the overall reliability of the province and the Western Interconnection.”

BC Hydro also states on page 3-7: “It is proposed that entities that plan to join CAISO’s RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC.”

In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.1 Has BC Hydro received feedback from BC registered entities to date confirming that BC Hydro currently makes reliability and operational decisions independent of market influences and BC Hydro organizational structure?

**RESPONSE:**

**BC Hydro has received no feedback from B.C. registered entities to date confirming that BC Hydro currently makes reliability and operational decisions independent of market influences and BC Hydro organizational structure.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.1 Has BC Hydro received feedback from BC registered entities to date confirming that BC Hydro currently makes reliability and operational decisions independent of market influences and BC Hydro organizational structure?

1.5.1.1 If so, please provide a detailed description of any feedback received to date.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.5.1.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.5.2 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**5.0 C. GOVERNANCE**

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 Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
 Governance risk evaluation**

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BC Hydro states on page 3-7 of its Application: “BC Hydro as the RC for B.C. will address any issues and concerns raised by B.C. registered entities in a fair and non-discriminatory way, to ensure a positive outcome for the overall reliability of the province and the Western Interconnection.”

BC Hydro also states on page 3-7: “It is proposed that entities that plan to join CAISO’s RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC.”

In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.2 Does BC Hydro recommend that the BCUC adopt the NERC RC Standards of Conduct as attached to the Application?

**RESPONSE:**

**No. BC Hydro intends to adopt a form of RC Standards of Conduct similar to the NERC RC Standards of Conduct, revised primarily to remove reporting obligations to NERC. BC Hydro will also consider the Hydro Quebec TransEnergie Reliability Coordinator Code of Conduct<sup>1</sup> in the course of its review. Both the NERC RC Standards of Conduct and the Hydro Quebec TransEnergie Reliability Coordinator Code of Conduct are similar with respect to the rules governing employee conduct, for the purpose of treating all users of the interconnected transmission system in a fair, non-preferential/non-discriminatory manner.**

<sup>1</sup> [http://www.hydroquebec.com/data/transenergie/pdf/code\\_conduite-en.pdf](http://www.hydroquebec.com/data/transenergie/pdf/code_conduite-en.pdf).

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**BC Hydro will file with the BCUC its RC Standards of Conduct showing changes made to the NERC RC Standards of Conduct for information purposes.**

**In developing the RC Standards of Conduct BC Hydro has also reviewed RC Standards of Conduct that have been adopted by RCs in other provinces. Saskatchewan, Ontario, Quebec, and New Brunswick<sup>2</sup> all have Canadian RCs that are listed on the NERC website as signatories to the NERC RC Standards of Conduct.<sup>3</sup>**

**The remaining RCs in other provinces do not appear to have a specific RC Standards of Conduct that would be considered applicable for adoption in the context of B.C.**

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<sup>2</sup> **New Brunswick Power provides RC services to PEI and Nova Scotia.**

<sup>3</sup> <https://www.nerc.com/comm/OC/Pages/ORS/Reliability-Coordinator-Standards-of-Conduct-Signatories.aspx>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
Governance risk evaluation**

On page 3-6 of the Application, BC Hydro states:

In taking on the function of the RC, BC Hydro will continue to make reliability and operational decisions independent of market influences and BC Hydro organizational structure. In addition, BC Hydro proposes that as part of the process of it being designated and approved by the BCUC as an RC functional entity in B.C. that BC Hydro will adhere to a RC Standards of Conduct in a form adopted by the BCUC. A copy of the NERC [North American Electric Reliability Corporation] RC Standards of Conduct are included as Appendix C.

BC Hydro states on page 3-7 of its Application: “BC Hydro as the RC for B.C. will address any issues and concerns raised by B.C. registered entities in a fair and non-discriminatory way, to ensure a positive outcome for the overall reliability of the province and the Western Interconnection.”

BC Hydro also states on page 3-7: “It is proposed that entities that plan to join CAISO’s RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC.”

In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.2 Does BC Hydro recommend that the BCUC adopt the NERC RC Standards of Conduct as attached to the Application?

1.5.2.1 If not, please explain why not and please provide a detailed description with justification of any amendments and deviations from the NERC RC Standards of Conduct for applicability in BC.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.5.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.2.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

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Governance risk evaluation**

On page 3-6 of the Application, BC Hydro states:

In taking on the function of the RC, BC Hydro will continue to make reliability and operational decisions independent of market influences and BC Hydro organizational structure. In addition, BC Hydro proposes that as part of the process of it being designated and approved by the BCUC as an RC functional entity in B.C. that BC Hydro will adhere to a RC Standards of Conduct in a form adopted by the BCUC. A copy of the NERC [North American Electric Reliability Corporation] RC Standards of Conduct are included as Appendix C.

BC Hydro states on page 3-7 of its Application: “BC Hydro as the RC for B.C. will address any issues and concerns raised by B.C. registered entities in a fair and non-discriminatory way, to ensure a positive outcome for the overall reliability of the province and the Western Interconnection.”

BC Hydro also states on page 3-7: “It is proposed that entities that plan to join CAISO’s RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC.”

In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

- 1.5.2 Does BC Hydro recommend that the BCUC adopt the NERC RC Standards of Conduct as attached to the Application?
- 1.5.2.2 If applicable, please provide other Standards of Conduct that have been adopted in other provinces.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.5.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

**RESPONSE:**

**The current scope and responsibilities contemplated by BC Hydro is provided below:**

**1. RC Registered Entities Oversight Group**

**a. Scope**

- RC services
- RC performance metrics

<b>British Columbia Utilities Commission</b> Information Request No. 1.5.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

- RC procedures with impact on the B.C. registered entities.
- General updates on the state of reliability within WECC

**b. Responsibilities**

- Provide recommendations to BC Hydro on the provision of RC services
- Provide recommendations to BC Hydro on changes to RC procedures
- Raise questions to BC Hydro relating to the scope so that they can be addressed to the whole of the oversight group

**2. RC and BA/TOP Operations Working Group**

**a. Scope**

- Next-day operations for all registered BAs and TOPs within B.C.
- Real-time operations for all registered BAs and TOPs within B.C.
- Review of operating procedures specific to the RC, BA and TOPs
- Joint initiatives between RC and BA/TOP functions (e.g. training)

**b. Responsibilities**

- Provide input to the RC on improving next-day and real-time operations processes
- Provide input to the RC on procedures and joint initiatives involving the RC, BA and TOPs

**BC Hydro anticipates formalizing the forgoing in terms of reference that will be finalized closer to the date when the groups are constituted.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
Governance risk evaluation**

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BC Hydro states on page 3-7 of its Application: “BC Hydro as the RC for B.C. will address any issues and concerns raised by B.C. registered entities in a fair and non-discriminatory way, to ensure a positive outcome for the overall reliability of the province and the Western Interconnection.”

BC Hydro also states on page 3-7: “It is proposed that entities that plan to join CAISO’s RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC.”

In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.1 Please explain the systems and processes, including any voting rights of the members of the oversight group that would be established to ensure that any issues and concerns raised by BC registered entities are addressed in a fair and non-discriminatory way.

**RESPONSE:**

**Issues and concerns raised by members of the respective groups will be addressed in a fair and non-discriminatory way. This principle will be reflected in the terms of reference. Please refer to BC Hydro response to BCUC IR 1.5.3.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
Governance risk evaluation**

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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.2 Please explain the alternative specific models that were assessed in the establishment of the oversight group. If possible, please provide examples from other provinces that were assessed in deciding the model for BC.

**RESPONSE:**

**BC Hydro did search for publicly available governance models that exist for other RCs in North America and may be applicable to the context of B.C. This research did not provide any specific alternative models that were considered directly applicable to B.C. CAISO’s proposed Oversight Committee structure was reviewed in some detail and will be used as a model for BC Hydro’s terms of reference.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
Governance risk evaluation**

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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.3 Please explain any feedback received from registered entities on the specific models that would be adopted.

**RESPONSE:**

**In addition to providing the detail of the proposed groups in slide 23 and 24 of the BC Hydro Workshop Presentation (Exhibit B-3), BC Hydro has discussed the proposed groups with FortisBC in phone calls that took place between November 30, 2018 and December 13, 2018. FortisBC expressed an interest in ensuring transparency, independence, and having a clear dispute resolution mechanism. No other feedback on the models has been received to date.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.4</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
Exhibit B-1, Section 3.3.2, pp. 3-6–3-7; Exhibit B-3, pp. 23–24  
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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.4 Please explain if WECC would be a member of the oversight group or an observer, and if not, please explain why not.

**RESPONSE:**

**BC Hydro would object to WECC participation in the RC Registered Entities Oversight Group on the basis that WECC, as the BCUC administrator, performs the compliance and enforcement role for the BCUC. Generally participation in the oversight and working groups should be conditional on receipt of RC services. Nevertheless, BC Hydro anticipates ongoing dialog with WECC in regard to the RC function.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.5</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.5 If it was determined that the adopted model was not effective, please explain how BC Hydro would transition to a new more effective model.

**RESPONSE:**

**There is no basis for assuming that the oversight and working groups would not be effective in achieving their stated objectives as their respective terms of reference will take into consideration feedback from registered entities.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.5.3.6</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 C. GOVERNANCE**

**Reference: Reliability Coordinator Function Alternatives  
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In Exhibit B-3, BC Hydro proposed two groups that would be established for RC governance: RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group.

1.5.3 Please provide in detail the scope and responsibilities of the oversight group and the working group proposed by BC Hydro.

1.5.3.6 Would BC Hydro be open to establishing the oversight and working groups on a pilot basis, subject to the BCUC reviewing the effectiveness of these groups at a future date?

**RESPONSE:**

**BC Hydro does not see the need to establish the oversight and working groups on a pilot basis. Prior to establishing the oversight and working groups BC Hydro will receive feedback from B.C. registered entities on what criteria would sufficiently demonstrate the effectiveness of the proposed groups.**

**Please also refer to BC Hydro’s response to BCUC IRs 1.5.3 and 1.5.3.5.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.6.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**6.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Agreements  
 Exhibit B-1, Section 4.2.2, p. 4-3  
 Agreements**

In its Application, BC Hydro states:

Each RC is required to coordinate with other RC's in the interconnection. Agreements are an effective means to clarify issues and expectations and ensure coordination and compliance with the Reliability Standards. BC Hydro expects to have agreement in place with PEAK [PEAK Reliability], CAISO, SPP [Southwest Power Pool] and AESO [Alberta Electric System Operator] prior to beginning RC operations.

- 1.6.1 Please discuss the current status of agreements with current and future RCs and describe the potential risks which BC Hydro might face as result of not finalizing these agreements prior to beginning RC operations.

**RESPONSE:**

**BC Hydro has received draft forms of Reliability Coordination Agreements from each of AESO, PEAK and CAISO. BC Hydro is in the process of reviewing these agreements and has not yet provided its comments on the form of agreements to the counterparties. BC Hydro has not received or prepared a draft form of Reliability Coordination Agreement with SPP at this time.**

**These agreements provide a definition of roles and responsibilities and a framework for much of the coordination that already exists between BC Hydro and AESO, PEAK and CAISO. Coordination of data exchange, services, congestion management and outage scheduling, emergency conditions and voltage schedules would continue unimpeded by delays in finalizing agreements. BC Hydro is not seeking to procure any services from any of AESO, PEAK, or CAISO during the transitional period in 2019 or afterwards. Tools that will be shared amongst RCs will be placed in service and tested during shadow operations and can continue to be used even if there are delays in finalizing agreements.**

**BC Hydro, PEAK, AESO, and CAISO will follow the requirements of the Reliability Standards applicable to RCs to ensure that reliability of the BES is maintained even if agreements have not yet been finalized.**

**In summary, BC Hydro sees no risk as a result of not finalizing agreements with other RCs prior to beginning RC operations.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.6.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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1.6.1 Please discuss the current status of agreements with current and future RCs and describe the potential risks which BC Hydro might face as result of not finalizing these agreements prior to beginning RC operations.

1.6.1.1 In the event that these agreements cannot be finalized for reasons outside of your control, what steps would BC Hydro take to minimise impact on BC Hydro's RC operations?

**RESPONSE:**

**There is common interest to both parties to have agreements in place. If agreements cannot be finalized for reasons beyond the control of BC Hydro, the following steps would be taken to minimise impact on the BC Hydro RC operations:**

- 1. Establish interim agreements to support coordinated operations until final agreements are in place;**
- 2. If step 1 is unsuccessful, provide a letter to the party(s) indicating BC Hydro's intended actions to support coordinated operations until final agreements are in place; and**
- 3. Ensure regular dialog with the party(s) continues to support coordinated operations and reliable operation of the interconnection.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.1 Please highlight the differences between an Assurance review and Full certification by WECC.

**RESPONSE:**

**Full certification is a process defined in section 500 of the NERC Rules of Procedure<sup>2</sup> as an Organization Certification Program and described in section 4.2.3 of the Application. NERC has delegated the certification process for entities in the Western Interconnection to WECC. BC Hydro is not subject to the NERC Rules of Procedure and instead follows the B.C. MRS Rules of Procedure, which are silent on the circumstances in which a full certification may be required, or the process to be followed to achieve certification.**

**The purpose of the NERC Organization Certification Program is to ensure that the new entity (i.e., an applicant to be an RC, BA, or TOP that is not already performing the function for which it is applying to be certified as) has the tools, processes, training, and procedures to demonstrate their ability to meet the requirements/sub-requirements of all of the Reliability Standards applicable to the function(s) for which it is applying thereby demonstrating the ability to become certified and then operational.**

**For U.S. entities such as CAISO and SPP who register with NERC and are subject to NERC's Rules of Procedure, WECC follows the NERC Rules of Procedure and those entities will be undergoing a full certification as they take on the RC function.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<sup>2</sup> [https://www.nerc.com/FilingsOrders/us/RuleOfProcedureDL/NERC\\_ROP\\_Effective\\_20180719.pdf](https://www.nerc.com/FilingsOrders/us/RuleOfProcedureDL/NERC_ROP_Effective_20180719.pdf).



<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**A full certification in the U.S. for the RC function uses the processes and templates prescribed by NERC and examines the applicant’s ability to be compliant with all the Reliability Standards associated with an RC.**

**There is no requirement for a B.C. entity requesting registration as an RC, BA or TOP to follow a prescribed certification process. BC Hydro believes that some form of assessment is preferable to assure the BCUC that BC Hydro has the tools, processes, training, and procedures to meet the requirements of the Reliability Standards associated with RC function.**

**As described in BC Hydro’s response to BCUC IR 1.7.1.1, the bulk of the differences in standards expected to be covered in a full certification as opposed to an assurance review are in the area of the Critical Infrastructure Protection (CIP) Reliability Standards. BC Hydro believes it is not necessary to have WECC review these Reliability Standards when assessing BC Hydro’s RC capabilities. The proposed BC Hydro RC function will be working within the same electronic security perimeter and protected by the same cyber security systems that protect the BA and TOP operating functions. Having the RC team submit to a review of compliance with the CIP Reliability Standards that protect these physical and cyber assets is duplicative. Any additional cyber assets added to the control room because of the RC function will automatically be covered by existing processes applicable to the CIP Reliability Standards as the requirements apply already to the BA and TOP functions. If BC Hydro were establishing a new control center or had no previous role as BA and TOP, a fulsome review of compliance with those Reliability Standards would be necessary.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 4
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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1.7.1 Please highlight the differences between an Assurance review and Full certification by WECC.

1.7.1.1 Please provide this information in a summary table, and include each standard that would be assessed through Full certification compared to an Assurance review. Please note any standards that have not previously been reviewed by WECC in relation to any other functional registration by BC Hydro, such as Critical Infrastructure Protection (CIP) standards.

**RESPONSE:**

**BC Hydro submits that an assurance review, as opposed to a full certification, would not require the evaluation of the CIP Reliability Standards as these apply equally to BA/TOP/RC functions and have been frequently and recently evaluated for compliance. BC Hydro’s transition to CIP Version 5 from CIP Version 3 was recently evaluated in an October 2017 WECC on-site audit. The 2017 on-site Audit team consisted of WECC staff and consultants. In addition, two BCUC staff observers and two observers from the office of the BC Auditor General were included.**

**The CIP Version 5 Reliability Standards became effective October 1, 2018, for which BC Hydro conducted an internal self-assessment of compliance of all CIP Version 5 Reliability Standards using the services of external MRS compliance audit consultants. BC Hydro will be subject to another CIP Version 5 self-assessment in 2019, followed by its next WECC on-site audit in 2020.**

**The CIP Reliability Standards protect the security of electronic perimeters, as well as vital cyber-assets. These Reliability Standards also encompass matters that include security management, personnel and training, and disaster recovery planning. The RC function will be executed from the same control rooms as the**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 4
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**BA and TOP functions which are compliant with the requirements of the CIP Reliability Standards in effect in B.C. today.**

**The specific distinctions between the requirements of a full certification and assurance review are described in BC Hydro's response to BCUC IR 1.7.1. As noted, the scope and details of a full certification or assurance review are ultimately up to the BCUC to determine in consultation with WECC.**

**The following table has been drafted to summarize the CIP Reliability Standards that apply to the RC function and would be excluded from an assurance review. This includes current and future effective Reliability Standards as well as those held in abeyance or subject to MRS Assessment Report No. 12. Through the CIP Version 5 transition project BC Hydro is now following all the applicable requirements of the CIP Reliability Standards that came into effect on October 1, 2018 for its BA and TOP functions.**

**All other Reliability Standards that apply to the RC function could be part of a full certification can be found in Appendix B of the Application.**

B.C. Effective Date	Standard Number	Requirement Number	Previously been reviewed by WECC in relation to any other functional registration by BC Hydro?	Included in Full Certification?	Included in Assurance Review?	Note
01-Oct-18	CIP-002-5.1a	R1.-R2.	Yes	Yes	No	2017 WECC audit covered CIP-002-5.1 with identical requirements
01-Oct-18	CIP-003-5	R1.	Yes	Yes	No	Covered in 2017 WECC audit
01-Oct-18	CIP-003-5	R2.-R4.	No	Yes	No	R2.2, R2.3: Adoption held in abeyance pending the adoption of CIP-003-7
Held in Abeyance	CIP-003-6	R1.-R4.	No	No	No	Not effective in B.C.
Assessment Report 12	CIP-003-7	R1.-R4.	No	No	No	Not effective in B.C.
01-Oct-18	CIP-004-6	R1.-R3.	No	Yes	No	2018 Self-Assessment during CIP v5 transition project
01-Oct-18	CIP-004-6	R4.-R5.	Yes	Yes	No	2017 WECC audit covered CIP-004-5 R4-R5 with identical requirements

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 3 of 4
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

B.C. Effective Date	Standard Number	Requirement Number	Previously been reviewed by WECC in relation to any other functional registration by BC Hydro?	Included in Full Certification?	Included in Assurance Review?	Note
01-Oct-18	CIP-005-5	R1.-R2.	Yes	Yes	No	Covered in 2017 WECC audit
01-Oct-18	CIP-006-6	R1.-R2.	Yes	Yes	No	2017 WECC audit covered CIP-006-5 R1-R2 with identical requirements to CIP-006-6 with the exception of CIP-006-6 Requirement Part 1.10 which is incrementally new and covered under the 2018 Self-Assessment
01-Oct-18	CIP-006-6	R3	No	Yes	No	2018 Self-Assessment during CIP v5 transition project
01-Oct-18	CIP-007-6	R1.-R5.	Yes	Yes	No	2017 WECC audit covered CIP-007-5 R1-R5 with identical requirements with the exception of CIP-007-6 Requirement Part 1.2 which is incrementally new and for which the initial compliance is not required until October 1, 2019
01-Oct-18	CIP-008-5	R1.-R3.	Yes	Yes	No	Covered in 2017 WECC audit
01-Oct-18	CIP-009-6	R1.-R2.	Yes	Yes	No	2017 WECC audit covered CIP-009-5 R1-R2 with identical requirements
01-Oct-18	CIP-009-6	R3.	No	Yes	No	Not possible to assess until event or role change has happened
01-Oct-18	CIP-010-2	R1.-R3.	Yes	Yes	No	2017 WECC audit covered CIP-010-1 R1-R3 with identical requirements
01-Oct-18	CIP-010-2	R4.	No	Yes	No	Initial compliance with CIP-010-2 R4 is not expected until October 1, 2019 per BCUC Implementation Plan

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 4 of 4
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

B.C. Effective Date	Standard Number	Requirement Number	Previously been reviewed by WECC in relation to any other functional registration by BC Hydro?	Included in Full Certification?	Included in Assurance Review?	Note
01-Oct-18	CIP-011-2	R1.-R2.	Yes	Yes	No	2017 WECC audit covered CIP-011-1 R1-R2 with identical requirements

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.1.2 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

- 1.7.1 Please highlight the differences between an Assurance review and Full certification by WECC.
- 1.7.1.2 Please include identification of RC functions that would not be assessed by WECC, and any difference in the level of review of the functions that would be assessed.

**RESPONSE:**

**As indicated in BC Hydro's response to BCUC IRs 1.7.1 and 1.7.1.1 the CIP Reliability Standards would not be included in an assurance review, therefore the only RC functions that would not be assessed by WECC are those supported by the CIP Reliability Standards.**

**Further, BC Hydro expects that there is no difference in the level of review of the functions between a full certification and an assurance review. The only difference is in the Reliability Standards included.**

**For those RC functions that would not be assessed, BC Hydro's expectation is that the type of assessment performed would be substantially similar for all applicable functions (BA, TOP, and RC).**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.7.1.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.1 Please highlight the differences between an Assurance review and Full certification by WECC.

1.7.1.3 For those RC functions that would not be assessed, please explain the following: (i) when were they last reviewed by WECC; and (ii) would the type of assessment be different for a RC compared to a Balancing Authority (BA)?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IRs 1.7.1, 1.7.1.1 and 1.7.1.2.**

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<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.7.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.2 For standards that would not reviewed by WECC under the proposed Assurance review, please indicate any advantages to forego such review.

**RESPONSE:**

**The primary advantage in foregoing review for certain Reliability Standards under a proposed assurance review would be the savings of resources by BC Hydro to demonstrate compliance to these Reliability Standards and in the WECC team in reviewing the materials provided by BC Hydro. This advantage is only applicable to those Reliability Standards that apply to entities performing the RC function for which BC Hydro plans to make no changes to existing processes and tools because the compliance requirement is the same as it is for BC Hydro in its existing function types (e.g., BA and TOP).**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.



<b>British Columbia Utilities Commission</b> Information Request No. 1.7.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.3 Please explain the risks, compared to Full certification, of BC Hydro undertaking the following lower levels of assessment:

- (i) a WECC Assurance review; and
- (ii) a self-assessment conducted by BC Hydro. Please include in your explanation whether a lower level of certification could negatively affect the perception of BC Hydro's competence to perform the RC function with other RC providers, and/or increase the level of scrutiny should there be a blackout.

**RESPONSE:**

**BC Hydro sees no material difference between a full certification and an assurance review from a risk perspective. Both processes would be conducted by WECC using their staff and industry experts. Both processes require onsite visits to BC Hydro's control center. The only difference between the processes is the breadth of the Reliability Standards that are covered. Under the full Certification, every requirement of every Reliability Standard that pertains to an RC would be examined, even if it also pertains to existing roles that BC Hydro is already compliant with such as BA or TOP.**

**Under the assurance review the focus would be on those requirements of the MRS that pertain to the RC but for which BC Hydro has never been audited. This is a narrower scope as identified in the response to BCUC IR 1.7.1.**

**Given that BC Hydro has a long history of successful triennial audits, annual self certifications, and transparent self reporting, there is a high degree of confidence in our compliance with the requirements of the Reliability Standards that are**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.7.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**common to both RC and other roles for which BC Hydro is already registered and has recently been audited.**

**BC Hydro is not proposing a self-assessment because an assurance review provides more rigour and confidence.**

British Columbia Utilities Commission Information Request No. 1.7.4 Dated: December 21, 2018 British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.4 Please explain BC Hydro's statement that full WECC certification would risk impacting BC Hydro's RC implementation timeline. Please include in the explanation: (i) how BC Hydro determined that the timeline could be negatively impacted; (ii) what is BC Hydro's estimate of the likelihood of a negative impact to the timeline; and (iii) what could be the end result should it occur. Please also identify ways in which BC Hydro could mitigate both the likelihood and impact of this risk.

**RESPONSE:**

**In Table 4-2 of the Application, the disadvantages of both the assurance review and full certification were identified as 'risk of impact to BC Hydro's RC implementation timeline'. The timeline risk associated with either option arises from the uncertainty associated with the registration process, which is not expressly set out in the B.C. MRS Rules of Procedure.**

**In anticipation that the registration process would need to be confirmed between the BCUC and WECC, BC Hydro included in its anticipated timeline, at Figure 4-2 of the Application, an allowance for terms of reference to be developed between the two entities to confirm the RC registration process. To be clear, the registration process includes both the determination of whether WECC will perform either a full certification or an assurance review, as well as the resolution of any other related issues between the BCUC and WECC. Whether terms of reference are in fact required is unknown to BC Hydro, and is an issue to be resolved between the BCUC and WECC.**

**A delay in confirming the registration process could result in a delay to the performance by WECC of its assessment (full certification or assurance review); a delay in WECC issuing the results to the BCUC; and a delay in the BCUC's consideration of the report.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.4 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

To mitigate the likelihood and impact of timeline risk, BC Hydro has confirmed the availability of WECC during the May 2019 timeframe to conduct either a full certification or assurance review and has begun to ensure that the necessary people, training, processes, and technology to support WECC's review are available. For its part, WECC has indicated its availability to perform an assessment (either a full certification or assurance review) of BC Hydro's RC capabilities in May 2019.

At this point in time, BC Hydro has no further ability to unilaterally mitigate timeline risk. The critical path task to a timely certification or assurance review is now a BCUC decision with respect to the nature of the review it requires as a condition of registering BC Hydro as the RC for B.C., and confirmation with the WECC as to any other issues between them (perhaps through terms of reference, but not necessarily). BC Hydro believes that these decisions (and any associated tasks) need to be completed not much later than the middle of February to preserve the May window for the WECC review.

In turn, an assessment by WECC in May is on the critical path for BC Hydro to be registered as the RC for B.C. by September. A May assessment allows time for WECC to issue its report and for the BCUC to consider it before confirming (or not) the proposed registration before September 2, 2019.

September 2, 2019 is a significant date because it coincides with the end of PEAK's contractual obligations to provide RC services for B.C. In the absence of any further BCUC order it will continue to be recognized as the RC for B.C. pursuant to BCUC Letter No. L-65-14, but will no longer have any obligation to perform the necessary functions. While BC Hydro does not believe that the temporary absence of an RC poses a critical reliability risk, and nor would a temporary absence of an RC put B.C. entities out of compliance with any Reliability Standards, it is clear that the RC function is critical to the MRS scheme and that any material delay in registering an RC for B.C. is undesirable.

BC Hydro notes that PEAK will be dissolving effective January 1, 2020, and is planning to wind-down operations over the course of 2019 (e.g., staff reductions, giving up office space, etc.). In these circumstances a temporary extension of BC Hydro's arrangements with PEAK is not practicable.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.4.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

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CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.4 Please explain BC Hydro's statement that full WECC certification would risk impacting BC Hydro's RC implementation timeline. Please include in the explanation: (i) how BC Hydro determined that the timeline could be negatively impacted; (ii) what is BC Hydro's estimate of the likelihood of a negative impact to the timeline; and (iii) what could be the end result should it occur. Please also identify ways in which BC Hydro could mitigate both the likelihood and impact of this risk.

1.7.4.1 Please explain what level of certification entities currently served by PEAK are obtaining and if they are obtaining full WECC certification, how they have addressed the timeline risk.

**RESPONSE:**

**In the U.S. entities are subjected to NERC Rules of Procedure which specify full certification for RC registration. Both CAISO and SPP will be subjected to a full certification led by WECC prior to their provision of RC services to those entities currently served by PEAK. The full certification process is set out in the NERC Rules of Procedure and they have addressed timeline risk by confirming dates with WECC well in advance.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.5 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.5 Please explain: (i) whether WECC or BC Hydro would define the nature of the Assurance review; and (ii) whether the Assurance review proposed by BC Hydro would be the same as that undertaken by the Alberta Electric System Operator (AESO) when it took over the RC role.

**RESPONSE:**

The nature or scope of the assurance review would be defined primarily by WECC as BCUC's administrator with input from BC Hydro when requested and ultimately approved by the BCUC.

It is unlikely that a BC Hydro assurance review performed by WECC would be the same as that undertaken by AESO after it took over the RC role on January 1, 2014, but the purpose would be similar. Based on information from the AESO, the purpose of the AESO assurance review (referred to as an operational assessment) was to evaluate whether AESO had the processes, procedures, tools, training and personnel in place to reliably perform the RC function in Alberta. The AESO's assessment included a site visit in November 2015 and was completed in December 2015 (subsequent to AESO being appointed as RC).

The AESO assessment followed the methodology and protocols of the NERC certification process but with the Alberta version of the Reliability Standards as the reference. As per the NERC certification process, the NERC-led assessment team had WECC and NERC staff as well as representatives from PEAK, SaskPower and Northwestern Energy on the assessment team. A formal report of the assessment was issued to AESO by NERC.

The AESO is not a registered entity under the NERC functional model registry. As such, AESO did not ask to be recognized as an RC by NERC. AESO's accountability for reliability for the province is embedded in Alberta legislation.

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.5.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.5 Please explain: (i) whether WECC or BC Hydro would define the nature of the Assurance review; and (ii) whether the Assurance review proposed by BC Hydro would be the same as that undertaken by the Alberta Electric System Operator (AESO) when it took over the RC role.

1.7.5.1 Please identify the date that the AESO took over the RC role, and discuss whether there have been any changes since that date in the overall complexity of the market and/or RC functions that could support a higher level of review today.

**RESPONSE:**

**AESO took over the RC role on January 1, 2014. Their operational assessment took place in 2015 with a site visit in November, and was completed by the end of December 2015.**

**BC Hydro's understanding from communication with AESO is that there has not been significant change to either the Alberta market or RC functions since the time of the operational assessment that would have supported a higher level of review today.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.5.2 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.5 Please explain: (i) whether WECC or BC Hydro would define the nature of the Assurance review; and (ii) whether the Assurance review proposed by BC Hydro would be the same as that undertaken by the Alberta Electric System Operator (AESO) when it took over the RC role.

1.7.5.2 Please identify any changes to NERC standards that have been adopted by other RCs since AESO took over the RC role and explain whether these NERC standards will be subject to review by WECC through the Assurance review and Full certification.

**RESPONSE:**

**There have been 16 RCs in North America since 2015 and it is not feasible to track which changes to Reliability Standards have been adopted by each. BC Hydro would expect that for either an assurance review or a full certification, the latest version of the Reliability Standards in effect in B.C. would be used to guide the process.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.7.5.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.5 Please explain: (i) whether WECC or BC Hydro would define the nature of the Assurance review; and (ii) whether the Assurance review proposed by BC Hydro would be the same as that undertaken by the Alberta Electric System Operator (AESO) when it took over the RC role.

1.7.5.3 What additional assessments, if any, did AESO undertake after their initial Assurance review? Please indicate whether these reviews were performed out by WECC or other internal bodies.

**RESPONSE:**

**Like BC Hydro, the AESO is subject to a three-year audit cycle with its most recent compliance audits performed by WECC in 2014 and 2017 which includes RC specific Reliability Standards. The AESO is also subject to self-certification on an annual basis. No other RC specific assessments of the AESO's RC function have happened since the initial operational assessment.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.7.6 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
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 CAISO Reliability Coordinator Frequently Asked Questions  
 (RC FAQs)<sup>1</sup>, p. 2  
 Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.6 Please comment on the following option: the BCUC registering BC Hydro as the RC on the basis of an Assurance review now, but with a requirement that BC Hydro obtain full WECC certification within a specific timeline. Please include a discussion of the advantages/disadvantages of such an option, and what timeline could be feasible to obtain full WECC certification.

**RESPONSE:**

**The option described in the IR would seem to be duplicative as a full certification process carried out at a later date would repeat the activities carried out in the assurance review as well as repeat activities carried out in earlier audits and in an upcoming triennial on-site audit of BC Hydro by WECC in 2020. The option does provide the opportunity for BC Hydro to become the RC for B.C. on or prior to BC Hydro's withdrawal from PEAK on September 2, 2019 but does not serve that objective any better than the other two options (full certification or assurance review in May 2019).**

**A variant on this option would be for an assurance review in May 2019, the registration of BC Hydro as RC before September 2, 2019, followed by the BCUC working with WECC to ensure that the material covered in the 2020 compliance audit of BC Hydro would include the CIP Reliability Standards that were not covered in the May 2019 assurance review.**

**Please refer to BC Hydro's response to BCUC IR 1.7.1.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

British Columbia Utilities Commission Information Request No. 1.7.7 Dated: December 21, 2018 British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

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(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.7 If other entities are obtaining full NERC certification, please comment on how BC Hydro's proposed Assurance Review aligns with section 125.2(6) of the *Utilities Commission Act*.

**RESPONSE:**

**UCA section 125.2(6), along with UCA section 125.2(7), are in regard to the legal test to be employed by the BCUC when considering the adoption of Reliability Standards. Those provisions are primarily focused on the establishment of consistent Reliability Standards across North America, and do not speak to the scope of a WECC review conducted as part of a registration process. Indeed nothing in the B.C. MRS legislative framework compels the BCUC to determine a particular scope of review by WECC in that context.**

**Regardless of whether the BCUC requires an assurance review or a full certification by WECC of BC Hydro as part of the registration process, the report that will issue from WECC in consequence of its assessment is evidence that should be given significant weight in the BCUC's consideration of BC Hydro's application for registration as RC for B.C. Please refer to BC Hydro's response to BCUC IR 1.1.1.**

**Also please refer to BC Hydro's response to BCUC IR 1.7.1 for a full explanation of the review that BC Hydro thinks is appropriate in the circumstances as a condition of registering it as RC for B.C.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.7.8</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**7.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.2.3, Table 4-2, p. 4-5;  
CAISO Reliability Coordinator Frequently Asked Questions  
(RC FAQs)<sup>1</sup>, p. 2  
Level of certification**

BC Hydro describes its certification options in Table 4-2 of the Application and states that Full certification provides the highest level of assessment but risks impacting BC Hydro's RC timeline. CAISO states in its RC FAQs that the RC needs to be NERC-certified to ensure it has adequate facilities, tools, personnel, procedures and training necessary to perform the tasks of the RC.

1.7.8 Other than WECC's resource constraints and its possible effect on BC Hydro's RC implementation timeline, can BC Hydro explain if there are any other reasons why a Full certification is not warranted prior to approval of BC Hydro's application to become the registered RC for BC?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.7.6.**

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<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.8.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**8.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
 Exhibit B-1, Section 4.3.1, p. 4-8; Section 4.4, p. 4-12  
 Cost and cost recovery**

On page 4-8 of the Application, BC Hydro provides an estimate of RC start-up and ongoing costs, and further states on page 4-12 that it is not planning on recovering costs from registered entities but may do so in the future.

1.8.1 Please explain to what extent, if any, the medium level of implementation risk identified by BC Hydro is related to the estimated RC budget estimate. To the extent that there is a relationship, please quantify the cost/risk trade-off.

**RESPONSE:**

**At the time of filing the Application there were some uncertainties with respect to the technology components, which contributed to the medium level of implementation risk.**

**The requirements to develop the technology are related to the line items in the budget estimate for ‘Consulting Fees’ and ‘Software Purchases, Licensing, and Shared Services’ (refer to Table 4-3 of the Application). The anticipated start-up technology costs were accounted for in the start-up costs for these two items and in the contingency amount applied.**

**Since filing the Application, BC Hydro has been working internally and with the other RCs of the Western Interconnection to confirm the technology requirements and agree on scope, schedule and costs for these items.**

**BC Hydro has reached certainty in the costs for the Wide-Area Visualization tool which was reflected as a portion of ‘Software Purchases, Licensing, and Shared Services’ and has procured the necessary software and licensing.**

**In addition, there is now more certainty in the development of scope for the ‘Shared Services’ portion and the technology costs captured within ‘Consulting Fees’.**

**A portion of the medium level of implementation risk for technology components will remain until the scope and costs for technology items are finalized, which is expected in coming months.**

**As the technology work required becomes clarified, risk will be lessened and costs will become more certain. BC Hydro is reviewing options that can be implemented in the required time frame to provide a balance of cost efficiencies while supporting the necessary RC capabilities.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.8.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**8.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.3.1, p. 4-8; Section 4.4, p. 4-12  
Cost and cost recovery**

On page 4-8 of the Application, BC Hydro provides an estimate of RC start-up and ongoing costs, and further states on page 4-12 that it is not planning on recovering costs from registered entities but may do so in the future.

1.8.2 Please confirm that BC Hydro recognizes that the costs described in this Application are subject to be reviewed during a future revenue requirements application.

**RESPONSE:**

**Confirmed.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.8.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**8.0 D. RELIABILITY COORDINATOR FUNCTION SOLUTION**

**Reference: Certification Process  
Exhibit B-1, Section 4.3.1, p. 4-8; Section 4.4, p. 4-12  
Cost and cost recovery**

On page 4-8 of the Application, BC Hydro provides an estimate of RC start-up and ongoing costs, and further states on page 4-12 that it is not planning on recovering costs from registered entities but may do so in the future.

1.8.3 Please explain under which circumstances BC Hydro may consider it appropriate to recover RC costs from registered entities and the basis for such recovery.

**RESPONSE:**

**As stated on page 4-12 of the Application, BC Hydro is not seeking cost recovery from B.C. registered entities as part of this process. In the future it may be appropriate to review cost sharing for a part of or the whole MRS Program amongst B.C. registered entities.**

**BC Hydro submits that there may be various cost recovery mechanisms that could be employed. One possible mechanism for cost recovery could be on a net energy for load basis, similar to how WECC fees are currently recovered from member organizations.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.1 Please provide a detailed description of the stakeholder engagement that BC Hydro has undertaken with registered entities since the filing of the Application.

**RESPONSE:**

**Provided below is a list of stakeholder engagement activities that BC Hydro has undertaken since filing the Application on October 29, 2018.**

- 1. November 5, 2018: BC Hydro provided agenda via email to FortisBC (Compliance and Operations) for November 6, 2018 conference call.**
- 2. November 6, 2018: BC Hydro and FortisBC held conference call to review agenda items shared on November 5, 2018 and discuss current and planned RC activities.**
- 3. November 7, 2018: Email provided to an entity that requested more information on RC roles and responsibilities. Also refer to BC Hydro's response to BCUC IR 1.9.3.**
- 4. November 7, 2018: Email provided to an entity that requested data obligations for the registered entities of B.C. Also refer to BC Hydro's response to BCUC IR 1.9.3.**



<b>British Columbia Utilities Commission</b> Information Request No. 1.9.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

5. **November 9, 2018: FortisBC sent email to BC Hydro providing additional questions and items for discussion.**
6. **November 15, 2018: BC Hydro sent email to FortisBC requesting to set up another meeting for November 21 to 23, 2018.**
7. **November 20, 2018: BC Hydro and FortisBC exchange email and agree to meet the mornings of November 23, 2018 and November 30, 2018.**
8. **November 23, 2018: BC Hydro and FortisBC held conference call to discuss updates since November 6, 2018 meeting.**
9. **November 26, 2018: BC Hydro sent email to FortisBC with answers to questions raised in November 9, 2018 email and provided three draft documents for review by FortisBC.**
10. **November 26, 2018: BC Hydro forwarded email to FortisBC requesting their review and feedback on the proposed Western Interconnection Data Sharing Agreement that had been drafted by the CAISO.**
11. **November 29, 2018: BC Hydro sent email to FortisBC including a document titled 'FortisBC RC issues list' that captured the content of previous conference calls, issues raised and action items identified and/or completed.**
12. **November 30, 2018: BC Hydro and FortisBC held conference call to review and provide an update on the FortisBC RC issues list as provided by BC Hydro. BC Hydro and FortisBC agreed to meet again on December 13, 2018.**
13. **November 30, 2018: BC Hydro forwarded email to FortisBC indicating that the feedback timeline for the Western Interconnection Data Sharing Agreement had been extended until December 7, 2018. A further email was sent on the same day to provide BC Hydro's Legal contacts to FortisBC.**
14. **December 5, 2018: FortisBC sent email to BC Hydro with their proposed comments on the proposed Western Interconnection Data Sharing Agreement. FortisBC also requested to review BC Hydro's comments.**
15. **December 6, 2018: BC Hydro sent email to FortisBC representing BC Hydro's proposed comments to the proposed Western Interconnection Data Sharing Agreement.**
16. **December 10, 2018: FortisBC sent email to BC Hydro providing comments on three drafted documents that were shared on November 26, 2018. FortisBC also included documents from Hydro-Quebec for RC Code of Conduct and Consultation Process.**
17. **December 12, 2018: BC Hydro sent email to FortisBC including a written description of the proposed RC organizational structure and reporting**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 3 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

relationship within the BC Hydro organization. In addition, an updated version of the FortisBC RC issues list was provided.

18. **December 13, 2018: BC Hydro and FortisBC held conference call to review the updated FortisBC RC issues list as provided by BC Hydro on December 12, 2018.**
19. **December 17, 2018: FortisBC sent email to BC Hydro providing further comments on one of the draft procedures.**
20. **January 19, 2019: BC Hydro provided notice to the B.C. registered entities that WECC is hosting an RC forum on January 24, 2019. The agenda was provided and details of connecting to the forum via webinar.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.2 Has BC Hydro considered establishing a working group with registered entities to address topics such as operations planning, data sharing, emergency procedures and training?

**RESPONSE:**

**BC Hydro is interested in engaging with B.C. registered entities to seek input on items such as operations planning, data sharing, emergency procedures and training. To that end, BC Hydro is establishing two working groups 'RC Registered Entities Oversight Group' and 'RC and BA/TOP Operations Working Group' as discussed in BC Hydro's response to BCUC IR 1.5.3. To date, the primary interested party is FortisBC and BC Hydro has been actively working with FortisBC on a number of issues they have raised.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.2 Has BC Hydro considered establishing a working group with registered entities to address topics such as operations planning, data sharing, emergency procedures and training?

1.9.2.1 If so, please provide the details and outline any feedback received from registered entities. If not, please explain the rationale for not establishing a working group.

**RESPONSE:**

**In September 2018, FortisBC expressed interest in becoming involved in discussions including the development of RC services and procedures. Periodic discussions between BC Hydro and FortisBC began in October and FortisBC has provided significant feedback since that time as detailed in BC Hydro's response to BCUC IR 1.9.6.**

**BC Hydro has contacted all B.C. registered entities as described in the Application and the registered entities who responded besides FortisBC have expressed interest in continuing engagement through emails, conference calls and webinars. BC Hydro plans to engage the registered entities through these means until the establishment of the RC Registered Entities Oversight Group.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.9.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
 Exhibit B-1, Section 5.3.1, p. 5-2  
 Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.3 Has BC Hydro provided information requested by entities regarding RC roles and responsibilities, data-sharing obligations and information on how independence of the RC function will be maintained as requested?

**RESPONSE:**

**BC Hydro has provided information requested by entities as follows:**

- 1. RC roles and responsibilities – Email provided to an entity on November 7, 2018 which included the statement: “BC Hydro has submitted a filing to the BCUC on October 29<sup>th</sup> to support our registration as the Reliability Coordinator for the province. I hope you have an opportunity to review the filing. I’d be happy to speak directly to any further questions that you may have on the RC role and the impacts for BC.” BC Hydro believes the filing provided to the BCUC provides sufficient level of detail to describe the RC roles and responsibilities.**

**Please refer to BC Hydro's response to BCUC IR 1.9.6 for additional entity feedback.**

- 2. Data-sharing obligations – Email provided to an entity on November 7, 2018 which included the statement “Data obligations: For those entities that are obligated to provide data to PEAK as the RC for B.C., this obligation would**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

then be transferred to BC Hydro. BC Hydro is considering how best to communicate to the entities in regards to this. I expect that BC Hydro already receives most data that would be required. We do plan to confirm this, identify any data gaps, and are working with our Legal team on how to communicate to entities that we would now be using data to support work as the RC.”

Please refer to BC Hydro’s response to BCUC IR 1.9.6 for additional entity feedback.

3. For information on how independence of the RC function will be maintained please refer to BC Hydro’s response to BCUC IR 1.9.6.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.3 Has BC Hydro provided information requested by entities regarding RC roles and responsibilities, data-sharing obligations and information on how independence of the RC function will be maintained as requested?

1.9.3.1 If yes, please provide details and outline any feedback received from registered entities and if no, please provide reasons why not.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.3.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.4</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
 Exhibit B-1, Section 5.3.1, p. 5-2  
 Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.4 Has BC Hydro provided information requested by registered entities about providing more information on CAISO as the RC?

**RESPONSE:**

**Yes. BC Hydro held a phone call on October 24, 2018 with an entity that asked for information regarding CAISO being the RC for B.C. Information was provided about BC Hydro's assessment of the CAISO option and a rationale offered for BC Hydro taking on the RC function for B.C. The information provided included a summary of the content included in Chapter 3 of the Application specific to the CAISO alternative.**

**The entity provided general feedback about ensuring that BC Hydro as RC was cost-effective and provided reliability value. There was also some general discussion about risk of compliance associated with the RC role and mitigation that BC Hydro may consider. BC Hydro did not document any additional specific feedback about the entity's response.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.4.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

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Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

- 1.9.4 Has BC Hydro provided information requested by registered entities about providing more information on CAISO as the RC?
  - 1.9.4.1 If yes, please provide details and outline any feedback received from registered entities and if no, please provide reasons why not.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.4.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.5</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.5 Has BC Hydro provided information requested registered entities on the level of independent evaluation of BC Hydro's RC capability?

**RESPONSE:**

**Yes. BC Hydro provided additional information to a registered entity that raised this issue during a telephone call on October 24, 2018. The information provided included a summary of section 4.2.3 of the Application.**

**The entity provided general feedback in support of an independent evaluation of BC Hydro's RC capability.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.5.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
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Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.5 Has BC Hydro provided information requested registered entities on the level of independent evaluation of BC Hydro's RC capability?

1.9.5.1 If yes, please provide details and outline any feedback received from registered entities and if no, please provide reasons why not.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.5.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.6</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
 Exhibit B-1, Section 5.3.1, p. 5-2  
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Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.6 Please provide the feedback including any suggestions received from FortisBC with regards to BC Hydro's proposal to become the RC for BC.

**RESPONSE:**

**FortisBC initially shared their feedback with BC Hydro via email on September 28, 2018. Telephone meetings involving BC Hydro and FortisBC began on October 24, 2018 and have continued since then. Based on the most recent meeting held on December 13, 2018 the following is a summary of the feedback including suggestions received from FortisBC:**

- 1. Independence of the BC Hydro RC staff – FortisBC expressed an interest in BC Hydro's ability to a) provide the RC function in an independent manner from the BC Hydro BA and TOP functions, b) ensure transparency and independence of RC decisions, and c) have an operating agreement that would include a dispute resolution mechanism. BC Hydro believes the first two interests will be satisfied. BC Hydro will address the third interest in the establishment of arrangements for RC services as specified in BC Hydro's response to BCUC IR 1.9.7.2.**
- 2. BC Hydro RC department organization – FortisBC requested and BC Hydro provided more information on the organization of the BC Hydro RC department including the reporting structure to the executive and the**

<b>British Columbia Utilities Commission</b> Information Request No. 1.9.6 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

association to any BC Hydro BA and TOP staff. Please refer to BC Hydro's Response to BCOAPO IR 1.13.1.

3. CAISO RC option – FortisBC requested more information on the CAISO RC option and provided feedback that BC Hydro should be considering the most cost effective option for the registered entities of B.C.
4. RC costs – FortisBC expressed an interest in information from BC Hydro on transparency of costs associated with the RC function even if there are no plans to recover costs from the B.C. registered entities. BC Hydro will be reporting departmental costs in RRAs.
5. RC certification requirement – FortisBC expressed an interest in seeing an evaluation of BC Hydro's RC capabilities being completed. BC Hydro agrees, but does not agree with FortisBC's most recent request for a full certification evaluation. Please refer to BC Hydro's response to BCUC IR 1.7.1.
6. Overall project schedule – FortisBC expressed an interest in being kept apprised of the project schedule and plans to review and finalize procedures. BC Hydro will keep FortisBC informed as requested.
7. Procedures development – FortisBC expressed an interest in reviewing the procedures that BC Hydro is developing. Some of these procedures have been shared with FortisBC and they have provided some feedback. BC Hydro plans to continue to share procedures as they are developed.
8. Data specification associated with MRS IRO-010-2 – FortisBC expressed an interest in reviewing the data specification that would be required by BC Hydro to support RC operations. BC Hydro has not yet finalized this but will share with FortisBC when complete.
9. Contacts – FortisBC expressed an interest in BC Hydro developing a contacts sheet for the RC capability similar to what PEAK currently provides to entities. This would show the names, phone numbers and emails for all responsible roles within the RC group and could also include the BC Hydro BA and TOP functions. BC Hydro will prepare a contact sheet for the B.C. registered entities.
10. Restoration drills – FortisBC expressed an interest in BC Hydro providing restoration drills similar to what PEAK has provided. FortisBC was concerned that there would be an increased cost to them as the PEAK drills are currently available remotely and they can attend and receive continuing education hours without incurring travel costs. For information on BC Hydro's response please refer to BC Hydro's response to FBC IRs 1.14.1, and 1.14.3.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.7</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.7 Will operating agreements be reached with registered entities to ensure their interests are considered?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.7.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.7 Will operating agreements be reached with registered entities to ensure their interests are considered?

1.9.7.1 If so, please provide details on when this will be reached and if not, please provide a reason why not.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.7.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**9.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with Registered Entities  
Exhibit B-1, Section 5.3.1, p. 5-2  
Engagement activities**

BC Hydro states it had received five responses representing seven registered entities at the time of filing and three of the five responses expressed a level of support for BC Hydro performing the role of RC while the other two expressed a desire for more engagement with BC Hydro before providing a position.

Specifically, entities requested more information on RC roles and responsibilities, confirming data-sharing options, ensuring independence of the RC function; providing more information on California Independent System Operator (CAISO) as an option; and the need for independent evaluation of BC Hydro's RC capabilities.

Meetings were also held with FortisBC as the other major Transmission Operator (TOP) in BC to provide a verbal summary of BC Hydro's plan and to solicit direct feedback. These meetings provided an opportunity to inform operational and compliance staff to allow them to consider impacts to FortisBC's interests.

1.9.7 Will operating agreements be reached with registered entities to ensure their interests are considered?

1.9.7.2 Please provide an update on the anticipated timing of completion of the proposed draft of the governance model to support RC independence as well as the proposed RC Standards of Conduct. Please provide a copy of those documents in draft form if available.

**RESPONSE:**

**BC Hydro has identified the following documents related to governance and oversight of the RC:**

- 1. BC Hydro RC Standards of Conduct;**
- 2. RC Registered Entities Oversight Group Terms of Reference; and**
- 3. RC and BA/TOP Operations Working Group Terms of Reference.**

**The process for completing these documents includes finalizing drafts and sharing them with impacted entities for comment. BC Hydro expects the documents to be finalized by March 31, 2019.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.9.7.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

In addition to governance documents, it will be necessary to have RC to RC coordination agreements in place with AESO, PEAK, CAISO, and SPP. The AESO and PEAK agreements will need to be effective on BC Hydro's proposed go-live date of September 2, 2019. The CAISO agreement will need to be effective on CAISO's proposed go-live date for their expanded footprint on November 1, 2019. The SPP agreement will need to be effective on SPP's proposed go-live date of December 3, 2019. RC to RC coordination agreements are under development.

Prior to July 1, 2019, BC Hydro will also establish arrangements in consultation with B.C. registered entities for RC services that are expected to contain terms similar to those contained in the CAISO Reliability Coordinator Services Agreement, such as access and implementation of RC services, roles and responsibilities of the RC and registered entities, the onboarding period, integration testing and shadow operations, readiness requirements, dispute resolution procedures, confidentiality, and liability among other matters.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**10.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with RC Providers and Proposed RC Providers  
Exhibit B-1, Section 5.3.2, p. 5-3  
Engagement activities**

BC Hydro states:

As BC Hydro was considering the options for RC service, RC coordination meetings were held to discuss the transition of customers from PEAK to CAISO and SPP [Southwest Power Pool]. [...] Another key aspect of engagement with RC providers is the development of BC Hydro’s coordination agreements. These agreements will need to be in place prior to BC Hydro’s RC ‘go-live’ date.

1.10.1 Please provide an update on the ongoing engagement BC Hydro has had with PEAK, Alberta Electric System Operator (AESO) and other future RC providers.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.10.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**10.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with RC Providers and Proposed RC Providers  
Exhibit B-1, Section 5.3.2, p. 5-3  
Engagement activities**

BC Hydro states:

As BC Hydro was considering the options for RC service, RC coordination meetings were held to discuss the transition of customers from PEAK to CAISO and SPP [Southwest Power Pool]. [...] Another key aspect of engagement with RC providers is the development of BC Hydro's coordination agreements. These agreements will need to be in place prior to BC Hydro's RC 'go-live' date.

1.10.2 Has BC Hydro or another party considered establishing a working committee with current and future RCs across the Western Interconnection to address topics such as operations planning, data sharing, emergency procedures and training?

**RESPONSE:**

**BC Hydro, AESO, PEAK, SPP and CAISO have established working groups to manage the transition from PEAK to future RCs. These groups are coordinated by an RC Transition Coordination Group (RCTCG) led by a project manager with biweekly meetings. The RCTCG is also responsible for monitoring the orderly wind down of PEAK. Membership in the group is limited to the funding members of PEAK. The working groups cover the areas of:**

- **Operations Planning**
- **System Operating Limits/Seasonal Studies**
- **Tools**
- **Messaging**
- **Data Sharing**
- **Phasor Measurements/Historical Records**
- **Network Modelling**
- **Shadow Operations**
- **RC-RC coordination on Emergency Preparedness and Operations Restoration Drills.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**Updates on the activities and plans of the RCTCG can be found on the WECC website. No feedback from B.C. registered entities has been received to date.**

**While the present focus of these groups is to ensure a reliable and orderly transition in 2019 it is anticipated that several of the groups will remain active to manage ongoing and new topics post transition. BC Hydro is an active participant in these groups.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**10.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with RC Providers and Proposed RC Providers  
Exhibit B-1, Section 5.3.2, p. 5-3  
Engagement activities**

BC Hydro states:

As BC Hydro was considering the options for RC service, RC coordination meetings were held to discuss the transition of customers from PEAK to CAISO and SPP [Southwest Power Pool]. [...] Another key aspect of engagement with RC providers is the development of BC Hydro's coordination agreements. These agreements will need to be in place prior to BC Hydro's RC 'go-live' date.

1.10.2 Has BC Hydro or another party considered establishing a working committee with current and future RCs across the Western Interconnection to address topics such as operations planning, data sharing, emergency procedures and training?

1.10.2.1 If so, please provide the details and outline any feedback received from registered entities. If not, please explain the rationale for not establishing a working group.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.10.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**10.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with RC Providers and Proposed RC Providers  
Exhibit B-1, Section 5.3.2, p. 5-3  
Engagement activities**

BC Hydro states:

As BC Hydro was considering the options for RC service, RC coordination meetings were held to discuss the transition of customers from PEAK to CAISO and SPP [Southwest Power Pool]. [...] Another key aspect of engagement with RC providers is the development of BC Hydro’s coordination agreements. These agreements will need to be in place prior to BC Hydro’s RC ‘go-live’ date.

1.10.3 Please provide an update on the development of coordination agreements with current and proposed RC providers.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.9.7.2.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.10.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**10.0 E. STAKEHOLDER ENGAGEMENT**

**Reference: Stakeholder Engagement with RC Providers and Proposed RC Providers  
 Exhibit B-1, Section 5.3.2, p. 5-3  
 Engagement activities**

BC Hydro states:

As BC Hydro was considering the options for RC service, RC coordination meetings were held to discuss the transition of customers from PEAK to CAISO and SPP [Southwest Power Pool]. [...] Another key aspect of engagement with RC providers is the development of BC Hydro's coordination agreements. These agreements will need to be in place prior to BC Hydro's RC 'go-live' date.

1.10.3 Please provide an update on the development of coordination agreements with current and proposed RC providers.

1.10.3.1 Please explain the mitigation plans BC Hydro has in place in the event that other proposed RC providers are not fully certified as RC by WECC before BC Hydro's RC go-live date.

**RESPONSE:**

**BC Hydro's proposed RC go-live date is September 2, 2019. On that date, PEAK will still be the RC for the Western Interconnection except for B.C., AESO, and the state of California. Therefore, BC Hydro will be working with AESO and PEAK.**

**Prior to September 2, 2019, the only RC transition planned is for CAISO to assume the RC responsibilities for the entities within the state of California on July 1, 2019. BC Hydro is not expecting to work with CAISO RC as a neighbouring RC until they assume the RC responsibility for the expanded footprint in November 2019 which includes the BES directly south of B.C. As such, BC Hydro does not believe it is necessary to establish a mitigation plan.**

**SPP is becoming an RC in the Western Interconnection in December 2019 so therefore no mitigation plan is required prior to September 2, 2019.**

**Please refer to BC Hydro's response to BCUC IR 1.10.2 for details on coordination activities that are ongoing with other RCs during the transition period.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction  
Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3  
Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.1 Please clarify that currently there are no formally registered PA/PC for the province of British Columbia under the BCUC MRS program.

**RESPONSE:**

**As indicated in the January 1, 2019 B.C. Active Entities Report maintained by WECC on behalf of the BCUC, BC Hydro is registered as a PA/PC under the B.C. MRS Program; however the scope of the PA/PC function performed by BC Hydro is currently limited to BC Hydro’s asset footprint only.**

**Please also refer to BC Hydro’s response to BCUC IR 1.11.5.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction**  
**Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3**  
**Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.2 Please confirm or explain otherwise that currently no entity is acting as the PA/PC outside of the BC Hydro asset footprint.

**RESPONSE:**

**Confirmed.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction**  
**Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3**  
**Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.3 Please confirm that under the proposed Application, BC Hydro would assume RC responsibilities for all parts of the province, including territories outside of BC Hydro’s asset footprint.

**RESPONSE:**

**Confirmed.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.4</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction  
Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3  
Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.4 Please provide a list of jurisdictions in North America for which no PA/PC is formally registered.

**RESPONSE:**

**BC Hydro is unaware of any jurisdiction in North America in which no PA/PC is formally registered.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.5</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction  
Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3  
Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.5 If this Application is approved, would BC Hydro assume any responsibilities of PA/PC functions outside of its asset footprint?

**RESPONSE:**

**No. BC Hydro’s registration as RC for B.C. is not related to BC Hydro assuming the PA/PC function for the province.**

**The issues related to BC Hydro performing the PA/PC function for B.C. are unique to the performance of that function. BC Hydro filed a letter on February 24, 2017 to the BCUC providing its recommendation to become the PA/PC on a voluntary basis for all entities registered under the MRS Program in B.C.**

**BC Hydro is currently undergoing an internal analysis to clarify the delineation of responsibilities of the PA/PC in relation to TP functions, and identify gaps in data or gaps in responsibilities in relation to other registered entities (i.e., the assignment of TP responsibilities for other registered GOs and TOPs under the B.C. MRS Program as well as a clear delineation of roles/responsibilities between the PA/PC function and TP function on a per requirement basis). Discussions between BC Hydro and WECC will be ongoing and so far indicate that WECC is supportive in assisting BC Hydro and other B.C. registered entities with this process.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.5.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction  
Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3  
Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.5 If this Application is approved, would BC Hydro assume any responsibilities of PA/PC functions outside of its asset footprint?

1.11.5.1 If no, who will perform the PA/PC function in these territories?  
Please explain your response.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.11.5.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.11.6</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**11.0 F. RISK MANAGEMENT**

**Reference: Introduction**  
**Exhibit B-1, Section 1.2.1, Table 1-1, p. 1-3**  
**Function types in BC**

In the footer on page 1-3 of its Application, BC Hydro states: “The PC function is equated to the PA [Planning Authority] function through the NERC glossary. BC Hydro is registered as a PA in B.C. and so therefore is acting as the PA/PC for the BC Hydro Asset Footprint only.”

1.11.6 Would BC Hydro accept responsibility as the formal PA/PC for the province of BC in conjunction with registration as the RC?

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.11.5.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.12.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**12.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
Exhibit B-1, Section 6.2, p. 6-1  
Start-up risks**

BC Hydro states in its Application:

Most of the start-up risks are driven by the short timeline required to implement the RC role and the need to have people, process, and technology changes in place to begin parallel operations by summer 2019 and transition to independent operations by September 2019. These risks can be further characterized as 'internal' or 'external' depending on the primary source of the associated uncertainty. Refer to Table 6-1 for a tabular presentation of the start-up risks, potential impacts, and mitigations.

- 1.12.1 Please provide an assessment on implementation risk for each start-up risk identified in Table 6-1 and assign each a Low, Medium or High ranking for risk and provide the rationale for determining these risk assessments.

**RESPONSE:**

**Each start-up risk identified in Table 6-1 of the Application is updated below to include a risk ranking and rationale reflecting information as of January 14, 2019.**

- 1. Risk - Staffing uncertainty during transition of existing staff into RC roles.**
  - a. Risk Ranking – Low.**
  - b. Rationale – Since the identification of this risk in the Application, the majority of recruitment has taken place and BC Hydro departments that are providing staff to the RC function have been able to prepare for this gap. As the RC team is finalized, BC Hydro’s staffing requirements become clearer and impacted departments can plan accordingly for recruitment of new staff and prioritization of existing work.**
- 2. Risk – Availability of key internal BC Hydro resources to support project deliverables.**
  - a. Risk Ranking – Medium.**
  - b. Rationale – Key resources associated with the implementation of the RC could be unavailable and result in a project risk. Risk mitigation is to ensure that multiple resources are involved in work where key resources are identified. This risk will likely remain ranked as medium until the RC capabilities are substantially completed.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.12.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

3. **Risk – Delays in agreements with other RCs.**
  - a. **Risk ranking – Low.**
  - b. **Rationale – Draft agreements are underway with necessary RC counterparties. This risk will be closed once the agreements are ready for signing.**
4. **Risk – Data exchange requirements not in place for model updates and real-time monitoring.**
  - a. **Risk ranking – Low.**
  - b. **Rationale – This is a common risk for all current and prospective RCs with a shared interest in ensuring that the data exchange requirements are in place. Coordination efforts have focused on establishing a new data sharing agreement and agreeing on data transitions.**
5. **Risk – Uncertainty of sustainment of existing PEAK tools post wind down.**
  - a. **Risk Ranking – Low.**
  - b. **Rationale – The results of coordination efforts has determined that critical applications will remain available until PEAK winds down and the post wind down planning is well underway.**
6. **Risk – Delay in regulatory approval to support registration as RC.**
  - a. **Risk Ranking – Medium.**
  - b. **Rationale – The regulatory process is proceeding. There remains some uncertainty as to the potential for further process to obtain regulatory approval.**
7. **Risk – Peak unable to sustain operations until December 2019.**
  - a. **Risk Ranking – Low.**
  - b. **Rationale – PEAK has prepared its staffing plan to sustain operations until December 2019. PEAK has increased its operating budget to incent staff to stay until the end of 2019. BC Hydro expects that PEAK will remain operational as planned.**



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**13.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
Exhibit B-1, Section 6.2.2, pp. 6-2, 6-4  
External risks**

On page 6-2 of the Application, BC Hydro states:

BC Hydro will need to establish RC-to-RC agreements with all RCs operating in the Western Interconnection. While templates exist, the number of agreements and short timeline poses a risk to ensuring these are all in place in a timely manner before BC Hydro is operating as RC. These agreements will address issues such as operations coordination, data exchange, communication protocols, and emergency procedures.

For data exchange with other RCs in the Western Interconnection to occur – to support the RC function, BC Hydro will need to agree on the required data exchange with all RCs operating in the Western Interconnection. The scope of the data required will not be finalized until arrangements have been established with other RCs. Data exchange is required to support the operational analyses required for RC operations.

PEAK is unable to sustain operations until December 2019, as there is a risk that PEAK may not have the resources required to sustain RC operations as new RCs are established and become able to assume the RC responsibilities for the PEAK area. If this occurs, it will result in loss of RC oversight for the majority of the Western Interconnection, resulting in weakened coordination and management of regional risks and non-compliance with Reliability Standards. BC Hydro plans to have RC capabilities in place in BC by July 1, 2019 to support two months of shadow operations with PEAK before the transition.

1.13.1 Please provide an update of the agreements that have been established with existing and proposed RCs in the Western Interconnection.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.6.1.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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1.13.1 Please provide an update of the agreements that have been established with existing and proposed RCs in the Western Interconnection.

1.13.1.1 Please explain how these agreements will address operations coordination, data exchange, communication protocols and emergency procedures.

**RESPONSE:**

**The RC to RC coordination agreements are expected to provide identification of roles and responsibilities and address the following:**

**Operations Coordination:**

- **An operating committee will administer the agreement, review procedures, identify inconsistencies and propose solutions;**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

- **Sharing of operations planning and reliability assessments;**
- **Coordination of voltage control among RCs, TOPs and Bas; and**
- **Coordination of Unscheduled Flow.**

**Data and Information Exchange:**

- **Sharing of real time, energy schedule, outage, and modeling data;**
- **Sharing of operating plans; and**
- **Confidentiality.**

**Communication Protocols:**

- **Process for notification of loss of communication or tools;**
- **Facility evacuation plans and notification; and**
- **Communication methods.**

**Emergency Procedures:**

- **Processes for alleviating exceedance of limits;**
- **Identification and notification of emergencies and process for requesting assistance;**
- **Coordination of reliability issues; and**
- **Power system restoration coordination.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**13.0 F. RISK MANAGEMENT**

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1.13.2 Please explain the mitigation options BC Hydro has in place in the event that there are delays in the certification of future RCs (i.e. CAISO, SPP).

**RESPONSE:**

**Certification and/or assurance review is but one activity in a program of activities that BC Hydro, CAISO and SPP are undertaking to be ready to perform the RC function. Should there be delays in the certification of CAISO or SPP, BC Hydro will still be able to execute the responsibilities of the RC for B.C. in a manner compliant with the Reliability Standards.**

**CAISO’s initial certification for its existing BA is expected to be complete by June 1, 2019, and RC operations for the existing CAISO BA are expected to begin on July 1, 2019. CAISO then intends to recertify as an RC for the additional BAs by**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**October 1, 2019 and commence operation as RC for those BAs on November 1, 2019.**

**Delays in CAISO's certification timeline will mean that PEAK will continue to be the RC for CAISO and the entities that plan on joining CAISO until PEAK closes at the end of December 2019. BC Hydro would continue working on an RC-RC basis with PEAK until CAISO became certified to ensure reliability of the BES.**

**SPP plans to be re-certified by August 2019 and begin operations by December 3, 2019. Delays to SPP's certification would not impact BC Hydro significantly. There are no adjacencies between BC Hydro's footprint and that of SPP and each footprint has very little reliability impact on the other. Should SPP experience delays in certification, PEAK would remain the RC for those entities joining SPP until the end of 2019. BC Hydro would continue to work with PEAK until SPP became certified.**

**Please also refer to BC Hydro's response to BCUC IR 1.10.3.1.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.3</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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1.13.3 Please explain what mitigation plans BC Hydro has in place in the event that PEAK cannot provide RC capabilities before July 1, 2019 and if BC Hydro is unable to support two months of shadow operations.

**RESPONSE:**

**The shadow operations that BC Hydro is planning are to ensure a smooth transition by September 2, 2019. BC Hydro has no reason to expect that PEAK will be unable to provide RC services until that time.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**13.0 F. RISK MANAGEMENT**

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1.13.3 Please explain what mitigation plans BC Hydro has in place in the event that PEAK cannot provide RC capabilities before July 1, 2019 and if BC Hydro is unable to support two months of shadow operations.

1.13.3.1 Please explain how BC Hydro and other RCs in the Western Interconnection will mitigate the risks of weakened coordination and management and non-compliance with Reliability Standards if PEAK is unable to provide RC capabilities before July 1, 2019.

**RESPONSE:**

**BC Hydro and the other RCs in the Western Interconnection will continue to advance their transition plans to be able to perform the work associated with**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.13.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

complying with the RC related Reliability Standards if PEAK is unable to provide RC capabilities before the transition to new RCs.

BC Hydro already has many of the tools and capabilities required to meet the requirements of the RC related Reliability Standards. If PEAK dissolves any time prior to the establishment of new RCs there would be gaps in RC coverage. BC Hydro expects that it would work with CAISO, AESO, SPP and the larger U.S. BAs (such as Bonneville Power Administration, who also have significant study capabilities), to ensure that any risks associated with gaps are mitigated.



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.14.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**14.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
 Exhibit B-1, Section 6.2.2, p. 6-3; CAISO RC FAQs<sup>1</sup>, p. 2  
 External risks - core/non-core services**

In its Application, BC Hydro states:

Uncertainty of sustainment of existing PEAK RC tools post wind down – PEAK RC provides a number of tools today that are of interest to many of the RC's and BAs in the Western Interconnection that will continue to operate after PEAK dissolves. These included Enhanced Curtailment Calculator (used to determine energy curtailment amounts to address system overloads) and Western Interchange Tool (used for accounting of scheduled and actual interchange values), as well as other tools.

CAISO states in its RC FAQs that it plans to offer non-core hosted advanced network applications, including: State Estimator; Real Time Contingency Analysis; Study Power Flow and Contingency Analysis; and NERC CIP-014 Physical Security standards.

- 1.14.1 Are the tools that BC Hydro are uncertain PEAK will continue to provide core RC services If yes, please identify the tool(s), describe the risk and negative impact that could occur if they are not provided and how BC Hydro plans to mitigate this risk.

**RESPONSE:**

**No, none of the referenced tools are related to the provision of core RC services in the BC Hydro RC footprint. One of the referenced tools is related to the provision of core services in the CAISO RC service area, namely the Enhanced Curtailment Calculator, which BC Hydro would not use because it does not manage unscheduled flow on qualified paths.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.14.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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CAISO states in its RC FAQs that it plans to offer non-core hosted advanced network applications, including: State Estimator; Real Time Contingency Analysis; Study Power Flow and Contingency Analysis; and NERC CIP-014 Physical Security standards.

1.14.2 Please provide an update on the discussions BC Hydro has held with PEAK, AESO and future RCs to ensure PEAK’s existing RC tools are sustained post PEAK’s wind down.

**RESPONSE:**

**As noted in section 6.2.2 of the Application, BC Hydro has been working with PEAK, CAISO, AESO and SPP to determine which of PEAK’s tools are of interest to future RCs and how they should be sustained. Since the filing of the Application, CAISO has offered to take over the Enhanced Curtailment Calculator from PEAK, but this is not a tool that is needed by AESO or BC Hydro. CAISO has also offered to take over the contract for the Western Interchange Tool which is used by all BAs but is not related to the provision of core RC services.**

**The AESO, BC Hydro, CAISO and SPP RC Transition Coordination Group are collaborating to ensure the consistent oversight and application of the tools that will be used by all RCs.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.14.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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1.14.2 Please provide an update on the discussions BC Hydro has held with PEAK, AESO and future RCs to ensure PEAK's existing RC tools are sustained post PEAK's wind down.

1.14.2.1 Please provide an explanation of the required capabilities and associated costs with retaining existing PEAK tools.

**RESPONSE:**

**It is now apparent that the Western Interchange Tool is the only existing PEAK tool that BC Hydro will use. Its capabilities are used for accounting of scheduled and actual interchange values. A cost estimate to modify the tool for use by multiple RCs has been developed at approximately \$100,000 (USD). This cost is expected to be shared amongst RCs.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.14.2.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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1.14.2 Please provide an update on the discussions BC Hydro has held with PEAK, AESO and future RCs to ensure PEAK’s existing RC tools are sustained post PEAK’s wind down.

1.14.2.2 Please explain how these costs will be shared among the RCs operating in the Western Interconnection.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.14.2.1.**

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<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. 1.14.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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CAISO states in its RC FAQs that it plans to offer non-core hosted advanced network applications, including: State Estimator; Real Time Contingency Analysis; Study Power Flow and Contingency Analysis; and NERC CIP-014 Physical Security standards.

1.14.3 Please explain whether BC Hydro plans to offer (or acquire from a third party) the non-core services that CAISO plans to offer (including why and why not).

**RESPONSE:**

**BC Hydro already has a suite of advanced network applications that include State Estimation, Real Time Contingency Analysis, Study Power Flow and Contingency Analysis and has been using these applications in its role as BA and TOP for many years and plans to use them to fulfil its RC function. BC Hydro has no plans to offer the use of these applications to B.C. registered entities because it is unaware of any demand at present.**

**At this time, BC Hydro does not plan to offer third party verification services to meet the requirements of CIP-014 Physical Security Reliability Standards and has in the past acquired those services from another party to ensure its own compliance. BC Hydro's next risk assessment under this Reliability Standard will be due in April 2020 and BC Hydro will engage a third-party to perform this work before that date.**

**BC Hydro is not aware of any reliability impact as a result of its current decision to not provide the use of these applications or services to third-parties.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.14.3.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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1.14.3 Please explain whether BC Hydro plans to offer (or acquire from a third party) the non-core services that CAISO plans to offer (including why and why not).

1.14.3.1 If BC Hydro does not plan on offering these non-core services, please explain whether efficiency/reliability over the short and long-term could be negatively affected.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.14.3.**

<sup>1</sup> <https://www.caiso.com/Documents/ReliabilityCoordinatorFAQ.pdf>.

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.15.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**15.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
Exhibit B-1, Section 6.2.2, p. 6-4  
External risks - regulatory approval**

In its Application, BC Hydro includes a delay in regulatory approvals as an external risk.

1.15.1 Please identify any key steps BC Hydro needs to undertake to be able to provide RC services that BC Hydro is not planning to initiate until it has received has regulatory approval, and discuss whether there could be a net benefit from proceeding with these steps in advance of approval.

**RESPONSE:**

**Currently, BC Hydro is proceeding with all key steps necessary to establish RC services in parallel with the regulatory approval process. BC Hydro believes there is benefit in proceeding with all key steps to ensure that BC Hydro can most effectively demonstrate that it has established RC capabilities for WECC during the anticipated on-site visit in May 2019.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.16.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**16.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
Exhibit B-1, Section 6.2.1, pp. 6-1, 6-2; Section 4.2.1, p. 4-2;  
Section 1.2.1; p. 1-4; Appendix B, p. 33  
Internal risks - staffing**

BC Hydro describes staffing uncertainty and availability of key resources as an internal start-up risk in Section 6.2.1 of the Application. BC Hydro provides a proposed RC department structure on page 4-2 of the Application and states that it has, or will have, NERC-certified people, processes and tools to meet the requirements associated with the RC role on page 1-4. In Appendix B of the Application, BC Hydro describes RC staff training requirements (PER-003-1 and PER-004-02).

1.16.1 For each position identified on BC Hydro's RC organisation chart, please identify whether a staff member has already been identified to fill the role and whether the identified staff member has received NERC certification.

**RESPONSE:**

**The information provided is current as of January 17, 2019.**

<b>Position</b>	<b>Staff Member Identified to Fill Role (Yes/No)</b>	<b>Has received required NERC Reliability Certification (Yes/No)</b>
RC Manager	Yes	No
RC1	Yes	Yes
RC2	Yes	Yes
RC3	Yes	Yes
RC4	Yes	Yes
RC5	Yes	Yes
RC6	Yes	No
RC7	No	N/A - this position will require NERC certification.
RC Eng1	Yes	No
RC Eng2	Yes	No
RC Eng3	Yes	No
Compliance Engineer	No	N/A – this position will not require NERC certification.
Administrative Assistant	No	N/A – this position will not require NERC certification.



<b>British Columbia Utilities Commission</b> Information Request No. <b>1.16.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**16.0 F. RISK MANAGEMENT**

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Exhibit B-1, Section 6.2.1, pp. 6-1, 6-2; Section 4.2.1, p. 4-2;  
Section 1.2.1; p. 1-4; Appendix B, p. 33  
Internal risks - staffing**

BC Hydro describes staffing uncertainty and availability of key resources as an internal start-up risk in Section 6.2.1 of the Application. BC Hydro provides a proposed RC department structure on page 4-2 of the Application and states that it has, or will have, NERC-certified people, processes and tools to meet the requirements associated with the RC role on page 1-4. In Appendix B of the Application, BC Hydro describes RC staff training requirements (PER-003-1 and PER-004-02).

1.16.1 For each position identified on BC Hydro's RC organisation chart, please identify whether a staff member has already been identified to fill the role and whether the identified staff member has received NERC certification.

1.16.1.1 Please describe BC Hydro's strategy towards filling those roles with NERC-certified employees, and comment on whether changes to this strategy (for example, use of consultants or a change in hiring approach) could mitigate the internal RC risks.

**RESPONSE:**

**BC Hydro's strategy to fill the RC staff positions with NERC-certified employees has been to recruit for qualified candidates internal and external to BC Hydro and perform a standard selection process to identify the preferred candidates. Many of the candidates that applied already have the required NERC certification. BC Hydro expects to complete the recruitments by the end of January and have the selected staff transition into their roles by April 2019. For staff that do not already have the required NERC certification, it is expected that they will train and certify within a six-month period. All staff performing real-time work will require NERC certification prior to operating a desk, i.e., before September 2, 2019.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.16.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**16.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
Exhibit B-1, Section 6.2.1, pp. 6-1, 6-2; Section 4.2.1, p. 4-2;  
Section 1.2.1; p. 1-4; Appendix B, p. 33  
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1.16.2 Please estimate the date by when BC Hydro considers it will be able to meet PER-003-1 and PER-004-2 requirements, and describe: whether there is a meaningful risk that these requirements will not be met by that target date; the potential impact of that risk occurring; and the steps BC Hydro is taking to mitigate these risks.

**RESPONSE:**

**To meet the PER-003-1 and PER-004-2 requirements, sufficient staffing with personnel that have received NERC certification and demonstrated competence in the areas identified in PER-003-1 will be required. BC Hydro plans to be able to meet the PER-003-1 and PER-004-2 requirements by August 15, 2019, ahead of the planned go-live date of September 2, 2019.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.16.2.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**16.0 F. RISK MANAGEMENT**

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BC Hydro describes staffing uncertainty and availability of key resources as an internal start-up risk in Section 6.2.1 of the Application. BC Hydro provides a proposed RC department structure on page 4-2 of the Application and states that it has, or will have, NERC-certified people, processes and tools to meet the requirements associated with the RC role on page 1-4. In Appendix B of the Application, BC Hydro describes RC staff training requirements (PER-003-1 and PER-004-02).

1.16.2 Please estimate the date by when BC Hydro considers it will be able to meet PER-003-1 and PER-004-2 requirements, and describe: whether there is a meaningful risk that these requirements will not be met by that target date; the potential impact of that risk occurring; and the steps BC Hydro is taking to mitigate these risks.

1.16.2.1 Please explain whether BC Hydro is using, or could use, training resources developed by other RCs to mitigate internal risks.

**RESPONSE:**

**BC Hydro does not believe it will be helpful to use training resources developed by other RCs to mitigate internal risks. Training materials need to be developed that are relevant to BC Hydro's Job Task Analysis which will be specifically tailored to the RC requirements of the B.C. footprint. While there may be areas of overlap, there would also be significant work required to adapt any materials to the specific requirements for B.C. In addition, while BC Hydro's technology is based on industry-available platforms, it is customized and configured to the unique implementation for B.C. BC Hydro will consider leveraging other available training resources if they are applicable to B.C.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.16.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**16.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
 Exhibit B-1, Section 6.2.1, pp. 6-1, 6-2; Section 4.2.1, p. 4-2;  
 Section 1.2.1; p. 1-4; Appendix B, p. 33  
 Internal risks - staffing**

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1.16.3 Please provide an organization chart of Peak Reliability (PEAK) and the Alberta Electric System Operator (AESO) RC function, and comment on any significant difference between the staffing levels and expertise of these other RC functions compared to that proposed by BC Hydro.

**RESPONSE:**

**BC Hydro made requests to PEAK and AESO on January 4, 2019 to share organization charts as specified in their IR. AESO responded indicating they were not permitted to share their organization chart. A conversation took place with AESO to describe a high level of the way AESO has incorporated the RC function into their operations. PEAK has shared a high level slide describing their staffing.**

**AESO is an independent system operator and has integrated the RC function as part of its other roles to support the Alberta market and reliability requirements. The staffing complement reflects the unique needs of the Alberta system. There are generally a minimum of four personnel on-shift 24/7 to perform the combined function of the AESO real-time desks which includes the RC function, balancing function, market monitoring and transmission reliability monitoring.**

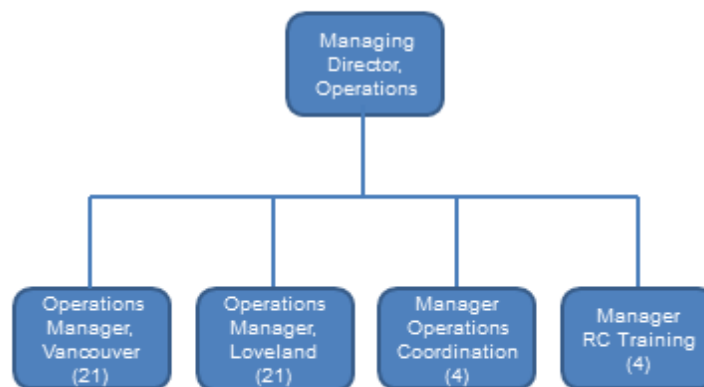
**PEAK provides RC service for a significant portion of the Western Interconnection encompassing 14 U.S. states, B.C. and part of Baja California from their control centers in Vancouver, Washington and Loveland, Colorado. This area encompasses a population of 74 million people. For PEAK's Operations group, there are 50 staff, as shown in the figure below. PEAK currently has six RCs on shift, one Shift Foreman, and one real-time engineer, for a total of eight personnel on-shift 24/7.**

<b>British Columbia Utilities Commission</b> Information Request No. 1.16.3 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

Figure 1 - Peak Operations Staff

## Organizational Chart - *Operations*

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In comparing the AESO and PEAK staff model to BC Hydro's proposed staffing model, BC Hydro does not believe there are significant differences in the numbers of personnel in light of the different RC areas. That is, the primary differences in staffing are related to the size of the PEAK footprint which is much larger than BC Hydro's and due to the added complexity of the AESO structure which is very different than BC Hydro's structure.

<b>British Columbia Utilities Commission</b> Information Request No. 1.17.1 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

**17.0 F. RISK MANAGEMENT**

**Reference: Risk Management  
 Exhibit B-1, Section 1.3.1, p. 1-4; Section 4.2.5, pp. 4-6, 4-7;  
 Section 6.3, p. 6-6  
 Internal risks - process and tools**

BC Hydro states on page 1-4 of the Application that it has, or will have, processes and tools in place to meet the requirements associated with the RC role. BC Hydro describes in Section 4.2.5 the modifications and enhancements to BC Hydro's tools that will be required.

BC Hydro states in Section 6.3 that WECC is considering changes to RC modelling requirements (IRO Standard 002-5) that may not support BC Hydro's preferred modelling methodology.

- 1.17.1 For new or modified information technology (IT) tools, please explain how BC Hydro ensures that changes made will be robust. Please include whether WECC Assurance review and/or Full certification will test these IT tools.

**RESPONSE:**

**BC Hydro has significant experience in implementing new and modified information technology tools. BC Hydro has developed change control processes and routinely applies these procedures to ensure any new or modified tools are tested and behave as expected prior to releasing the code into a production environment. This involves testing by technical experts on quality assurance systems. BC Hydro's change control process is in full compliance with CIP Reliability Standards related to change management.**

**BC Hydro believes that it will be required to demonstrate the functionality of any new or modified tools that are utilized to perform RC capabilities for either an assurance review or full certification. BC Hydro participates in MRS and CIP compliance programs and as such, has been subjected to regular compliance audits (every three years) conducted by WECC on behalf of BCUC.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.17.1.1</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**17.0 F. RISK MANAGEMENT**

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BC Hydro states in Section 6.3 that WECC is considering changes to RC modelling requirements (IRO Standard 002-5) that may not support BC Hydro's preferred modelling methodology.

1.17.1 For new or modified information technology (IT) tools, please explain how BC Hydro ensures that changes made will be robust. Please include whether WECC Assurance review and/or Full certification will test these IT tools.

1.17.1.1 Please explain whether BC Hydro is using, or could use, IT tools developed by other RCs to mitigate implementation risk.

**RESPONSE:**

**BC Hydro believes it has most of the IT tools required to develop RC capabilities. The existing tools require some modification and configuration to perform the RC capabilities. PEAK has offered to provide BC Hydro with modeling information and display configurations and BC Hydro is evaluating how this information can be incorporated into BC Hydro's IT tools to reduce the implementation work required.**

<b>British Columbia Utilities Commission</b> Information Request No. <b>1.17.1.2</b> Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**17.0 F. RISK MANAGEMENT**

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BC Hydro states in Section 6.3 that WECC is considering changes to RC modelling requirements (IRO Standard 002-5) that may not support BC Hydro's preferred modelling methodology.

1.17.1 For new or modified information technology (IT) tools, please explain how BC Hydro ensures that changes made will be robust. Please include whether WECC Assurance review and/or Full certification will test these IT tools.

1.17.1.2 Please explain whether there is a meaningful risk that these process/tools will not be in place by the required date; the potential impact of that risk occurring; and the steps BC Hydro is taking to mitigate these risks.

**RESPONSE:**

**BC Hydro expects that the processes and tools required to support RC capabilities will be substantially completed by April 2019. This will be required to support the delivery of training planned to commence in April 2019. BC Hydro believes there is minimal risk that the required processes and tools will not be in place by April 2019. In the case that some processes and/or tools are not fully ready by April 2019, BC Hydro intends to develop manual work arounds to ensure that compliance requirements can be met.**



<b>British Columbia Utilities Commission</b> Information Request No. 1.17.2 Dated: <b>December 21, 2018</b> British Columbia Hydro & Power January 23, 2019	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

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**Reference: Risk Management  
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BC Hydro states on page 1-4 of the Application that it has, or will have, processes and tools in place to meet the requirements associated with the RC role. BC Hydro describes in Section 4.2.5 the modifications and enhancements to BC Hydro's tools that will be required.

BC Hydro states in Section 6.3 that WECC is considering changes to RC modelling requirements (IRO Standard 002-5) that may not support BC Hydro's preferred modelling methodology.

1.17.2 Please explain what the implications would be of WECC selecting a modelling methodology for IRO Standard 002-5 that differs from BC Hydro's approach to modelling; whether there is a meaningful risk of that occurring; and what steps BC Hydro could take in advance to reduce the negative impact associated with that outcome.

**RESPONSE:**

**The original proposal for the IRO-002-5 Reliability Standard variance stipulated the requirement for all RCs to model the network representing the entire Western Interconnection. This proposal was later amended by the WECC IRO-002-5 drafting team to replace the requirement for each RC to model the entire network with a requirement for all RCs to have a common methodology for identifying and using a reduced model of the network. The new proposed requirement is fully aligned with the current methodology used by BC Hydro. Once the IRO-002-5 Reliability Standard variance is enacted, the RCs in the Western Interconnection will form a task force to develop and approve the common methodology to meet the requirement of the IRO-002-5 Reliability Standard variance. There is a high probability that the methodology currently employed by BC Hydro will be consistent with that methodology. Consequently, the adjustments to the Energy Management System (EMS) applications and model maintenance process for BC Hydro are expected to be of low impact. However, any changes to EMS modeling and maintenance process, if required, will be thoroughly reviewed and tested before being formally implemented in BC Hydro RC operations process.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**1.0 Reference: Exhibit B-1, page 2-1**

“PEAK Reliability was founded on January 1, 2014 to provide RC services and BC Hydro executed a five-year membership agreement with PEAK effective October 2014.”

1.1.1 Please explain why BC Hydro did not propose becoming the Reliability Coordinator for British Columbia in 2014, before it contracted with PEAK Reliability for RC Services. What analysis did BC Hydro perform in 2014 that led it to contracting with PEAK Reliability, rather than taking on the role of RC for B.C. at that time?

**RESPONSE:**

**In 2013, BC Hydro reviewed its options for procuring RC services prior to contracting with PEAK. While BC Hydro determined there were benefits for establishing RC services within BC Hydro, it also found benefits in furthering relationships with other PEAK members. In light of PEAK’s dissolution and an increase in the number of RCs, the 2013 logic is no longer compelling.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**1.0 Reference: Exhibit B-1, page 2-1**

“PEAK Reliability was founded on January 1, 2014 to provide RC services and BC Hydro executed a five-year membership agreement with PEAK effective October 2014.”

1.1.2 What has changed since 2014 such that BC Hydro now proposes to take on the role of RC for B.C.?

**RESPONSE:**

**A narrative of developments in the RC landscape since 2014 is provided in section 2.1 of the Application. The dissolution of PEAK by December 31, 2019 and an analysis of alternatives for providing RC services as presented in the Application are the driving reasons why BC Hydro is proposing to take on the role of RC for B.C.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.1 Please provide an update of the expected costs for CAISO to provide RC services for B.C. Please explain more fully how CAISO charges for RC Services. For example, does CAISO send invoices for RC services to the Balancing Authority, the Transmission Operator, or some other entity associated with loads and/or generation.

**RESPONSE:**

**BC Hydro does not have any updated costs beyond those noted in the Application. BC Hydro notes that CAISO’s application for RC services, which was filed with FERC in August 2018, was approved by FERC on November 14, 2018.**

**Section IIB of the FERC ruling on CAISO’s application describes how CAISO will recover the costs of providing RC services to RC customers through an RC service charge. CAISO will send invoices to the BAs with load and transmission operators, Generation-only BAs, and any TOPs that take RC services from CAISO.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.2 Please identify which entities have contracted for CAISO for RC services, and which have indicated they propose to do so, and the load associated with each.

**RESPONSE:**

On January 14, 2019 the CAISO provided an update on their website listing those entities (BAs and their TOPs) that have finalized RC arrangements with CAISO. Those entities are listed below. BC Hydro does not have access to information on the load associated with each of these entities. Some entities are generation-only BAs. As noted in section 2.1 of the Application, as of September 2018, entities approximating 72 per cent of the demand in the Western Interconnection had selected CAISO.

1. Avista
2. Avangrid
3. Arizona Public Service
4. Balancing Authority of Northern California
5. Bonneville Power Administration-Transmission
6. California ISO
7. Chelan County PUD
8. Grant County PUD
9. Imperial Irrigation District
10. Idaho Power Company
11. NaturEner
12. NorthWestern Energy
13. NV Energy
14. PacifiCorp

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

- 15. **Portland General Electric**
- 16. **Public Service Co. of New Mexico**
- 17. **Puget Sound Energy**
- 18. **Seattle City Light**
- 19. **Salt River Project**
- 20. **Turlock Irrigation District**
- 21. **Tacoma Power**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.3 Please provide a comparison table of B.C.’s load compared to the loads of other entities that have either contracted with, or propose to contract with, CAISO for the provision of RC services.

**RESPONSE:**

**As stated in section 3.3.4 of the Application, B.C.’s load is 62,325,597 MWh.**

**Please refer to BC Hydro’s response to Catalyst IR 1.2.2.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.4</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.4 Please confirm that the range of costs associated with CAISO providing RC services to B.C. (\$1.60 - \$4.70 million CAD from a total of \$5 - \$19 million USD) suggests that B.C. load is approximately 20 percent of the entire load under CAISO’s RC jurisdiction.

**RESPONSE:**

**Not Confirmed. CAISO projected that their RC funding requirement would be somewhere between \$5 million and \$19 million (USD) depending on the actual RC footprint. In their June 2018 draft proposal they noted that dividing these amounts by the projected volumes (load) in the RC area yields an estimated rate somewhere near the \$0.02/MWh to \$0.06/MWh range.**

**BC Hydro did not and does not have the information on the projected volumes (load) in the RC area being modeled in CAISO’s financial analysis, or whether the relationship between volume and rate is linear or not.**

**However, assuming some economies of scale, one could infer that the \$19 million (USD) total cost relates to the largest footprint yet results in the lowest overall cost per member of \$0.02/MWh (USD). Based on this assumption one could infer that under Alternative 2, BC Hydro’s membership costs at \$1.6 million CAD (\$1.3 million USD) would represent 6.8 per cent of the \$19 million (USD) overall costs and therefore 6.8 per cent of the load under CAISO’s RC jurisdiction.**

**BC Hydro has been paying approximately 7 per cent of PEAK’s funding requirements based on its percentage of load under PEAK’s jurisdiction. With CAISO taking on RC responsibility for most but not all of PEAK’s members it is reasonable to assume that if BC Hydro were to take service from CAISO its dues would be based on a percentage that is slightly higher than 7 per cent but not as much as 20 per cent.**



<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.5</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.5 Which entity will be providing RC services for Bonneville Power Administration?

**RESPONSE:**

**Bonneville Power Administration Transmission has announced they have selected CAISO as their RC provider. Please refer to BC Hydro’s response to Catalyst IR 1.2.2.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.2.6</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**2.0 Reference: Exhibit B-1, page 3-2**

“By June 2018 CAISO had increased their cost estimate to between \$5 and \$19 million (USD) with an estimate that customers would be charged between \$0.02-0.06 (USD) per MWh of load.”

1.2.6 Please discuss whether economies of scale exist, such that when more entities (loads) contract with a single RC services provider (for example, CAISO), the unit cost for each entity decreases.

**RESPONSE:**

**It is reasonable to expect that economies of scale exist to a point. Each time an RC provider’s footprint expands such that they need to open additional control room desks and hire new staff to take on the incremental responsibilities there may be increases in costs to each existing entity.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.3.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**3.0 Reference: Exhibit B-3, Slide 22, RC Independence**

- 1.3.1 Please explain how Registered Entities (other than BC Hydro) will participate in the RC Registered Entities Oversight Group to ensure the RC acts “in the best interests of their RC area and the Interconnection before the individual interests of any single entity.”

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IRs 1.5.3 and 1.9.7.2.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.3.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**3.0 Reference: Exhibit B-3, Slide 22, RC Independence**

1.3.2 Please provide the governance model BC Hydro has drafted to support opportunities for MRS registered entities to stay engaged on RC activities.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.3.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**3.0 Reference: Exhibit B-3, Slide 22, RC Independence**

1.3.3 Does BC Hydro's governance model allow for an MRS technical working group consisting of representatives from Registered Entities to participate in technical, operational and administrative assessments of the implementation of MRS standards in British Columbia?

**RESPONSE:**

**Since only a subset of the Reliability Standards apply to the RC function, an MRS technical working group performing assessments of the implementation of Reliability Standards in B.C. would be out of scope for the governance model for the RC function.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.4.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

**4.0 Reference: Exhibit B-3, Slide 23, RC Registered Entities Oversight Group**

1.4.1 Please describe more fully the structure, the membership criteria,  
and the role of the RC Registered Entities Oversight Group.

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IRs 1.5.3 and 1.5.3.2.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.4.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**4.0 Reference: Exhibit B-3, Slide 23, RC Registered Entities Oversight Group**

1.4.2 What role will the RC Registered Entities Oversight Group have in the annual MRS assessment report process?

**RESPONSE:**

**RC-related issues that are discussed and managed within this group could inform entities' feedback into the annual MRS assessment report.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.4.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**4.0 Reference: Exhibit B-3, Slide 23, RC Registered Entities Oversight Group**

1.4.3 What mandate will the RC Registered Entities Oversight Group have to consult with Registered Entities in British Columbia for the development of MRS policies and procedures?

**RESPONSE:**

**It is expected that the Terms of Reference for the RC Registered Entities Oversight Group will include the registered entities of B.C. Entities that participate in the RC Registered Entities Oversight Group may comment and provide input on the development of RC policies and procedures that may be required to comply with the adopted Reliability Standards in B.C.**



<b>Catalyst Paper Corporation</b> Information Request No. <b>1.5.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 Reference: Exhibit B-3, Slide 24, RC and BA/TOP Operations Working Group**

1.5.1 Please describe more fully the structure, the membership criteria, and the role of the RC and BA/TOP Operations Working Group.

**RESPONSE:**

**The structure, membership criteria, and role of the RC and BA/TOP Operations Working Group has not been developed beyond the information presented in slide 24 of the BC Hydro Workshop Presentation (Exhibit B-3), and in BC Hydro's response to BCUC IR 1.5.3.**

<b>Catalyst Paper Corporation</b> Information Request No. <b>1.5.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

**5.0 Reference: Exhibit B-3, Slide 24, RC and BA/TOP Operations Working Group**

1.5.2 Please describe how the roles of the RC Registered Entities Oversight Group and RC and BA/TOP Operations Working Group will interact?

**RESPONSE:**

**There may be some interaction between the two groups. The RC and BA/TOP Operations Working Group will be focused on real time operational processes specific to BAs and TOPs. The Registered Entities Oversight Group membership will be broader and is expected to include the BCUC staff. This group could address issues arising in the RC and BA/TOP Operations Working Group that require policy changes to be made in how the RC function is implemented in B.C.**

**RC staff and representatives of BAs or TOPs could be common members on both groups.**

FortisBC Inc. Information Request No. 1.1.1 Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 1.0 Governance and Oversight

Reference: **RC Department Structure  
Exhibit B-1, Figure 4-1, Page 4-2:**

- 1.1.1 Please provide the complete organizational structure, including the executive level, for the RC and other BC Hydro registered functions that will interact with the RC.

### RESPONSE:

Figure 4-1 of the Application identifies the organizational structure of the RC group and shows it reporting to the Director of T&D System Operations.

Attachment 1 of BC Hydro's response to BCOAPO IR 1.13.1 shows BC Hydro's organizational structure up to the executive level.

The table below maps the BC Hydro registered functions to various business units shown in the attachment. If a business unit is expected to interact regularly with an RC in a real time or day ahead basis it is identified in the table. Some interactions will happen on an infrequent basis between the RC and the TP and/or PA/PC to share planning assessments and information on reliability issues arising from the operation of the system.

Function Type	Acronym	BC Hydro Business Unit	Interacts Regularly with RC (Y/N)
Balancing Authority	BA	T&D System Operations	Y
Distribution Provider	DP	T&D System Operations	Y
Generator Operator	GOP	T&D System Operations Generation System Operations	Y
Generator Owner	GO	Stations Asset Planning	N
Planning Authority/Planning Coordinator	PA/PC	Line Asset Planning	N
Reliability Coordinator	RC	T&D System Operations (proposed)	N/A
Resource Planner	RP	Line Asset Planning Energy Planning & Analytics	N

<b>FortisBC Inc.</b> Information Request No. <b>1.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

<b>Function Type</b>	<b>Acronym</b>	<b>BC Hydro Business Unit</b>	<b>Interacts Regularly with RC (Y/N)</b>
<b>Transmission Owner</b>	<b>TO</b>	<b>Line Asset Planning Station Asset Planning</b>	<b>N</b>
<b>Transmission Operator</b>	<b>TOP</b>	<b>T&amp;D System Operations</b>	<b>Y</b>
<b>Transmission Planner</b>	<b>TP</b>	<b>Line Asset Planning</b>	<b>N</b>
<b>Transmission Service Provider</b>	<b>TSP</b>	<b>T&amp;D System Operations</b>	<b>Y</b>

<b>FortisBC Inc.</b> Information Request No. <b>1.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **2.0 Governance and Oversight**

**Reference: Governance and Oversight Documents**

- 1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.2.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 2.0 Governance and Oversight

**Reference: Governance and Oversight Documents**

1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.

1.2.1.1 For each document, please provide the current status and the process and timeline to completion.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.2.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **2.0 Governance and Oversight**

**Reference: Governance and Oversight Documents**

1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.

1.2.1.2 For each document, please state whether BC Hydro anticipates input and/or approval of affected registered entities.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.2.1.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **2.0 Governance and Oversight**

### **Reference: Governance and Oversight Documents**

- 1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.
  - 1.2.1.2 For each document, please state whether BC Hydro anticipates input and/or approval of affected registered entities.
    - 1.2.1.2.1 If BC Hydro considers that input and/or approval of registered entities is not required please explain why not.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**



<b>FortisBC Inc.</b> Information Request No. <b>1.2.1.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **2.0 Governance and Oversight**

**Reference: Governance and Oversight Documents**

1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.

1.2.1.3 Please state whether BC Hydro considers that BCUC approval of the documents identified is required.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.12.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.2.1.3.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **2.0 Governance and Oversight**

### **Reference: Governance and Oversight Documents**

1.2.1 Please provide a list of all completed and outstanding documents related to standards of conduct, governance, and oversight of the RC.

1.2.1.3 Please state whether BC Hydro considers that BCUC approval of the documents identified is required.

1.2.1.3.1 If approval is not required, please explain why not.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCOAPO IR 1.12.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.3.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

### 3.0 Governance and Oversight

**Reference: Standards of Conduct  
Exhibit A-4, BCUC IR 1.5.2.2 to BC Hydro**

“If applicable, please provide other Standards of Conduct that have been adopted in other provinces.”

1.3.1 If BC Hydro considers that a standard of conduct adopted in another province is not applicable, please explain.

**RESPONSE:**

**Please refer to BC Hydro’s response to BCUC IR 1.5.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.4.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

#### 4.0 Governance and Oversight

**Reference: Proposed Code of Conduct  
Transcript Volume 1, page 39 lines 9 - 11**

For example, Hydro Quebec is something that FortisBC has shared with us that may be something that we could learn from in terms of what's appropriate for B.C.

1.4.1 Is BC Hydro agreeable to adapting the Hydro Quebec Reliability Coordinator Code of Conduct (Attachment 4) for use in BC?

**RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.4.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

#### 4.0 Governance and Oversight

**Reference: Proposed Code of Conduct  
Transcript Volume 1, page 39 lines 9 - 11**

For example, Hydro Quebec is something that FortisBC has shared with us that may be something that we could learn from in terms of what's appropriate for B.C.

1.4.1 Is BC Hydro agreeable to adapting the Hydro Quebec Reliability Coordinator Code of Conduct (Attachment 4) for use in BC?

1.4.1.1 If yes, what changes, if any, would be required? Please explain.

#### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.4.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

#### 4.0 Governance and Oversight

**Reference: Proposed Code of Conduct  
Transcript Volume 1, page 39 lines 9 - 11**

For example, Hydro Quebec is something that FortisBC has shared with us that may be something that we could learn from in terms of what's appropriate for B.C.

1.4.1 Is BC Hydro agreeable to adapting the Hydro Quebec Reliability Coordinator Code of Conduct (Attachment 4) for use in BC?

1.4.1.2 If no, why does BC Hydro not consider the Hydro Quebec Code of Conduct appropriate to the BC context?

#### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.5.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.5.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 5.0 Governance and Oversight

Reference: **Services Agreement**

- 1.5.1 Does BC Hydro plan to enter into a Reliability Coordinator Services Agreement similar to that of CAISO (Attachment 5) with BC registered entities to provide RC services?

### RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.7.2.

<b>FortisBC Inc.</b> Information Request No. <b>1.5.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 5.0 Governance and Oversight

**Reference: Services Agreement**

1.5.1 Does BC Hydro plan to enter into a Reliability Coordinator Services Agreement similar to that of CAISO (Attachment 5) with BC registered entities to provide RC services?

1.5.1.1 If not, please explain.

### **RESPONSE:**

**Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**



<b>FortisBC Inc.</b> Information Request No. <b>1.6.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 6.0 Governance and Oversight

Reference: **Oversight Group  
Exhibit B-3, BC Hydro Workshop Presentation, slide 23**

1.6.1 Which functional groups will be represented in the proposed RC Registered Entities oversight group?

### RESPONSE:

The RC Registered Entities Oversight Group was referenced on slide 23 of the BC Hydro Workshop Presentation (Exhibit B-3). As stated on transcript page 40, BC Hydro intends to invite all B.C. registered entities to be included in the RC Registered Entities Oversight Group. This would allow for all functional groups to have representation.

<b>FortisBC Inc.</b> Information Request No. <b>1.6.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **6.0 Governance and Oversight**

**Reference: Oversight Group  
Exhibit B-3, BC Hydro Workshop Presentation, slide 23**

1.6.1 Which functional groups will be represented in the proposed RC Registered Entities oversight group?

1.6.1.1 Will all registered entities for those functions be members of the oversight group?

### **RESPONSE:**

**Please refer to BC Hydro's response to FBC IR 1.6.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.6.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## **6.0 Governance and Oversight**

**Reference: Oversight Group  
Exhibit B-3, BC Hydro Workshop Presentation, slide 23**

1.6.1 Which functional groups will be represented in the proposed RC Registered Entities oversight group?

1.6.1.2 If not, on what basis does BC Hydro anticipate that membership would be determined?

### **RESPONSE:**

**Please refer to BC Hydro's response to FBC IR 1.6.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.7.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 7.0 Governance and Oversight

**Reference: Oversight Group  
Exhibit A-4, BCUC IR 1.5.3.5 to BC Hydro**

If it was determined that the adopted model was not effective, please explain how BC Hydro would transition to a new more effective model.

1.7.1 Please confirm BC Hydro’s understanding that a “new more effective model” as suggested in BCUC IR 1.5.3.5 refers to a model inclusive of BC registered entities.

### **RESPONSE:**

**“A new more effective model” are not BC Hydro’s words and BC Hydro cannot confirm what was meant by them. Nevertheless, BC Hydro confirms that under its governance model all B.C. registered entities will be invited to participate in the RC Registered Entities Oversight Group.**

<b>FortisBC Inc.</b> Information Request No. <b>1.8.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 8.0 Governance and Oversight

**Reference: Governance Risk  
Table 3-1, Section 3.3, page 3-4, page 3-7 Line 25 to page 3-8  
Line 1  
Transcript Volume 1, page 51, lines 4-9**

Table 3-1 of BC Hydro's application indicates that the CAISO Governance Risk was rated as "Medium".

At pages 3-7 to 3-8, BC Hydro states:

*"It is proposed that entities that plan to join CAISO's RC would have membership in an Oversight Committee that would provide input and guidance to CAISO on the operations and performance of the RC. However, the CAISO board of directors would ultimately have final say regarding decisions involving the CAISO RC and at this time, only the state of California is able to appoint members to CAISO's board of directors."*

Mr. Choudhury states at T51 that:

*"The rules under which the California RC will be operating will be derived from rules that are established in the State of California, for the State of California, and we would have limited ability to be able to influence or participate in the development of those rules."*

1.8.1 Please confirm that the CAISO rules which are of concern to BC Hydro relate to the restrictions regarding appointment of members to CAISO's board of directors. If BC Hydro has broader or other concerns with the CAISO rules, please explain.

### **RESPONSE:**

**Not confirmed. BC Hydro has no issue with CAISO rules regarding appointment of members to CAISO's board of directors. BC Hydro's broader concern, as discussed on page 3-8 of the Application, is that given the number of stakeholders and the proposed governance model for CAISO, B.C.'s interests in the operation of the CAISO RC, and any rules associated with that operation, may not be well protected by BC Hydro's limited influence.**

<b>FortisBC Inc.</b> Information Request No. <b>1.8.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 8.0 Governance and Oversight

**Reference: Governance Risk  
Table 3-1, Section 3.3, page 3-4, page 3-7 Line 25 to page 3-8  
Line 1  
Transcript Volume 1, page 51, lines 4-9**

Pursuant to section 19.11 of CAISO's TARIFF (Attachment 8a), subsequently approved by FERC (Docket No. ER18-2366-000 issued on November 14, 2018), CAISO will establish a Reliability Coordinator Oversight Committee and charter that provides RC customer input and oversight to the CAISO' provision of RC Services.

1.8.2 Did BC Hydro consider the CAISO RC Oversight Committee Charter (Attachment 8b) in its evaluation of the governance risk for Alternative 2?

### **RESPONSE:**

**Confirmed. BC Hydro received a draft of the CAISO RC Oversight Committee on August 8, 2018 and considered it in the evaluation of governance risk for Alternative 2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.8.2.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 8.0 Governance and Oversight

**Reference: Governance Risk  
Table 3-1, Section 3.3, page 3-4, page 3-7 Line 25 to page 3-8  
Line 1  
Transcript Volume 1, page 51, lines 4-9**

Pursuant to section 19.11 of CAISO's TARIFF (Attachment 8a), subsequently approved by FERC (Docket No. ER18-2366-000 issued on November 14, 2018), CAISO will establish a Reliability Coordinator Oversight Committee and charter that provides RC customer input and oversight to the CAISO' provision of RC Services.

1.8.2 Did BC Hydro consider the CAISO RC Oversight Committee Charter (Attachment 8b) in its evaluation of the governance risk for Alternative 2?

1.8.2.1 If not, does the approval of CAISO's tariff amendment impact BC Hydro's ranking of governance risk for Alternative 2?

### RESPONSE:

**Please refer to BC Hydro's response to FBC IR 1.8.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.9.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 9.0 Governance and Oversight

**Reference: Independent Review of RC Proposal  
Exhibit B-3, BC Hydro Workshop Presentation, slide 18**

Prior to approval/implementation of CAISO's tariff application for provision of RC services, the Western Interconnection Regional Advisory Body (WIRAB) was afforded the opportunity to comment on the CAISO RC services proposal (Attachment 9).

BC Hydro intends to meet with WIRAB in February 2019.

1.9.1 What is the purpose and scope of the intended meeting with WIRAB? Does BC Hydro intend that WIRAB will conduct an independent review of the RC proposal similar to WIRAB's review of the CAISO RC proposal?

### **RESPONSE:**

**BC Hydro has been invited to a meeting between WIRAB and Government representatives from B.C. and Alberta to provide an update on RC developments in B.C. BC Hydro does not intend for WIRAB to conduct a review of BC Hydro's RC proposal.**



<b>FortisBC Inc.</b> Information Request No. <b>1.9.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

## 9.0 Governance and Oversight

**Reference: Independent Review of RC Proposal  
 Exhibit B-3, BC Hydro Workshop Presentation, slide 18**

Prior to approval/implementation of CAISO's tariff application for provision of RC services, the Western Interconnection Regional Advisory Body (WIRAB) was afforded the opportunity to comment on the CAISO RC services proposal (Attachment 9).

BC Hydro intends to meet with WIRAB in February 2019.

- 1.9.2 Please comment on the advisability of adopting in BC an independent decision-making body to oversee the RC activities and provide transparency into the RC's decision-making processes such as that recommended by WIRAB (Part 2, Governance) for CAISO.

### RESPONSE:

**Given the size of the CAISO market both in footprint and number of entities that it covers, as well as the fact that CAISO is also the market operator for much of that footprint, it is reasonable that WIRAB, given its statutory role in the U.S., might recommend an independent decision-making body to oversee the CAISO's RC activities and provide transparency into their decision-making processes.**

**Given the much smaller footprint and fewer number of entities to be covered by BC Hydro as RC for B.C., as well as the lack of any market operation within B.C., BC Hydro does not see the need for an independent decision-making body to oversee RC activities or decision-making processes. BC Hydro has been fulfilling the role of BA for the province for many years without the need for oversight other than that already provided by the BCUC.**

<b>FortisBC Inc.</b> Information Request No. <b>1.10.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 10.0 Governance and Oversight

Reference: **Dispute Resolution**

1.10.1 How does BC Hydro propose that disputes between the RC and registered entities be resolved?

### RESPONSE:

**BC Hydro will include dispute resolution procedures in the arrangements with B.C. registered entities. Please refer to BC Hydro's response to BCUC IR 1.9.7.2.**

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 5
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 11.0 Operational Issues

### Reference: Operational Documents

- 1.11.1 Please provide a listing of all existing and new operational documents required for BC Hydro to assume the RC role.

### RESPONSE:

The following table shows the operational documents that are being created by BC Hydro to assume the RC role, the purpose of each document and a summary of the impacted entities.

The process for completion includes finalizing draft documents by completing an internal review for each document, followed by sharing of documents with impacted entities for comments and suggestions. All documents are currently in draft. The target date for completion of all documents is March 31, 2019.

Operational Documents	Purpose	Impacted Entities
BC Reliability Coordinator Reliability Plan	The BC Reliability Coordinator Reliability Plan describes the processes implemented as the RC responsible for coordinating and promoting BES reliability within its RC area.	N/A
BC Reliability Coordinator Operating Order Review and Approval Process	Defines the process for reviewing and approving changes to B.C. Reliability Coordinator Operating Orders	B.C. (RC,BA,GO, GOP,TO, TOP,DP)
Reliability Coordinator Authority	Provides the RC with a clear understanding of their authority and responsibility to act to address the reliability of the B.C. RC area.	B.C. (RC,TOP,BA, GOP,DP)
Coordination Among Reliability Coordinators	Defines the exchange of information and coordination to ensure that each of the RC operations are conducted in such a manner that they will not have an adverse reliability impact on other RC areas and to preserve the reliability benefits of interconnected operations.	RCs in the Western Interconnection

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 2 of 5
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

<b>Operational Documents</b>	<b>Purpose</b>	<b>Impacted Entities</b>
<b>Communications Systems Monitoring and Testing</b>	<b>Establishes the interpersonal communication capabilities necessary to maintain reliability and to ensure adequate monitoring and testing of telecommunications systems.</b>	<b>B.C. RC</b>
<b>B.C. Reliability Coordinator – FortisBC Joint Operating Procedures</b>	<b>Details the operating relationship between the B.C. RC and FortisBC.</b>	<b>B.C. RC, FortisBC</b>
<b>BCRC IRO-010-2 Data spec</b>	<b>Provides a documented specification to applicable functional entities of the data necessary for the B.C. RC to perform its Reliability Coordinator Operational Planning Analyses, Real-time monitoring, and Real-time Assessments.</b>	<b>B.C. (RC,BA,GO, GOP,TO,TOP,DP)  RCs in the Western Interconnection</b>
<b>Quality of Real-Time Data and Assessments</b>	<b>Provides the RC with established procedures to:</b> <ul style="list-style-type: none"> <li>• <b>Address the quality of the Real-time data necessary to perform Real-time Monitoring and Real-time Assessments (RTAs) when data quality affects RTAs;</b></li> <li>• <b>Address the quality of analysis used affecting RTAs; and</b></li> <li>• <b>Respond to the EMS alarm process monitor which provides notification when a failure of the EMS alarm processor occurs.</b></li> </ul>	<b>B.C. RC</b>
<b>Response to Loss of Real-Time Data and Tools</b>	<b>Provides the RC with a set of actions:</b> <ul style="list-style-type: none"> <li>• <b>To ensure the quickest possible remedy upon loss of EMS data and/or related tools;</b></li> <li>• <b>To maintain situational awareness of the state of the B.C. RC area; and</b></li> <li>• <b>To continue to perform Real-time Assessments at least every 30 minutes.</b></li> </ul>	<b>B.C. RC</b>
<b>Dynamic Disturbance Recording List</b>	<b>Lists the BES Elements for which Dynamic Disturbance Recording data is required to meet requirements in the Reliability Standard PRC-002-2 (Disturbance Monitoring and Reporting Requirements).</b>	<b>B.C. (RC,TO,GO)</b>

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 3 of 5
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

Operational Documents	Purpose	Impacted Entities
BC Reliability Coordinator SOL Methodology	Establishes the methodology to be used in the B.C. RC area for developing System Operation Limits (SOLs) and Interconnection Reliability Operating Limits (IROLs) for use in the Operations Horizon pursuant to Reliability Standards FAC-011-3 and FAC-014-2.	B.C. (RC, TOP, TP, PA/PC)  RCs in the Western Interconnection
Outage Coordination Process	<ul style="list-style-type: none"> <li>Provides a process for coordination of transmission and generation outages within the B.C. RC area.</li> <li>Describes the applicable functional entity roles and responsibilities.</li> <li>Facilitates compliance with Reliability Standard IRO-017-1 by ensuring that outages are properly coordinated in the Operations Planning time horizon.</li> </ul>	B.C. (RC, TOP, BA, PA/PC, TP)  RCs in the Western Interconnection
Next Day Operational Planning Analysis	Provides established procedures to perform Operations Planning Analyses which assesses whether planned operations for the next-day will exceed SOLs and IROLs within the B.C. RC wide area.	B.C. (RC, TOP, BA)  RCs in the Western Interconnection
Monitoring Real Time SOL and IROL Exceedances	Provides established procedures to ensure that a Real-Time Assessment is performed at least once every 30 minutes for monitoring BES Facilities, which may include sub-transmission information, within its RC area and adjacent RC areas, as necessary to ensure that, regardless of prior planned or unplanned events, the B.C. RC is able to determine any potential SOL and IROL violations within its RC area.	B.C. (RC, TOP, BA)  RCs in the Western Interconnection
Monitoring System Frequency and BA Performance	Provides guidance to ensure the RC monitors: <ol style="list-style-type: none"> <li>System frequency and identifies sources of large Area Control Error that may be contributing to Frequency Trigger Limit exceedances, SOL exceedance, and excessive Inadvertent Interchange.</li> <li>Contingency Reserves to ensure that BA and Reserve Sharing Group reserve requirements are being met.</li> </ol>	B.C. (RC, TOP, BA)  RCs in the Western Interconnection
Time Error Correction	Provides guidance to the RC upon initiation of Manual Time Error Correction in a manner that does not adversely affect the reliability of the Interconnection.	B.C. (RC, BA)  RCs in the Western Interconnection

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 4 of 5
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

<b>Operational Documents</b>	<b>Purpose</b>	<b>Impacted Entities</b>
<b>Emergency Operations Procedure</b>	Establishes criteria to be followed in the event of an Extraordinary Contingency that results in an operating emergency involving off-nominal frequency, IROL/SOL exceedance, capacity or energy deficiency, unacceptable voltage levels, or any other emergency that the RC deems appropriate within the RC area.	<b>B.C. (RC,TOP,BA)</b>  RCs in the Western Interconnection
<b>Capacity and Energy Emergencies</b>	Defines the roles and responsibilities of the B.C. RC during Capacity and Energy Emergencies.	<b>B.C. (RC,TOP,BA)</b>  RCs in the Western Interconnection
<b>EOP-011 BA and TOP Emergency Plans Worksheet Instructions</b>	Facilitates the RC's coordinated review of TOP and BA Operating Plan(s) to mitigate operating Emergencies as required by Reliability Standard EOP-011-1. This worksheet identifies the elements that are within the scope of the review and specifies the criteria for the assessment.	<b>B.C. (RC,BA,TOP)</b>
<b>EOP-011 Emergency Operations Review</b>	Documents the internal process by which the B.C. RC reviews the EOP-011 Emergency Operations Plans of the applicable BA and TOP within B.C. RC's area.	<b>B.C. (RC,BA,TOP)</b>
<b>Restoration Plan</b>	Prepares RC and TOPs to enable effective coordination of the system restoration process to ensure reliability is maintained during restoration and priority is placed on restoring the interconnection.	<b>B.C. (RC,BA,TOP)</b>  RCs in the Western Interconnection
<b>RC Transmission Operator System Restoration Plan Worksheet</b>	This worksheet identifies the elements that are within the scope of restoration plans.	<b>B.C. (RC,TOP)</b>
<b>GMD Operating Plan</b>	<ul style="list-style-type: none"> <li>• Defines the manner in which the Geomagnetic Disturbance (GMD) space weather notifications are disseminated;</li> <li>• Facilitates the coordination of TOP GMD Operating Procedures or Operating Processes; and</li> <li>• Describes activities designed to mitigate the effects of GMD events on the reliable operation of the interconnected transmission system within the B.C. RC area.</li> </ul>	<b>B.C. (RC,TOP)</b>  RCs in the Western Interconnection

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 5 of 5
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

<b>Operational Documents</b>	<b>Purpose</b>	<b>Impacted Entities</b>
<b>EOP-010 GMD Review</b>	Documents the internal process by which the B.C. RC reviews the GMD Operating Procedures or Operating Processes of the applicable TOP within the B.C. RC area.	B.C. (RC, TOP)
<b>Event Notification and Reporting Operating Plan</b>	Provides the B.C. RC with an Event Notification and Reporting Operating Plan to be followed upon occurrence of a reportable BES disturbance or unusual occurrence in accordance with Reliability Standard requirements.	B.C. (RC, BA, TO, TOP, GO, GOP, DP)  RCs in the Western Interconnection
<b>Loss of Control Center Functionality</b>	Ensures a plan is in place to continue monitoring the reliable operation of the BES in the event of the B.C. RC's primary control center becomes inoperable.	B.C. (RC, TOP, BA)  RCs in the Western Interconnection
<b>1T-21 Operating Personnel Communication Protocol</b>	Demonstrates compliance with Reliability Standard COM-002-4 by documenting communication protocols for Operating Personnel that issue or receive Operating Instructions.	B.C. (RC, BA, TOP, GOP, DP)  RCs in the Western Interconnection

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 11.0 Operational Issues

### Reference: Operational Documents

1.11.1 Please provide a listing of all existing and new operational documents required for BC Hydro to assume the RC role.

1.11.1.1 For each of the documents, please explain the purpose of the document, its current status, and the process and timeline to completion.

### RESPONSE:

Please refer to BC Hydro's response to FBC IR 1.11.1.



<b>FortisBC Inc.</b> Information Request No. <b>1.11.1.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 11.0 Operational Issues

### Reference: Operational Documents

- 1.11.1 Please provide a listing of all existing and new operational documents required for BC Hydro to assume the RC role.
- 1.11.1.2 Please describe the process for future modification of the operational documents.

### RESPONSE:

**Operational documents will have a review cycle determined primarily by any associated requirements within the Reliability Standards. This will be defined within the body of each document. All suggestions for revision will be directed to the approver or designated subject matter expert identified within the document.**

**Revisions to operational documents that have impacts beyond BC Hydro will normally be subjected to a 30-day review period before any revision is accepted for approval. This provides the B.C. registered entities with an opportunity to review and comment prior to the changes coming into effect.**

<b>FortisBC Inc.</b> Information Request No. <b>1.11.1.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 11.0 Operational Issues

### Reference: Operational Documents

- 1.11.1 Please provide a listing of all existing and new operational documents required for BC Hydro to assume the RC role.
- 1.11.1.3 Please describe the process used by PEAK, which includes input by affected registered entities, and identify and explain any differences in BC Hydro's proposed process.

### RESPONSE:

PEAK has a “Compliance Impact Stakeholder Engagement Plan” to document PEAK processes to assess and identify compliance impacts resulting from the development or revision of PEAK documentation. This plan also defines PEAK’s stakeholder engagement approach for creating awareness for, or collaborating with, stakeholders when development or revision of PEAK documentation may lead to compliance impacts for PEAK stakeholders.

The plan indicates that the appropriate level of stakeholder engagement is determined by the Director of Compliance and is based on the degree and complexity of compliance impact(s) to stakeholders.

PEAK encourages stakeholders to provide input during the development or revision of documentation that is identified as impacting stakeholder compliance. Stakeholder input will normally be captured through open comment periods prior to document implementation.

PEAK reserves the right to implement documentation in an expedited manner in order to ensure facilitation of PEAK compliance. If expedited implementation occurs without a previous comment period, PEAK will provide a post-implementation comment period to capture and consider stakeholder input which may result in future document revision(s).

The B.C. RC will have a similar process for future modifications of operational documents as described in BC Hydro’s response to FBC IR 1.11.1.2.

<b>FortisBC Inc.</b> Information Request No. <b>1.12.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 12.0 Operational Issues

**Reference: Software Tools  
Exhibit B-1, Section 4.2.5, pages 4-6 to 4-7**

BC Hydro identifies the following tools or applications that require modifications and enhancements:

1. Wide Area Visualization tool;
2. Network Model;
3. Outage Management Software; and
4. Shared Services/Externally Hosted Applications.

1.12.1 Which, if any, of these applications will require interface or information exchange with registered entities?

### **RESPONSE:**

**All of the applications identified in section 4.2.5 of the Application require some level of interface and/or information exchange with B.C. registered entities or entities outside of B.C. (other BAs, TOPs and RCs located in the Western Interconnection).**

**To the extent possible, BC Hydro intends to utilize existing information transfer methods to support the interface and information exchange requirements of the software tools being developed or enhanced. BC Hydro has assessed the information requirements for the development or modification of these tools as follows:**

- 1. Wide Area Visualization Tool: BC Hydro plans to use the existing information provided by registered entities and other entities located within the Western Interconnection. Any additional information required will be identified during the development to take place between January and March 2019 and will be included in BC Hydro's RC data specification.**
- 2. Network Model: BC Hydro has obtained the majority of the information required for network modeling from registered entities or from other entities within the Western Interconnection. Going forward, the network modeling requirements will be identified in BC Hydro's RC data specification.**
- 3. Outage Management Software: BC Hydro will be using the existing information provided by the registered entities of B.C. as well as additional information to be provided by PEAK, AESO, CAISO and SPP.**
- 4. Shared Services/Externally Hosted Applications: BC Hydro does not anticipate requiring any new data interfaces or information exchange requirements for these applications. It is expected that these applications will**

<b>FortisBC Inc.</b> Information Request No. <b>1.12.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 2 of 2
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

use existing data or use new data sourced from prospective RCs such as CAISO.

BC Hydro plans to include all requirements for information exchange in the B.C. Reliability Data specification that is required in conjunction with Reliability Standard IRO-010-2 which will be effective in B.C. on April 1, 2019. As discussed in BC Hydro's response to FBC IR 1.11.1, the data specification, once drafted, will be shared with the B.C. registered entities for a review cycle to take place before the end of March 31, 2019. The potential for modifications causing B.C. registered entities to become non-compliant with any relevant Reliability Standards is low given BC Hydro will be working closely with registered entities to incorporate these minor modifications.

<b>FortisBC Inc.</b> Information Request No. <b>1.12.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 12.0 Operational Issues

**Reference: Software Tools  
Exhibit B-1, Section 4.2.5, pages 4-6 to 4-7**

BC Hydro identifies the following tools or applications that require modifications and enhancements:

1. **Wide Area Visualization tool;**
2. **Network Model;**
3. **Outage Management Software; and**
4. **Shared Services/Externally Hosted Applications.**

1.12.1 Which, if any, of these applications will require interface or information exchange with registered entities?

1.12.1.1 For those applications, please confirm whether existing information transfer method will be used, or modifications required.

### **RESPONSE:**

**Please refer to BC Hydro's response to FBC IR 1.12.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.12.1.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 12.0 Operational Issues

**Reference: Software Tools  
Exhibit B-1, Section 4.2.5, pages 4-6 to 4-7**

BC Hydro identifies the following tools or applications that require modifications and enhancements:

1. **Wide Area Visualization tool;**
2. **Network Model;**
3. **Outage Management Software; and**
4. **Shared Services/Externally Hosted Applications.**

1.12.1 Which, if any, of these applications will require interface or information exchange with registered entities?

1.12.1.1 For those applications, please confirm whether existing information transfer method will be used, or modifications required.

1.12.1.1.1 If modifications are required, when will BC Hydro communicate the requirements to registered entities? Please comment on the potential for such modifications to cause registered entities to become non-compliant with any relevant standards or requirements.

### **RESPONSE:**

**Please refer to BC Hydro's response to FBC IR 1.12.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.13.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

### 13.0 Operational Issues

**Reference: RC Standards and Tasks  
Exhibit B-1, Section 2.3.2, pages 2-6 to 2-8**

BC Hydro identifies a number of RC activities and Ahead of Time Tasks and Real Time Tasks associated with other RCs, TOPs, GOPs, and BAs on pages 2-6 to 2-8.

BC entities currently have process and procedures with the existing RC and are compliant with PEAK's methodologies and requirements for the performance of these tasks.

1.13.1 Which, if any, of these processes and procedures will require modification if BC Hydro becomes the RC?

#### **RESPONSE:**

**PEAK's current processes and procedures are consistent with Reliability Standards in effect in B.C. The requirements associated with these processes and procedures will not change when BC Hydro becomes the RC. BC Hydro is drafting processes and procedures that will replace those currently in effect with PEAK. There are modifications required to all processes and procedures to reflect BC Hydro providing the RC service.**

<b>FortisBC Inc.</b> Information Request No. <b>1.13.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

### 13.0 Operational Issues

**Reference: RC Standards and Tasks  
 Exhibit B-1, Section 2.3.2, pages 2-6 to 2-8**

BC Hydro identifies a number of RC activities and Ahead of Time Tasks and Real Time Tasks associated with other RCs, TOPs, GOPs, and BAs on pages 2-6 to 2-8.

BC entities currently have process and procedures with the existing RC and are compliant with PEAK's methodologies and requirements for the performance of these tasks.

1.13.1 Which, if any, of these processes and procedures will require modification if BC Hydro becomes the RC?

1.13.1.1 If modifications are required, when will BC Hydro communicate the requirements to registered entities? Please comment on the potential for such modifications to cause registered entities to become non-compliant with any relevant standards or requirements.

**RESPONSE:**

**BC Hydro intends to share the modified processes and procedures with the B.C. registered entities as indicated in response to FBC IR 1.11.1.**

**Registered entities will need to transition to complying with the BC Hydro RC processes and procedures in conjunction with the proposed September 2, 2019 go-live date to support compliance. BC Hydro will be working closely with B.C. registered entities to support this transition.**

**BC Hydro expects the transition from PEAK's procedures to the BC Hydro RC procedures to be discussed once the RC Registered Entities Oversight Group is established so that all entities have clarity in the expectations to ensure compliance is maintained through the transition to BC Hydro performing the RC function.**

**The potential for modifications to processes and procedures causing B.C. registered entities to become non-compliant with any relevant Reliability Standards is low given BC Hydro will be working closely with registered entities in adopting modifications.**



<b>FortisBC Inc.</b> Information Request No. <b>1.14.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

## 14.0 Operational Issues

### Reference: RC Services to Registered Entities

In addition to the non-core services listed in BCUC IR 1.14.1, PEAK also provides frequent hosted on-line restoration drills (for NERC recognized training hours).

1.14.1 With what frequency does BC Hydro intend to provide this training?

### RESPONSE:

**Requirements(R) 10 and 10.1 of Emergency Operations Reliability Standard EOP-006-2 are listed below:**

**“R10. Each Reliability Coordinator shall conduct two System restoration drills, exercises, or simulations per calendar year, which shall include the Transmission Operators and Generator Operators as dictated by the particular scope of the drill, exercise, or simulation that is being conducted.**

**R10.1. Each Reliability Coordinator shall request each Transmission Operator identified in its restoration plan and each Generator Operator identified in the Transmission Operators’ restoration plans to participate in a drill, exercise, or simulation at least every two calendar years.”**

**In order to accommodate the staffing schedules of BC Hydro and registered entities identified in R10 and R10.1, BC Hydro will deliver at least three restoration drills per year. The courses will be instructor led, classroom training sessions delivered at BC Hydro’s Fraser Valley Office in Langley, B.C. These courses will be registered under the NERC Continuing Education Program and will award Continuing Education Hours.**

**FortisBC and other B.C. registered entities identified in R10 and R10.1 are welcome to register and attend these sessions as needed to meet their compliance and training requirements.**

<b>FortisBC Inc.</b> Information Request No. <b>1.14.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

#### **14.0 Operational Issues**

##### **Reference: RC Services to Registered Entities**

In addition to the non-core services listed in BCUC IR 1.14.1, PEAK also provides frequent hosted on-line restoration drills (for NERC recognized training hours).

1.14.2 Does BC Hydro intend this training to be provided in an on-line format?

##### **RESPONSE:**

**No. Please refer to BC Hydro's response to FBC IR 1.14.1.**

<b>FortisBC Inc.</b> Information Request No. <b>1.14.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 14.0 Operational Issues

### Reference: RC Services to Registered Entities

In addition to the non-core services listed in BCUC IR 1.14.1, PEAK also provides frequent hosted on-line restoration drills (for NERC recognized training hours).

- 1.14.3 If the frequency or format of the training differs from PEAK's, has BC Hydro evaluated the incremental cost to registered entities?

### RESPONSE:

**The frequency of the training will be different from that provided by PEAK. PEAK had many more TOPs and GOPs within its footprint and therefore had to offer more frequent training sessions. BC Hydro has not evaluated the incremental cost to B.C. registered entities to attend in-person training sessions at its control center rather than online, but believes there will be an incremental benefit to in person training over online training.**

<b>FortisBC Inc.</b> Information Request No. <b>1.15.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 15.0 Operational Issues

**Reference: Start-Up and Annual Costs  
Exhibit B-1, Table 3-1, page 3-4 and page 4-12, lines 13-15**

**Table 3-1 Evaluation of Alternatives 1 and 2**

Alternative	Reliability Benefit	Governance Risk	Implementation Risk	Start-up Cost (\$million CAN)	Annual Cost (\$million CAN)
BC Hydro	High	Low	Medium	1.77 <sup>8</sup> – 2.30	2.51 <sup>8</sup> – 2.76
CAISO	Medium	Medium	Low	0.25 – 0.50	1.60 – 4.70

BC Hydro identifies the range of start-up and ongoing costs for each of the alternatives. As RC, BC Hydro will be tasked with developing and completing processes related to day-ahead and real-time assessments for the B.C. footprint. At this stage we anticipate these processes to be similar to the PEAK operating processes

1.15.1 Please confirm that the range of costs identified in Table 3-1 are BC Hydro costs only.

### RESPONSE:

**BC Hydro can confirm that the costs included in the range of costs in Table 3-1 are costs that will be borne by BC Hydro only.**

<b>FortisBC Inc.</b> Information Request No. <b>1.15.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 15.0 Operational Issues

**Reference: Start-Up and Annual Costs  
Exhibit B-1, Table 3-1, page 3-4 and page 4-12, lines 13-15**

Table 3-1 Evaluation of Alternatives 1 and 2

Alternative	Reliability Benefit	Governance Risk	Implementation Risk	Start-up Cost (\$million CAN)	Annual Cost (\$million CAN)
BC Hydro	High	Low	Medium	1.77 <sup>B</sup> – 2.30	2.51 <sup>B</sup> – 2.76
CAISO	Medium	Medium	Low	0.25 – 0.50	1.60 – 4.70

BC Hydro identifies the range of start-up and ongoing costs for each of the alternatives. As RC, BC Hydro will be tasked with developing and completing processes related to day-ahead and real-time assessments for the B.C. footprint. At this stage we anticipate these processes to be similar to the PEAK operating processes

1.15.1 Please confirm that the range of costs identified in Table 3-1 are BC Hydro costs only.

1.15.1.1 Please comment on whether a more appropriate cost analysis for the RC transition would be on a province-wide basis, that is, by including the costs to registered entities associated with the change in RC.

### RESPONSE:

**BC Hydro has historically borne the costs of procuring these RC services on behalf of all B.C. registered entities. Moving forward BC Hydro proposes to continue bearing those costs. Meanwhile all B.C. registered entities, indeed all B.C. electricity customers, have received the reliability benefits of the MRS program.**

**As RC-related Reliability Standards in the province have been adopted, all registered entities have had the opportunity to comment on incremental costs associated with the requirements of those Reliability Standards.**

**BC Hydro does not intend to impose undue or unnecessary process on B.C. registered entities that would lead to anything other than minor costs associated with preparation of agreements, documentation of data sharing and outage coordination procedures, coordination of emergency plans and joint training activities.**

**The anticipated modest incremental costs that B.C. registered entities may bear in consequence of the dissolution of PEAK have no bearing on BC Hydro's application to be registered as RC for B.C.**

<b>FortisBC Inc.</b> Information Request No. <b>1.15.1.1.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

## 15.0 Operational Issues

**Reference: Start-Up and Annual Costs  
Exhibit B-1, Table 3-1, page 3-4 and page 4-12, lines 13-15**

Table 3-1 Evaluation of Alternatives 1 and 2

Alternative	Reliability Benefit	Governance Risk	Implementation Risk	Start-up Cost (\$million CAN)	Annual Cost (\$million CAN)
BC Hydro	High	Low	Medium	1.77 <sup>8</sup> – 2.30	2.51 <sup>8</sup> – 2.76
CAISO	Medium	Medium	Low	0.25 – 0.50	1.60 – 4.70

BC Hydro identifies the range of start-up and ongoing costs for each of the alternatives. As RC, BC Hydro will be tasked with developing and completing processes related to day-ahead and real-time assessments for the B.C. footprint. At this stage we anticipate these processes to be similar to the PEAK operating processes

- 1.15.1 Please confirm that the range of costs identified in Table 3-1 are BC Hydro costs only.
  - 1.15.1.1 Please comment on whether a more appropriate cost analysis for the RC transition would be on a province-wide basis, that is, by including the costs to registered entities associated with the change in RC.
    - 1.15.1.1.1 Has BC Hydro made any effort to identify incremental costs to registered entities from a transition to either BC Hydro or CAISO as the RC?

### RESPONSE:

**BC Hydro has not quantified any incremental costs to B.C. registered entities due to the dissolution of PEAK and the need for a new RC. Such costs would likely be similar regardless of who the RC provider would be.**

**BC Hydro sought feedback from B.C. registered entities on any questions they might have about the current state of RC services or the expected state through transition to a new RC. As noted in BC Hydro's response to BCUC IR 1.9.6, FortisBC expressed concern regarding increased costs for restoration training as PEAK training is provided remotely and they can attend and receive continuing education hours without incurring travel costs.**

**The anticipated modest incremental costs that B.C. registered entities may bear in consequence of the dissolution of PEAK have no bearing on BC Hydro's application to be registered as RC for B.C.**

FortisBC Inc. Information Request No. 1.16.1 Dated: January 7, 2019 British Columbia Hydro & Power Authority Response issued January 23, 2019	Page 1 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with the Mandatory Reliability Standards Program</b>	<b>Exhibit: B-6</b>

## 16.0 Adoption of MRS Standards

**Reference: Effective Dates of Standards in US vs. BC  
Transcript Volume 1, page 25, lines 10 – 23**

10 and I think we can ensure that we're able to meet the  
11 effective standard within B.C. also while meeting the  
12 existing standards that's applicable to the U.S.  
13 entities. So our analysis to date shows that the  
14 differences are not that significant.  
15 MS. BIENERT: Okay, can I ask one follow-up question  
16 then to that? Does BC Hydro see any value or consider  
17 the option of accelerating adoption of any of those  
18 standards at this point in time?  
19 MR. STEED: At this time I can't provide a fulsome  
20 answer. I would say it's definitely been something  
21 we've been considering, and as we develop the  
22 processes, I would say yes, we should look at that  
23 potential.

1.16.1 Are any of the standards that are the subject of this discussion applicable to functions other than the RC?

### RESPONSE:

The Reliability Standards that are the subject of this discussion are those Reliability Standards that are applicable to the RC function and have not been adopted in B.C., but are adopted in the U.S. BC Hydro's response to this IR expands the scope of the Reliability Standards to also include those that have been assessed and adopted in B.C. but with future effective dates. Please refer to the table below for a list of these Reliability Standards.

Standards Not Adopted in B.C. or Adopted but Not Yet Effective in B.C.	Effective Date in B.C.	Functions to which the Standard is Applicable
CIP-003-7	Will be assessed for potential BC adoption in Assessment Report 12	RC, BA, DP, GOP, GO, IC/IA, TOP, TO
CIP-005-6	Will be assessed for potential BC adoption in Assessment Report 13	RC, BA, DP, GOP, GO, IC/IA, TOP, TO

<b>FortisBC Inc.</b> Information Request No. <b>1.16.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 2 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

<b>Standards Not Adopted in B.C. or Adopted but Not Yet Effective in B.C.</b>	<b>Effective Date in B.C.</b>	<b>Functions to which the Standard is Applicable</b>
CIP-010-3	Will be assessed for potential BC adoption in Assessment Report 13	RC, BA, DP, GOP, GO, IC/IA, TOP, TO
CIP-013-1	Will be assessed for potential BC adoption in Assessment Report 13	RC, BA, DP, GOP, GO, IC/IA, TOP, TO
EOP-004-4	Will be assessed for potential BC adoption in Assessment Report 12	RC, BA, TO, TOP, GO, GOP, DP
EOP-006-3	Will be assessed for potential BC adoption in Assessment Report 12	RC
EOP-008-2	Will be assessed for potential BC adoption in Assessment Report 12	RC, TOP, BA
IRO-010-2	April 1, 2019 (Assessment Report 10)	RC, BA, GO, GOP, TOP, TO, DP
IRO-017-1	October 1, 2020 (Assessment Report 10)	RC, TOP, BA, PC, TP
IRO-018-1(i)	April 1, 2020 (Assessment Report 11)	RC
MOD-033-1	Held in abeyance in B.C. due to the undefined PA/PC footprints and entities responsible (Assessment Report 8)	RC, PA/PC, TOP
PRC-002-2	R1, R5 – Effective April 1, 2017 R2 to R4, R6 to R11 – Effective 50% by April 1, 2021; 100% by April 1, 2023 Entities that only own one identified BES bus, BES Element, or generating unit – Effective 100% by April 1, 2023. R12 – Effective July 1, 2017 (Assessment Report 9)	RC, TO, GO



<b>FortisBC Inc.</b> Information Request No. <b>1.16.1</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 3 of 3
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with          the Mandatory Reliability Standards Program</b>	<b>Exhibit:          B-6</b>

Standards Not Adopted in B.C. or Adopted but Not Yet Effective in B.C.	Effective Date in B.C.	Functions to which the Standard is Applicable
PRC-012-2	October 1, 2021 with the following exceptions: R1, R2, R4 – Attachment 1, Section II Parts 6d) and 6e) as referenced from R1, Attachment 2 Section I Parts 7d) and 7e) as referenced from R2, and all of R4 are held in abeyance due to unresolved PA/PC role dependencies. R8 – Effective October 1, 2027 for each RAS not designated as limited impact, and effective October 1, 2033 for each RAS designated as limited impact. (Assessment Report 11)	RC, PC, TO, GO, DP

<b>FortisBC Inc.</b> Information Request No. <b>1.16.2</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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**Reference: Effective Dates of Standards in US vs. BC  
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20 answer. I would say it's definitely been something  
21 we've been considering, and as we develop the  
22 processes, I would say yes, we should look at that  
23 potential.

1.16.2 Please comment on the possibility that standards or versions of standards effective in BC could conflict with standards or versions of standards applicable in the US and how such conflicts, if they exist, could be resolved.

### RESPONSE:

The Reliability Standards effective in B.C. are not necessarily aligned with the Reliability Standards applicable in the U.S. due to the different B.C. assessment and adoption process timelines in relation to the U.S. adoption process. This can result in differences between the Reliability Standards adopted in B.C. and those adopted in the U.S. however this does not necessarily mean there are risks of adverse reliability impacts.

Where there are risks of adverse reliability impacts identified by either BC Hydro or other registered entities during the assessment of Reliability Standards, BC Hydro can recommend an accelerated adoption and recommend that their effective dates align more closely or are in step with U.S. effective dates. BC Hydro has done this in the past regarding revisions to select BAL domain Reliability Standards (i.e., BAL-001-2 in 2016). If reliability needs dictate, it is also possible to initiate an expedited assessment report process in B.C. separate from the usual process timeline.

<b>FortisBC Inc.</b> Information Request No. <b>1.16.3</b> Dated: <b>January 7, 2019</b> British Columbia Hydro & Power Authority Response issued <b>January 23, 2019</b>	Page 1 of 1
British Columbia Hydro & Power Authority <b>Application for Reliability Coordinator Registration with  the Mandatory Reliability Standards Program</b>	<b>Exhibit:  B-6</b>

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20 answer. I would say it's definitely been something  
21 we've been considering, and as we develop the  
22 processes, I would say yes, we should look at that  
23 potential.

1.16.3 Please describe the process by which an acceleration of  
standards would occur.

### RESPONSE:

**Please refer to BC Hydro's response to FBC IR 1.16.2.**