Chris Sandve
Chief Regulatory Officer
Phone: 604-623-4381
Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

June 25, 2021

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: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Mandatory Reliability Standards (MRS)
Planning Coordinator Assessment Report (Report) – Implementation Approach

As contemplated in the cover letter to the Report filed by BC Hydro with the BCUC on May 31, 2021, BC Hydro is writing to the BCUC to provide further information regarding its anticipated timing for:

- Registering as the Planning Coordinator (**PC**); and
- Engaging other entities interconnected to the BC Hydro system that are registered in the B.C. MRS program on the potential for BC Hydro to provide PC service to those entities.

In summary, BC Hydro plans to phase in the implementation of its PC function as follows:

- **Phase 1 – PC Registration and Implementation of the PC Function for BC Hydro Bulk Electric System Assets:** BC Hydro will initially register to be PC for BC Hydro owned bulk electric system (**BES**) assets only. BC Hydro currently anticipates submitting its PC registration with the Western Electricity Coordinating Council **(WECC**) on or before February 1, 2022. During Phase 1, following its registration as PC, BC Hydro will continue to evolve its program to ensure compliance with PC standards that come into effect;
- **Phase 2 – Expansion of PC Services to Interconnected Entities:** In the second phase, BC Hydro will engage with the Independent Power Producers (**IPPs**) and Transmission Voltage Customers (**TVCs**) that are interconnected to BC Hydro's BES system and are also registered for specific relevant MRS functions, such as Generator Owner (**GO**) and Distribution Provider (**DP**) (collectively, the **Interconnected Entities**). Through this engagement, BC Hydro will offer to provide

PC services to the Interconnected Entities. BC Hydro expects to commence these engagement activities with the Interconnected Entities approximately 24 months following its PC registration with WECC. This phase does not include unrelated Transmission Planners (**TP**), namely FortisBC Inc. (**FortisBC**); and

- **Phase 3 – Consider Expansion of PC Services to FortisBC as Transmission Planner:** Once BC Hydro has offered and/or is providing PC services to the Interconnected Entities under Phase 2, BC Hydro will consider expanding its PC services to other TPs in British Columbia, namely FortisBC.

In BC Hydro's view, implementing the PC function in phases is a reasonable, prudent approach that is supported by the recommendations to the Western Electricity Coordinating Council (**WECC**) in the final white paper produced by the Planning Coordinator Function Task Force.[1] BC Hydro has retained Guidehouse Inc. (**Guidehouse**), who has significant MRS expertise, to assist with the development of this phased implementation approach. Guidehouse has provided a letter with regard to BC Hydro's approach, which is included as Attachment 1.

BC Hydro's phased implementation plan reflects reasonable timelines that support the successful implementation, performance, and compliance of BC Hydro's PC function in B.C. It enables the PC function to be adopted in B.C. in the short-term, is aligned with the approach of other entities in the WECC region and will enhance system reliability through each of the phases.

Further detail on each phase of BC Hydro's approach is provided below.

Phase 1 - Planning Coordinator Registration and Implementation of the PC Function for BC Hydro BES Assets

In Phase 1, BC Hydro's primary focus is on the performance of the PC function by BC Hydro for its BES assets. As such, Phase 1 activities include preparation by BC Hydro for its PC functional registration, registration by BC Hydro with WECC for the PC function and the implementation of the PC role within BC Hydro.

Preparation for PC Function

Before BC Hydro can register and begin performing the PC function, there are a number of actions that need to be taken so that BC Hydro can receive information as the PC, perform the PC work and provide information to others. This will include ensuring readiness for compliance with PC-related standards already in effect, forming a Planning Coordinator Office by assigning or hiring staff with specific technical expertise, engaging

[1] Methodology for Defining Planning Coordinator Areas in the WECC Region. Planning Coordinator Function Task Force (**PCFTF**). September 14, 2015. https://www.wecc.org/Reliability/PCFTF%20White%20Paper_final_9-14-15.pdf.

with relevant stakeholders, developing scalable tools and processes and establishing a governance framework.

Timing for Registration

BC Hydro currently anticipates submitting its registration with WECC on or before February 1, 2022. BC Hydro will register to be the PC for BC Hydro's BES assets only.

BC Hydro is currently registered for and performing the obligations associated with the Planning Authority (**PA**) function for its own BES assets. When BC Hydro registers for the PC function, it will require BC Hydro to be compliant with those standards currently in effect in B.C. that include requirements for PCs. BC Hydro expects to align its anticipated date for compliance with its registration date as a PC in accordance with Section 1 of the Registration Manual. BC Hydro believes a registration date on or before February 1, 2022 is both reasonable and achievable, considering the preparation activities outlined above and the need to ensure compliance with those standards already in effect.

Standards Applicable on Registration

Upon registration, BC Hydro will need to ensure compliance with standards and requirements that are already in effect and also prepare for compliance with standards that have recently been assessed or adopted and are expected to be effective in the near term.

The below PC-related standards and requirements are currently in effect in B.C. BC Hydro will need to establish its PC function and complete any necessary actions to implement these standards and requirements and to demonstrate compliance, prior to registering as PC. The following standards and requirements refer to the PC function and are currently adopted and effective in B.C.:

Table 1 Standards and Requirements Referring to PC function currently Adopted and Effective in B.C.

Standard	Title	PC-Related Requirements
CIP-002-5.1a	Cyber Security – BES Cyber System Categorization	R1
CIP-014-2	Physical Security	R2
FAC-002-2	Facility Interconnection Studies	R1 - R5 (entire standard)
FAC-008-3	Facility Ratings	R7, R8
IRO-017-1	Outage Coordination	R3, R4

Standard	Title	PC-Related Requirements
MOD-001-1a	Available Transmission System Capability	R4, R5, R9
MOD-004-1	Capacity Benefit Margin	R2, R9
MOD-008-1	Transmission Reliability Margin Calculation Methodology	R3
MOD-031-2[2]	Demand and Energy Data	R1 - R4 (entire standard)
NUC-001-3[3]	Nuclear Plan Interface Coordination	R1 – R9 (entire standard)
PRC-023-4	Transmission Relay Loadability	R3, R4
PRC-024-2	Generation Frequency and Voltage Protective Relay Settings	R3, R4
TPL-001-4	Transmission System Planning Performance Requirements	R1, R2, R3, R4, R5, R6, R8[4]

Once BC Hydro is registered as a PC, BC Hydro will continue to evolve its program to ensure compliance with PC standards that come into effect, including those standards and requirements assessed in the recently filed Assessment Report 14 and the Report.[5]

This Approach Will Enhance Reliability

When BC Hydro registers as a PC, a majority of the BES assets in the province will be under a PC footprint.

In BC Hydro's view, bringing the PC function into effect in B.C. in alignment with the rest of the WECC region and in alignment with other North American Electric Reliability Coproation (**NERC**) regions, will be a significant advancement of the PC function in B.C.

While BC Hydro already performs a number of planning activities in accordance with good utility practice and its role as a WECC Area Coordinator, there will be improvements in system reliability when BC Hydro is the PC for its own BES assets because a number of PC-related standards require actions by the PC that are not

2 Standard refers to both PC and PA functions.

3 Not relevant to BC Hydro as BC Hydro has no nuclear BES assets and there are no nuclear BES assets in B.C.

4 BC Hydro is complying with these requirements in relation to its existing MRS functions. However, the PC related aspects of these requirements are dependent upon the BCUC's adoption of TPL-001-4 R7 which was assessed in the Report.

5 For planning purposes, BC Hydro is assuming that the implementation schedule for the MRS assessed in these reports is consistent with the implementation schedules that have been proposed.

currently being performed in B.C. For example, as PC, BC Hydro will be required to undertake steady state and dynamic load model validation (MOD-033-2) and ensure appropriate planned system performance for geomagnetic disturbance events (TPL-007–4).

The scope of work in Phase 1 includes BC Hydro establishing the PC function, developing its in-house expertise with the specific standards and requirements, conducting the required new types of studies and developing mitigating measures if required, coordinating with other MRS functions, developing processes and procedures, establishing appropriate governance structures and assurance processes, training employees, and conducting appropriate change management. BC Hydro intends to undertake these efforts with a view to expanding and scaling BC Hydro's PC function for Phases 2 and 3.

Phase 2 – Expansion of PC Services to Interconnected Entities

In Phase 2, BC Hydro will offer to provide PC services to the Interconnected Entities which will further expand the PC footprint, if agreements are reached. The expansion of BC Hydro's PC function will further improve system reliability.

The initial Phase 1 focus on implementation of the PC function for BC Hydro's BES assets will allow BC Hydro to develop a strong and effective PC program before BC Hydro begins offering PC services to the Interconnected Entities in Phase 2. BC Hydro anticipates commencing Phase 2 approximately 24 months after it registers as PC.

Before BC Hydro can provide PC services to the Interconnected Entities, negotiations and discussions are required so that the necessary arrangements are in place.

In accordance with good utility practice and as an Area Coordinator for WECC, BC Hydro already performs certain studies of its system that include the Interconnected Entities, as these IPPs and TVCs are already connected to BC Hydro's BES system. BC Hydro currently relies on existing interconnection agreements to gather the information needed to support these studies and will continue to perform these studies in Phase 1.

BC Hydro anticipates that additional agreements or revisions to existing agreements will be required as part of Phase 2 in order to provide PC services. As new IPP and TVC entities connect to BC Hydro's BES system and register in the MRS program, additional negotiations and agreements will be required on an ongoing basis.

BC Hydro currently expects to focus on the following activities in Phase 2:

- Consideration of the PC-related standards and requirements, including impacts on different Interconnected Entities depending on their MRS registration;

- Development of processes and procedures for interactions with Interconnected Entities, including information gathering and sharing and the provision of compliance evidence, if required;
- Development of proposed implementation schedules for PC-related standards and requirements for including Interconnected Entities;
- Development of governance processes to provide transparency, fairness and independence as a PC in dealing with BC Hydro and its other MRS functions and with Interconnected Entities and their MRS functions;
- Dispute resolution processes, including processes to address issues associated with the PC function, standards and requirements and changes to the standards and requirements;
- Development of any required committees or working groups, such as inter-area planning committees;
- Mitigation of compliance risk due to the actions of each entity;
- Negotiation and execution of joint operating or seams issues agreements; and
- Development of service agreements as well as other commercial terms related to BC Hydro providing PC services.

While some of BC Hydro's Phase 1 work will progress its understanding on a number of these issues, the majority of the Phase 2 timeline will be determined by the discussions and negotiations with each of the Interconnected Entities. A number of the issues identified above will need to be addressed with the Interconnected Entities as a group to ensure consistency in treatment (e.g., committees, governance and dispute resolution).

BC Hydro expects to commence the provision of PC services to Interconnected Entities on a periodic basis, likely annually, so that the commencement dates align with BC Hydro's business cycle and processes. This will enable the efficient addition of new Interconnected Entities in studies, assessments, compliance evidence and other PC related work.

As new IPP and TVC entities connect to BC Hydro's BES system, additional negotiations and agreements will be required on an ongoing basis and will be incorporated into the PC function's activities on a periodic basis (likely annually).

Phase 3 – Consider Expansion of PC Services to FortisBC

BC Hydro's experience in providing PC services to the Interconnected Entities in Phase 2 will inform its consideration of expanding its PC services to unrelated TPs, namely FortisBC. BC Hydro's experience in Phase 2 will also provide valuable information on the reliability benefits, feasibility and costs associated with the expansion of BC Hydro's PC function.

BC Hydro will provide regular updates to the BCUC as it establishes its PC function and progresses its PC plan.

For further information, please contact Alicia Henderson at 604-623-4381 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Chris Sandve
Chief Regulatory Officer

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Enclosure

Guidehouse Inc.
100 King Street West
Suite No. 4950
Toronto, ON M5X 1B1
416.777.2440
guidehouse.com

Mr. Ajay Kumar
VP Asset Planning
333 Dunsmuir Street
Vancouver BC 46B5R3

June 24, 2021

RE: BC Hydro Transition to Planning Coordinator

Mr. Kumar:

BC Hydro has requested Guidehouse, Inc. (Guidehouse) to assess its approach to transition to a North American Electric Reliability Corp. (NERC) registered Planning Coordinator (PC) within the Western Electric Coordinating Council (WECC) and provide an opinion regarding this proposed approach.

It is Guidehouse's understanding that BC Hydro plans to undertake a phased approach to becoming a PC and achieve compliance with the relevant NERC standards and requirements, as approved by the British Columbia Utilities Commission (BCUC). The stages of the transition plan are:

> Establish the BC Hydro PC function and compliance with the applicable NERC standards and requirements for BC Hydro owned Bulk Electric System (BES) assets.
>
> Extend PC services for the Independent Power Producers (IPPs) and Transmission Voltage Customers (TVCs)) that are interconnected to BC Hydro's BES system and are also registered for specific relevant Mandatory Reliability Standards (MRS) functions but excluding those registered as Transmission Planners (TPs) such as FortisBC Inc. (FortisBC).
>
> After evaluating the outcome of the first two stages, BC Hydro will consider expanding its PC services to other TPs in British Columbia, namely FortisBC.

Guidehouse's assessment is based on lessons learned working with other NERC registered entities both setting up and sustaining the PC function for an entity's own TP area and offering the PC service to other TPs. The Guidehouse team has been assisting registered entities since the advent of the MRS in 2007 and is comprised of former NERC and Regional Entity compliance and enforcement professionals.

Establish the BC Hydro PC function for BC Hydro BES Assets (Phase 1)

Based on Guidehouse's experience assisting other clients implementing PC functions, the functions taking the greatest effort to implement and ensure compliance are administering interconnection and queue administration and performing wide-area engineering simulations and modelling.[1] Development of a new independent Planning Coordinator Office (PCO) within BC Hydro is essential to performing these functions.

BC Hydro will need to establish PCO governance processes that demonstrate transparency and assure independence of PC action separate from the other functional responsibilities of BC Hydro. When acting as the PC, whether for additional entities within its service territory or entities outside its service territory, it will be paramount that the BC Hydro staff remain independent in rendering decisions that will affect the entire covered PC footprint. This will necessarily involve erecting procedures to guarantee BC Hydro employees performing PC functions maintain independence in their decision-making processes for functions that involve their PC responsibilities.

There are several components to establishing the PCO:

Establishing the processes to ensure the PCO receives data and communications required by the NERC Standards (e.g., MOD-001-1a, MOD-004, MOD-008 R3 and PRC-024 R4). Coordinating work with the various BC Hydro departments involved in the interconnection process will take time particularly when implementing FAC-002-2.

BC Hydro will need to create the processes to execute new functions not previously performed by BC Hydro, such as validating steady state and dynamic load modelling (MOD-033-2) and ensuring appropriate consideration of geomagnetic disturbances (TPL-007–4).[2] There is also new content related to steady state and dynamic load modeling and transmission planning that will need modeling improvements (MOD-032-1 and TPL-001-5.1). Some of these new or improved functions may require procurement of both equipment and software as well as training. Time must be allowed for the procurement, installation, and training.

Tasks will need to be allocated between the PC and TP functions for NERC Reliability Standards which identify both entities to perform portions of the reliability services. For the TPL-001, TPL-007, and FAC-014 Reliability Standards, the primary responsibility appears to lie with the entity closer to the source of the compliance data, the TP. Responsibility is split between PC and TP for IRO-017 (Outage Coordination). For FAC-002, primary responsibility in resolving issues related to the border area interconnections will be with the PC. IRO-017 R4 will require the PC/TP to jointly develop solutions and necessitate a process to resolve any conflicts.

A single interconnection queue that treats all resource options equitably will need to be developed. This will require developing business processes, drafting/negotiating agreements, and integrating the currently separate activities of the various BC Hydro departments involved in interconnection activities.

[1] Broadly, the NERC standards covering these functions are FAC-002, MOD-033, PRC-012, TPL-001, and TPL-007.

[2] Adoption of TPL-007-4 is presently held in abeyance but the BCUC has indicated that a separate process would be established to consider this matter as it pertains to BC.

Finally, the PCO will need to be staffed and trained to ensure compliance from its first day of operation. Moreover, obtaining the needed expertise may require outside assistance requiring time to engage qualified contractors, provided they are available when needed.

The complexity of these tasks warrants sufficient lead time to ensure the PCO is functional by the end of Phase 1 before proceeding on to later phases. Furthermore, BC Hydro will need to evolve its program to ensure compliance with standards that come into effect which could impact the implementation timeline of later phases. BC Hydro should evaluate effectiveness of its implementation of the PCO before including other entities under later phases.

Extend PC services for the IPPs and TVCs interconnected to the BC Hydro BES (Phase 2)

Phase 2 will seek to extend the processes developed in Phase 1 to those IPPs and TVCs interconnected to BC Hydro's BES and registered for certain relevant functions in the British Columbia MRS program (Interconnected Entities). This Phase will introduce new processes to define the interaction of the PCO with BC Hydro's Interconnected Entities that elect to have BC Hydro act as their PC.

BC Hydro will need to develop independent stakeholder committees as part of the PCO to address PC responsibilities objectively and implement a dispute resolution process to resolve stakeholder disputes. Each of these tasks is time consuming.

Processes must be developed to ensure the necessary data, identified in Phase 1, is also collected from the Interconnected Entities and transmitted to the PCO. BC Hydro presently relies on existing interconnection agreements to gather the needed information from IPPs and TVCs connected to its system; however, further agreements will need to be in place to ensure the additional necessary information flows to the PCO. Development of new processes and negotiation of the various operating and compliance agreements is a lengthy and time-consuming process.

This phased process to incorporate new BES facilities under the PCO is consistent with the PC implementation plan previously approved by WECC when including BES facilities owned by other entities into a particular PC's Planning Coordinator footprint.[3] This approach will ensure that reliability is maintained throughout the transition process by maintaining continuity of reliability services and putting the proper processes in place to avoid compliance issues.

An evaluation of the effectiveness of the implementation of this phase should be performed by BC Hydro before considering moving to phase 3.

[3] *See* Methodology for Defining Planning Coordinator Areas in the WECC Region, September 2015, page 11. "Through a coordinated implementation plan, the ERO Enterprise compliance program should provide the Planning Coordinators flexibility and time to establish relationships, and incorporate additional facilities into their Planning Coordinator footprint within their normal planning cycles."

Consider expanding the PC function to include other TPs, such as FortisBC (Phase 3)

Phase 3 will face many of the same challenges of Phase 2 but the resolution of seams issues will be more complex because it will include covering new assets beyond the BC Hydro service territory, presently overseen by another TP, FortisBC, including integrating processes for FortisBC's customers. Coordination processes will also need to be developed with the adjacent TP/PCs for which BC Hydro may not have existing relationships.

Some of the significant seams issues[4] involved in extending the PCO's coverage beyond BC Hydro's service territory include:

Coordinated System Planning

- Cost Allocation of study and network upgrade costs (between systems and within systems once portions are allocated) will need to be established.
- Timing of planning analyses, base case creation, and planning horizons will need to be aligned.
- Issues pertaining to the project size selection (best marginal project) and the allocation of "headroom" will need to be resolved.

Interconnections

- Allocation of study and network upgrade costs.[5]
- Managing coordination of queue priority (order of study and management of "headroom").
- Coordination and alignment of interconnection studies timing and design requirements.

Resolution of these issues between planning areas are often complex and take significant time to resolve. The existing Regional Transmission Organizations (RTO) / Independent System Operators (ISOs) have spent many years addressing planning related seams issues and continue to work on resolving some outstanding issues today.[6]

[4] Traditionally, differences in coordination at the boundaries between operational entities are called seams issues.

[5] The most difficult scenario would involve a project on the boundary of the TPs, or a project physically located in one TP but connecting electrically to another TP.

[6] For example, the Inter-Area Planning Stakeholder Advisory Committee (IPSAC) is an open stakeholder group that provides input for the development of the Northeast Coordinated System Plan (NCSP). The NCSP outlines activities conducted jointly by ISO New England, New York ISO, and PJM. Collaboration among the three ISOs/RTOs in the area aims to ensure that the electric system is planned on a wider interregional basis, is proactive, and well-coordinated.

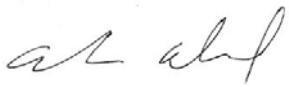
Conclusion

Based on the Guidehouse team's experience with past engagements involving registered entity transition to new functions and a review of BC Hydro's phased implementation approach, we believe that the approach put forward by BC Hydro is reasonable to balance the risks and challenges, enumerated above, faced by transitioning to the PC function. The phased approach ensures the expansion is done in a thoughtful and measured manner to ensure successful implementation, performance, continuous reliability, and compliance of the PC function at BC Hydro from its first day of operation.

Sincerely,

Kenneth C. Lotterhos

Partner



Andrew Dressel

Assoc. Director