

Rapport de la firme GuideHouse FERC Standards of Conducts

Federal Energy Regulatory Commission (FERC) Standards of Conduct

Prepared for:



Hydro-Québec.

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Memorandum

Date: 2022-09-16

Re: Updated “FERC Standards of Conduct Review for Hydro-Québec” Report

Guidehouse has updated the “FERC Standards of Conduct Review for Hydro-Québec” report to include a second organizational change at Hydro-Québec (see Section 6.2, titled “*Implications to Hydro Quebec*”).

Hydro-Québec announced a second reorganization on June 22, 2022. Shortly after the announcement, Hydro-Québec expressed a need to review Guidehouse’s expert report, “FERC Standards of Conduct” (the Report) from 28 June 2021.

Guidehouse conducted a review to assess how the second organizational change made at Hydro-Québec affects Guidehouse’s assessment from June 28, 2021, Standards of Conduct (SoC) report. Guidehouse:

- Reviewed the existing and new organizational chart for Hydro-Québec,
- Identified the location of the Market and Transmission Functions,
- Reviewed the new organization with respect to applicable FERC direction, and
- Updated the final report consistent with the organizational changes.

Please note, the original revision of this report following the first reorganization was submitted to Hydro-Québec on May 31, 2022. However, Guidehouse discovered and updated an incorrect submission date and has taken the opportunity to make minor formatting changes within the report.

Guidehouse completed an extended analysis during the period of review for this updated report and confirms that the conclusions of the first report are unchanged.

Regards,



Robert Baker

Director



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1. Executive Summary

Guidehouse Canada Ltd. (Guidehouse)¹ was retained by Hydro-Québec to review the currently proposed and documented SoC and the organizational design of Hydro-Québec. The review is meant to understand the current state of the SoC, its procedural intent and system of controls and determine its alignment with the regulatory requirements of FERC Order 717.

Guidehouse's approach consisted of an examination of the newly developed Transmission Provider SoC that Hydro-Québec has prepared to determine if the principles identified in FERC Order 717 are addressed in a consistent and comprehensive manner. This approach validated that the provisions in Order 717 that address the requirement to offer fair and equitable treatment of all transmission customers are considered and included in the Hydro-Québec proposed SoC. FERC's SoC for Transmission Providers cover three key areas:

1. Independent performance of the Transmission Function from the Marketing Function so employees operate independently of each other,
2. No conduit with prohibitions related to passing non-public Transmission Function information to employees within Marketing Functions, and
3. Transparency requirements for equal disclosure of non-public Transmission Function information, such as through an Open Access Same time Information System (OASIS) that does not unduly preference any market participant.

Together these standards support the provision of equal and open access to the transmission grid. The assessment and peer review carried out by Guidehouse found that Hydro-Québec's overall proposed SoC aligns well with the principles and intent of FERC Order 717 and that evidence demonstrates that the organizational SoC and procedures are consistent with comparable utility standard practices.

Guidehouse examined the SoC of a peer set of Transmission Providers across Canada and the U.S., consisting of non-FERC regulated utilities that have opted-in to acknowledge FERC Order 717, but are not FERC regulated. The Canadian peer set includes New Brunswick Power, Nova Scotia Power, Manitoba Hydro, SaskPower and BC Hydro, which represent the utilities in Canadian provinces with wholesale-only markets and that have adopted FERC Order 717. In the U.S., the peer set includes Bonneville Power Administration and the Tennessee Valley Authority, who are also non-FERC regulated. This peer set is analogous to Hydro-Québec, which is also non-FERC regulated. It is our finding that the proposed SoC of Hydro-Québec is consistent, in all material respects, with the SoC of the peer set, from the perspective of organization and content.

Guidehouse conducted an examination of the approaches to compliance with FERC Order 717 of the peer set with an emphasis on a set of key disclosures mandated by the FERC, specifically, the designation of a chief compliance officer, disclosure of marketing affiliates and disclosure of Transmission Function and Marketing Function Employees. Guidehouse observes

¹ Guidehouse was formerly Navigant Consulting Ltd.

that the approach of Hydro-Québec to these disclosures is generally aligned with common industry practices as observed in the peer set.

2. Scope of Engagement

Guidehouse was engaged by Hydro-Québec to address the following undertakings:

1. Conduct a Current State Review: Document Guidehouse's review of Hydro-Québec's proposed SoC and organizational design to understand the status of the SoC, its procedural intent and system of controls,
2. Provide expert opinion of Hydro-Québec's proposed SoC and consistency with FERC pro-forma (CFR-2011 – Title 18 – Vol. 1 – Part 358), and
3. Conduct a Benchmarking Analysis and Comparative Analysis describing the approaches of how peer utilities such as TVA, Bonneville Power and BC Hydro, in the United States and Canada fulfill SoC obligations and align to the intent and principle of FERC Order 717.

3. Review of Hydro-Québec Proposed SoC

3.1 Background

Hydro-Québec will be proposing new Transmission SoC and has requested for the replacement of the following documents:

- Transmission Provider Code of Conduct, and
- Transmission Reliability Coordinator Code of Conduct.

The SoC for Transmission Providers include three primary rules:

1. The "independent functioning rule," which requires Transmission Function and Marketing Function Employees to operate independently of each other,
2. The "no conduit rule," which prohibits passing non-public Transmission Function information to Marketing Function employees, and
3. The "transparency rule," which imposes posting requirements to help detect any instances of undue preference due to the improper disclosure of non-public Transmission Function information.

3.2 Guidehouse Review of Hydro-Québec Proposed SoC

In this section, Guidehouse provides its opinion of the consistency of the proposed Hydro-Québec SoC to the FERC 717 SoC as codified in Title 18 Part 358 of the U.S. Code of Federal Regulations (CFR).²

Guidehouse observes that there are three key questions to be addressed as part of the review of an electric utility's Transmission SoC. These questions are:

1. What is the level of alignment with the content and format of the proposed SoC in comparison to the FERC 717 Principles?
2. Is the document organized in such way that there is a clear relationship between the FERC 717 Principles and the sections of the proposed SoC?
3. Are the proposed SoC comprehensive and inclusive of the central principles embodied in FERC 717 and do they address each component of FERC 717 in a thorough manner?

To conduct this review and address these questions, Guidehouse performed the following activities:

² [FERC Order 717](#) as codified in Title 18 Part 358 of the U.S. Code of Federal Regulations (CFR).

1. Conducted a review of the overall alignment and organization of the proposed Hydro-Québec SoC the Guidehouse, and
2. Conducted a comparison of the provisions in the Hydro-Québec proposed SoC to the specific requirements of FERC 717 as codified in Title 18 Part 358 of the U.S. CFR.

Overall Alignment and Organization

To conduct the review of the overall alignment and organization of the proposed SoC, Guidehouse examined the structure of the document, including the Table of Contents, to assess how well aligned organization of the document is to the Federal code and evaluate the level of clarity and accessibility.

Guidehouse observes that the FERC 717 Principles, as codified in Title 18 Part 358 of the U.S. Code of Regulations, contains eight chapters as shown below in Table 3-1.

Table 3-1: Comparison of U.S. Federal Code Title 18 Part 358 with Hydro-Québec Proposed SoC

U.S. Federal Code Title 18 Part 358	Hydro-Québec Table of Contents
§ 358.1 Applicability	Chapter 1 – Definitions
§ 358.2 General principles	
§ 358.3 Definitions	Chapter 2 – General principles
§ 358.4 Non-discrimination requirements	Chapter 3 – Non-discrimination requirements
§ 358.5 Independent functioning rule	Chapter 4 – Independent functioning rule
§ 358.6 No conduit rule	Chapter 5 – No conduit rule
§ 358.7 Transparency rule	Chapter 6 – Transparency rule
	Chapter 7 – Reliability Coordinator appointed by the Régie
§ 358.8 Implementation Requirements	Chapter 8 – Implementation and specifics

Guidehouse observes that Title 18 Part 358 of the U.S. Federal Code contains eight chapters and that these chapters are well aligned with the Table of Contents in the proposed Hydro-Québec SoC. In addition, due to Hydro-Québec’s role as Reliability Coordinator in the Province of Québec, Chapter 7 in the proposed SoC of Hydro-Québec describes the governance of activities of any Hydro-Québec personnel under the authority of the Reliability Coordinator appointed by the Régie and the applicability of FERC Order 717 to these personnel. Guidehouse observes that it is appropriate to designate employees performing Reliability Coordinator functions as Transmission Function Employees. This is described further in Chapter 6: Role of the Reliability Coordinator and Relationship with FERC SoC.

Comparison of Key Provisions for Content and Comprehensive

To conduct a comparison of the key provisions in FERC Order 717 to the proposed SoC, Guidehouse carried out a thorough, line by line, evaluation to identify the level of consistency of the FERC provisions with the proposed SoC. This evaluation is summarized in Table 3-2 below.

Table 3-2 Comparison of Hydro-Québec (HQ) Proposed SoC with FERC Order 717

FERC Code	HQ Proposed SoC	Guidehouse Observations
<p>18 CFR § 358.1 – Applicability This part applies to any public utility that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce and conducts transmission transactions with an affiliate that engages in Marketing Functions.</p>	<p>These SoC apply to the Corporation, that owns, operates or controls facilities used for the transmission of electric energy in commerce with other provinces or the United States and conducts transmission transactions with an affiliate that engages in wholesale Marketing Functions.</p>	<p>HQ SoC appropriately addresses the key provisions of 18 CFR § 358.1 High Consistency</p>
<p>18 CFR § 358.4 - Non-discrimination requirements As more fully described and implemented in subsequent sections of this part, a Transmission Provider must treat all transmission customers, affiliated and non-affiliated, on a not unduly discriminatory basis, and must not make or grant any undue preference or advantage to any person or subject any person to any undue prejudice or disadvantage with respect to any transportation of natural gas or transmission of electric energy in interstate commerce, or with respect to the wholesale sale of natural gas or of electric energy in interstate commerce.</p>	<p>In accordance with the following sections, the Transmission Provider must treat all transmission customers, affiliated and non-affiliated, on a not unduly discriminatory basis, and must not grant any undue preference or advantage to any person with respect to electric energy transmission services.</p>	<p>HQ SoC appropriately addresses the key provisions of 18 CFR § 358.4 High Consistency</p>

FERC Code	HQ Proposed SoC	Guidehouse Observations
<p>18 CFR § 358.5 - Independent functioning rule As more fully described and implemented in subsequent sections of this part, a Transmission Provider's Transmission Function Employees must function independently from its Marketing Function Employees, except as permitted in this part or otherwise permitted by Commission Order.</p>	<p>In accordance with the following sections, Transmission Function Employees must function independently from wholesale Marketing Function Employees, except as permitted in these Standards or subject to an authorization granted by a decision of the Régie de l'énergie.</p>	<p>HQ SoC appropriately addresses the key provisions of 18 CFR § 358.5 High Consistency</p>
<p>18 CFR § 358.6 - No conduit rule As more fully described and implemented in subsequent sections of this part, a Transmission Provider and its employees, contractors, consultants, and agents are prohibited from disclosing, or using a conduit to disclose, non-public Transmission Function information to the Transmission Provider's Marketing Function Employees.</p>	<p>In accordance with the following sections, the Transmission Provider and its employees or any agent are prohibited from disclosing, or using a conduit to disclose, non-public Transmission Function information to wholesale Marketing Function Employees.</p>	<p>HQ SoC appropriately addresses the key provisions of 18 CFR § 358.6 High Consistency</p>
<p>18 CFR § 358.7 - Transparency rule As more fully described and implemented in subsequent sections of this part, a Transmission Provider must provide equal access to non-public Transmission Function information disclosed to Marketing Function Employees to all its transmission customers, affiliated and non-affiliated, except as permitted in this part or otherwise permitted by Commission Order.</p>	<p>In accordance with the following sections, the Transmission Provider must provide equal access to all non-public Transmission Function information disclosed to wholesale Marketing Function Employees to all its transmission customers, affiliated and non-affiliated, except in cases permitted by these Standards and subject to other authorizations granted by the Régie de l'énergie.</p>	<p>HQ SoC appropriately addresses the key provisions of 18 CFR § 358.7 High Consistency</p>

Guidehouse observes that the proposed SoC are highly consistent with FERC Order 717. Each of the FERC 717 Principles is addressed appropriately and in a comprehensive fashion.

4. Review of Approaches of How Peer Utilities Fulfill SoC Obligations and Align to the Intent and Principles of the FERC Order

In addition to reviewing the proposed SoC and conducting a comparison in relation to FERC 717, Guidehouse also conducted a peer review benchmarking evaluation in order to understand how other utilities approach the obligations of FERC 717 and demonstrate their intent to fulfill the principles of FERC 717. Guidehouse selected a set of Canadian and U.S. electric Transmission Providers who are not FERC regulated, but opt-in to the abide by the FERC SoC. This peer set is analogous to Hydro-Québec, which is also non-FERC regulated.

4.1 Peer Group Benchmarking

The peer set includes the following utilities

1. New Brunswick Power,
2. BC Hydro,
3. Manitoba Power,
4. SaskPower,
5. Nova Scotia Power,
6. Bonneville Power Administration (BPA), and
7. Tennessee Valley Authority (TVA).

In this section, Guidehouse provides an analysis of the SoC of Canadian utilities and their alignment with FERC Order 717. Additionally, key elements are identified in the benchmarking study, such as background facts, reasons for switching and any other information to help understand the landscape surrounding the respective SoC.

4.1.1 New Brunswick Power

New Brunswick's Electricity Act (the "Act") which was proclaimed on October 1, 2013, established the amalgamation of the New Brunswick System Operator (NBSO) with New Brunswick Power Corporation (NB Power). The government stated that the amalgamation would lead to establishing a separation of functions and compliant SoC which would allow an integrated company to meet both North American Electric Reliability Corporation (NERC) and FERC requirements.³

³ [Énergie NB Power. *Transmission & System Operator*.](#)

The Act also requires NB Power to adopt a Standard of Conduct compliance program, and to apply to the Energy and Utilities Board for approval of same. The intent of NB Power is to implement Standards of Conduct (SoC) governing itself and its affiliate (New Brunswick Energy Marketing Corporation, referred to as “Energy Marketing”) which substantially conform to those required by FERC. The ultimate purpose of the SoC is to satisfy FERC requirements in order to preserve access to FERC jurisdictional transmission systems, and to preserve the Market Based Rate Authorization (MBRA) issued by FERC and held by Energy Marketing.⁴

These written procedures implement the SoC and apply to interactions and communications between Transmission Function Employees, Marketing Function Employees, or any other employees likely to become privy to Transmission Function information in performing their roles and responsibilities. Accordingly, this document will be distributed to these employees and any new employees that fall within these categories and posted on the internet website. Table 4-1 below shows a summary of the regulatory context and marketing affiliate information for NB Power.

Table 4-1 NB Power Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order No. 717 since 2013	New Brunswick Energy Marketing Corporation	New Brunswick Energy and Utilities Board	Chief Financial Officer & Senior Vice President Corporate Services New Brunswick Power Corporation

4.1.2 BC Hydro

In 2010, (in accordance with the Clean Energy Act)⁵ BC Hydro became the operator of the transmission system and responsible for the administration of the Open Access Transmission Tariff (OATT). The OATT requires that BC Hydro follow British Columbia Utilities Commission (BCUC) polices and the FERC reciprocal access standards in operating the transmission system (Standards of Conduct or SoC). New SoC were approved by the BCUC and became effective on July 5, 2010.

The new SoC refocus the rules on the areas in which there is the greatest potential for abuse and eliminate barriers to the free flow of information that does not have material potential for abuse. These written procedures implement the SoC and apply to interactions and communications between Transmission Function Employees, Marketing Function Employees,

⁴ [Énergie NB Power. Standards of Conduct.](#)

⁵ Sections 21 to 33 of the [Clean Energy Act.](#)

or any other employees likely to become privy to Transmission Function information in performing their roles and responsibilities.⁶

The SoC document is distributed to these employees and any new employees that fall within these categories and posted on the internet website. Table 4-2 below shows a summary of the regulatory context and marketing affiliate information for BC Hydro.

Table 4-2 BC Hydro Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order No. 717 since 2010	Powerex Corp	British Columbia Utilities Commission (BCUC)	Executive Vice President, People, Customer & Corporate Affairs

4.1.3 Manitoba Hydro

In 2010 and 2014, Manitoba Hydro issued revisions of its SoC for Providing Open Access Transmission and Interconnection Service to align with Order 717.⁷ The general principles of the SoC require that Manitoba Hydro’s employees engaged in transmission system operations, function independently from employees engaged in marketing and sales, and that Manitoba Hydro treat all transmission customers on a non-discriminatory basis. The SoC also require that Manitoba Hydro post on its OASIS or its internet website, current written procedures for implementing the SoC in such detail as will enable customers to determine that Manitoba Hydro is in compliance with the requirements of the SoC. These SoC for Providing Open Access Transmission and Interconnection Service Implementation Procedures (Implementation Procedures) are intended to identify the key processes and procedures necessary to maximize the likelihood of compliance with the SoC, as well as, to allow Manitoba Hydro to manage compliance risk. Table 4-3 below shows a summary of the regulatory context and marketing affiliate information for Manitoba Hydro.⁸

⁶ [BC Hydro. Standards of Conduct \(Transmission\).](#)

⁷ [Manitoba Hydro Standards of Conduct](#)

⁸ Manitoba Hydro. [OE Docket No. EA-281-C.](#)

Table 4-3 MB Hydro Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order No. 717 since 2010 and 2014	Manitoba Hydro Wholesale Power Marketing	Public Utilities Board	Manitoba Hydro General Counsel & Corporate Secretary.

4.1.4 SaskPower

SaskPower renewed their SoC Policy in 2013. The SoC Policy ensures that all transmission customers, affiliated and non-affiliated, are treated on a non-discriminatory basis and that SaskPower cannot operate its transmission system to preferentially benefit its Marketing Function Employees or any non-affiliated transmission customers. The SoC Policy also ensures that Transmission Function Employees function independently from SaskPower’s Marketing Function Employees.⁹ Table 4-4 below shows a summary of the regulatory context and marketing affiliate information for SaskPower.

Table 4-4 SaskPower Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order No. 717 since 2013	North Point Energy Solutions	Saskatchewan Rate Review Panel	Vice President Supply Chain

4.1.5 Nova Scotia Power

The SoC are applicable to Nova Scotia Power and its employees and the employees of its Affiliates. The SoC Order¹⁰ govern Nova Scotia Power’s relationships with its transmission customers and potential customers, including employees of Nova Scotia Power and its Affiliates. Table 4-5 below shows the regulatory context and marketing affiliate information for Nova Scotia Power.

⁹ SaskPower. [Standards of Conduct](#).

¹⁰ NS Power. [Standards of Conduct](#).

Table 4-5 Nova Scotia Power Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order since 2004	Nova Scotia Power Fuels, Energy and Risk Management	Nova Scotia Utility and Review Board (UARB)	Chief Compliance Officer

4.1.6 BPA

FERC SoC under Order 717 requires Transmission Providers to provide non-discriminatory, and not unduly preferential access to transmission service or transmission system information to all of its transmission customers, and without preference to its own affiliated Marketing Function Employees (MFEs).¹¹

To ensure open and fair transmission markets so that customers have equal access to transmission, the SoC includes three basic principles:

1. The Independent Functioning Rule requires Transmission Function Employees and MFEs to operate independently of each other,
2. The No Conduit Rule prohibits the passing of SoC restricted transmission information to MFEs, and
3. The Transparency Rule imposes posting requirements to help detect any instances of undue preference.

Table 4-6 BPA Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order 717	Power Services	FERC, NERC, Western Electricity Coordinating Council (WECC)	Chief Compliance Officer Agency Compliance & Governance

4.1.7 TVA

TVA is not a regulated utility under Section 201(e) of the Federal Power Act and, thus, is not directly subject to the requirements of FERC Orders Nos. 888, 889, 2004, 717, and other FERC

¹¹ BPA. [Standards of Conduct](#).

orders related to the SoC. TVA has elected, however, to comply voluntarily with these FERC orders and the associated regulations, to the extent they are consistent with TVA’s responsibilities under the TVA Act and other applicable law.¹²

Table 4-7 TVA Regulatory Context and Marketing Affiliate Information

Code of Conduct	Marketing Affiliate	Regulatory Authority	Chief Compliance Officer for SoC
Based on FERC Order 717	TVA Marketing and Sale Unit (integrated division)	FERC, NERC	Chief Compliance Officer

4.2 Comparative Summary

In addition to conducting a review of the Hydro-Québec proposed SoC to evaluate alignment and consistency with the FERC 717 Principles, Guidehouse conducted a comparative analysis of a set of peer utilities to understand how these companies apply their SoC.

Table 4-8 below describes how the SoC for Transmission Providers are applied internally for peer utilities; who is responsible for enforcing them; who is responsible for compliance management as well as training, standard interpretations, and compliance culture. The table below also specifies the oversight mechanisms for the transmission service provider as well as the functions of the Reliability Coordinator.

¹² TVA. [Standards of Conduct](#).

Table 4-8 Summary of Comparative Analysis for Peer Utilities

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
NB Power	Adheres to FERC Order 717.	SoC is distributed to all employees including newly hired employees and is also posted on the internet website.	NB Power has a Chief Compliance Officer who is responsible for the oversight and management of the SoC.	Written procedures implement the SoC and apply to interactions between Transmission and Marketing Function Employees. Additionally, the Transmission Provider is required to public disclose any voluntary consent or information provided to Marketing Function Employees.	The Transmission and System Operator (T&SO) is responsible for overseeing the reliable operation of the Maritimes Area. The T&SO works at coordinating all users of the power system, directs the generator to balance the supply and demand of electricity and flow across the high voltage transmission lines.

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
BC Hydro	Adheres to FERC Order 717.	SoC is distributed to all employees including newly hired employees and is also posted on the internet website.	BC Hydro has a Chief Compliance Officer who is responsible for the oversight and management of the SoC.	A list of job titles and descriptions of transmission employees are posted on BC Hydro's website. Additionally, there are posting requirements for the identification of affiliate information, voluntary consent to disclose information, shared facilities and transfer of employees, contemporaneous disclosure and potential merger partners.	<p>The Reliability Coordinator (RC) functions are governed by three basic principles:</p> <p>Independence – RC Employees must operate independently of MFEs</p> <p>Priority to reliability – RC Employees will treat all system users equally.</p> <p>Emergency actions – In an emergency circumstance that could jeopardize operational reliability, the RC may take whatever steps are necessary to maintain the reliability of the electric power transmission system.</p>

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
MB Hydro	Adheres to FERC Order 717.	SoC is posted on website.	Manitoba Hydro promotes a culture of compliance throughout the organization and has a designated Compliance Officer who reviews the SoC changes Initiated by MB Hydro or the FERC.	Transmission employees are restricted from exchanging information with Marketing Function Employees. In the event information is exchanged, the incident must be immediately reported to the compliance officer. If information is exchanged intentionally, an individual may be subject to disciplinary action.	The RC is responsible for aligning power generation and transmission among multiple utilities to serve demand within the integrated regional wholesale market. One of the principal functions of the RC is to schedule adequate generating and reserve capacity.

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
SaskPower	Adheres to FERC Order 717.	Provide SoC training to all employees and provide written guidelines to all employees as well as post on website.	Designated Chief Compliance Officer who is responsible for the oversight and management of SoC.	Written procedures implement the SoC and apply to interactions between transmission and Marketing Function Employees. Additionally, the Transmission Provider is required to public disclose any voluntary consent or information provided to Marketing Function Employees.	The SaskPower RC functions associated with power supply reliability include review and approval of planned transmission facility line outages, planned generation outages, monitoring of real-time loading conditions, loading relief procedures, generation re-dispatch, reliability evaluations of the integrated transmission and generation systems and coordination/communication with other RCs. SaskPower RC procedures and policies are consistent with those of NERC.

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
NS Power	Adheres to FERC Order 717.	SoC and written implementation procedure.	Designated Chief Compliance Officer who is responsible for the management of compliance procures in reference to SoC.	Written procedures implement the SoC and apply to interactions between Transmission and Marketing Function Employees. Additionally, the Transmission Provider is required to public disclose any voluntary consent or information provided to Marketing Function Employees.	The Reliability Coordinator is responsible for providing services according to the reliability rules of the Northeast Power Coordinating Council which involves coordinating all users of the power system.

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
Bonneville Power Administration	Adheres to FERC Order 717.	The SoC office is responsible for the distribution of the SoCs and the written implementation procedure.	Designated Chief Compliance Officer is responsible for management of compliance procures in reference to SoC.	Written procedures implement the SoC and apply to interactions between Transmission and Marketing Function Employees. Additionally, the Transmission Provider is required to public disclose any voluntary consent or information provided to Marketing Function Employees.	<p>The RC is responsible for ensuring that each member operates with a focus on reliability, particularly across the transitions, or seams, from one area of responsibility to the next.</p> <p>To accomplish this task, the RC receives real-time data from the various entities within its geographic span and models those systems to ensure the stability and reliability of the grid. RC West is the Reliability Coordinator of BPA.</p>

Utility Name	Alignment of SoC to FERC	SoC Enforcement	Compliance Management	Oversight Mechanisms for Transmission Service Provider	Reliability Coordinator Functions
TVA	Adheres to FERC Order 717.	The SoC is made available online and communicated to all employees.	Designated Chief Compliance Officer is responsible for management of compliance procures.	Written procedures implement the SoC and apply to interactions between Transmission and Marketing Function Employees. Additionally, the Transmission Provider is required to public disclose any voluntary consent or information provided to Marketing Function Employees.	The TVA RC is responsible for verifying the results, coordinating with TO's and BAs in reviewing and/or modifying the preliminary action plan, and issuing an approved action plan to mitigate the exceedances in the TVA RC Area.

4.2.1 Transmission Function Employees Job Descriptions

Under the transparency provision (18 CFR 358.7(f)(1)), a Transmission Provider must post on its internet website the job titles and job descriptions of its Transmission Function Employees. All peer utilities reviewed in this study post the job descriptions of their Transmission Function Employees on their respective websites thereby aligning with the intent of the transparency rule under the FERC 717 Order. The job titles and organization of departments vary from utility to utility and is therefore not comparable on a one-to-one basis. However, in general most utilities have the following departments in which their Transmission Function Employees belong to:¹³

1. System Control Department,
2. Program Development,
3. Emergency Operations,
4. Network Resources Management,
5. System/Grid Operations, and
6. Tariff and Interconnection Services Unit.

All utilities in the peer set effectively identify the separation of the roles and duties of Transmission Function Employees versus Market Function Employees. The documents

¹³ [BC Hydro TFEs](#), [MB Hydro TFEs](#), [NS Power TFEs](#), [NB Power TFEs](#), [SaskPower TFEs](#), [BPA TFEs](#), [TVA FTE](#)

published online for all peer utilities clearly describe the difference in roles and responsibilities for the two entities leaving no grey areas or room for confusion on the responsibilities of each employee.

Guidehouse observes that Transmission Providers have to exercise judgement in determining which employees are Transmission Function Employees. The FERC, in Order 717 defines a Transmission Function Employee and Transmission Functions as follows:

1. Transmission Function Employee means an employee, contractor, consultant or agent of a Transmission Provider who actively and personally engages on a day-to-day basis in transmission functions.¹⁴
2. Transmission Function means the planning, directing, organizing or carrying out of day-to-day transmission operations, including granting and denying transmission service requests.¹⁵

Guidehouse notes that it is common industry practice to classify employees that have the ability to effect a change in the topology of the transmission system as Transmission Function Employees. In addition, Guidehouse observes that it is common industry practice to classify Information Technology (IT) support staff who directly provide support or maintain the computer systems that enable real-time operations, such as SCADA or Transmission Energy Management Systems as Transmission Function Employees.

Guidehouse conducted a review of the proposed Transmission Function Employee and Marketing Function Employee roles and responsibilities provided by Hydro-Québec. Guidehouse observes that the defined roles and responsibilities as proposed by Hydro-Québec are aligned with observed common industry practices.

¹⁴ [FERC Order 717, Issued October 16, 2008 Paragraph 41](#)

¹⁵ [FERC Order 717, Issued October 16, 2008 Paragraph 37](#)

5. Implementation Summary

Guidehouse conducted a review of the implementation procedures of the peer utilities to understand their approaches to implementing their SoC. Below in Table 5-1, we provide a high-level summary of the implementation practices of peer utilities. Guidehouse observes that it is common industry practice to be descriptive of the approach to implementation to indicate how the Transmission Provider is upholding the FERC 717. For example, to demonstrate the approach to compliance with the Non-Discrimination Requirement, each of the peer utilities describes the implementation practices in a specific manner.

Table 5-1 Key Implementation Practices of Peer Utilities

Key Takeaway /Implementation Practice	NB Power	BC Hydro	MB Hydro	SaskPower	Nova Scotia Power	BPA	TVA
Non-discrimination Requirement							
Strictly enforce all guidelines provisions to the sale or purchase of open access transmission service.	✓	✓	✓	✓	✓	✓	✓
Apply all provisions in a fair and impartial manner	✓	✓	✓	✓	✓	✓	✓
Process all requests similarly within the same time period.	✓	✓	✓	✓	✓	✓	✓
Independent Functioning Rule							
Transmission Functions and Marketing Functions must have physical separations.	✓	✓	✓	✓	✓	✓	✓

Key Takeaway /Implementation Practice	NB Power	BC Hydro	MB Hydro	SaskPower	Nova Scotia Power	BPA	TVA
Transmission Functions and Marketing Functions must have access restrictions.	✓	✓	✓	✓	✓	✓	✓
Joint meetings and interactions between Transmission and Marketing Function Employees is generally prohibited.	✓	✓	✓	✓	✓	✓	✓
No Conduit Rule							
Transmission Provider shall not use anyone as a conduit for the disclosure of non-public Transmission Function information to its MFEs	✓	✓	✓	✓	✓	✓	✓
All employees, contractors, consultants, or agents are prohibited from disclosing non-public Transmission Function information to any MFEs.	✓	✓	✓	✓	✓	✓	✓
Transparency Rule							
Voluntary consent provision.	✓	✓	✓	✓	✓	✓	✓
Posting written procedures on the internet.	✓	✓	✓	✓	✓	✓	✓
Identification of employee information publicly on website.	✓	✓	✓	✓	✓	✓	✓

Key Takeaway /Implementation Practice	NB Power	BC Hydro	MB Hydro	SaskPower	Nova Scotia Power	BPA	TVA
Enforce contemporaneous disclosure.	✓	✓	✓	✓	✓ ¹⁶	✓	✓

¹⁶ In 2009 temporary exemption from part of the Standards of Conduct was permitted for designated NSPI employees to have access to non-public transmission related information for the purposes of completing an update to the NSPI Integrated Resource Planning. [Link](#).

6. Role of the Reliability Coordinator and Relationship with FERC SoC

The mission of the NERC is to assure the effective and efficient reduction of risks to the reliability and security of the bulk electric transmission grid in North America, including Canada, Mexico and the United States. NERC is subject to oversight by provincial government authorities in Canada and by the FERC in the United States.

NERC has established the role of Reliability Coordinators to continuously assess transmission reliability and coordinate emergency operations among the operating entities within a specific region. The responsibilities and authorities of the Reliability Coordinator are governed by NERC Standard IRO-001: Reliability Coordination.¹⁷

NERC Standard IRO-001 states that Reliability Coordinators must have the authority, plans, and agreements in place to immediately direct reliability entities within their Reliability Coordinator Areas to re-dispatch generation, reconfigure transmission, or reduce load to mitigate critical conditions to return the system to a reliable state.

If a Reliability Coordinator delegates tasks to others, the Reliability Coordinator retains its responsibilities for compliance with NERC and regional standards. SoC are necessary to ensure the Reliability Coordinator does not act in a manner that favors one market participant over another.

6.1 Relationship of Reliability Coordinator SoC and the FERC SoC

In this section, Guidehouse discusses the relationship between the NERC Reliability Coordinator SoC and the FERC SoC.

Across North America, the responsibilities of the Reliability Coordinator are typically executed by regional entities that are separate organizations from the regional Transmission Providers. For example, the California Independent System Operator (CAISO) manages the transmission system for the majority of California, including the Reliability Coordinator role (RCW), while regional Transmission Providers are separate organizational entities. The exceptions to this status, include the Canadian provinces of British Columbia, New Brunswick, Saskatchewan and Québec, as well as TVA and Southern Company in the U.S., as shown in Figure 6-1 below. In these cases, the roles of the Transmission Service Operator and the Reliability Coordinator are conducted by separate organizations within one entity.

¹⁷ [NERC Standard IRO-001](#)

Figure 6-1: NERC Reliability Coordinators¹⁸



In situations where the Transmission Provider is performing Reliability Coordinator functions, Guidehouse observes that staff performing Reliability Coordinator functions are subject to the FERC SoC and are considered Transmission Function Employees specifically to protect the independence of performing the Reliability Coordinator roles and responsibilities.

¹⁸ [Reliability Coordinator Map from NERC](#)

Moreover, in situations where one entity is both the Transmission Service Provider and Reliability Coordinator, it is typical for persons providing Reliability Coordinator functions to be subject to the FERC SoC and to be considered Transmission Function Employees.

To determine standard and accepted industry practice, Guidehouse reviewed NERC Standard IRO-001 compliance procedure and the Transmission Function Employee Roles and Responsibilities of BC Hydro, New Brunswick Power, Saskatchewan Power Corporation (SaskPower), Southern Company and TVA that describe how the employees with Reliability Coordinator responsibilities at these utilities are classified as Transmission Function Employees.

6.2 Implications for Hydro-Québec

In Québec, the Régie de l'énergie (Régie) is responsible for the reliability of the power transmission system in Québec and issues mandates to various organizations to help it perform this duty. The Régie has designated a subsidiary of Hydro-Québec, DPCMEER (Direction Principale – Contrôle des Mouvements d'Énergie et Exploitation du Réseau [system control and operation]), as the Reliability Coordinator.

The mandate from the Régie to DPCMEER to perform the Reliability Coordinator functions include setting of reliability standards and maintaining transmission system reliability. The mandates of the Reliability Coordinator are described below.

1. Set reliability standards:
 - a. File with the Régie, the standards proposed by the organization mandated to develop reliability standards, and an assessment of the relevance and impact of these standards,
 - b. File with the Régie, the Registry of entities subject to the reliability standards it has adopted, and
 - c. Submit to the Régie a guide for assessing sanctions to be adopted if standards are violated.
2. Maintain transmission system reliability:
 - a. Perform the Reliability Coordination duties set out in the adopted standards, including issue operating instructions.

Hydro-Québec has several subsidiaries with different roles and responsibilities, that work together to operate the electric transmission grid in Québec. In addition to the roles of the Reliability Coordinator and transmission operator, performed by DPCMEER, the transmission service provider is Hydro-Québec when carrying on electric power transmission activities within the meaning of the Act.

The activities of these groups, e.g., the transmission service provider, the Reliability Coordinator, and marketing activities within Hydro-Québec are governed by the FERC SoC, as outlined in this report. In addition, NERC has established standards that govern the specific

responsibilities of the Reliability Coordinator. Activities that are expressly prohibited for Reliability Coordinators as set forth by NERC include the following:

1. **Conducting Marketing Functions:** Similar to Transmission Function Employee, Reliability Coordinators are not permitted to perform Marketing Functions,
2. **Access to control facilities:** Allowing access for Marketing Function Employees to the system control center or similar facilities used for Reliability Coordinator functions that differs in any way from the access available to non-affiliated system users is not permitted,
3. **Disclosing non-public Transmission Function information:** It is not permitted to disclose to any Marketing Function Employees non-public information relating to the planning, directing, organizing or carrying out of day-to-day transmission operations, including the granting and denying of transmission service requests,
4. **Transparency:** If a Reliability Coordinator employee discloses information in a manner contrary to the requirements of this subparagraph, the Reliability Coordinator must, as soon as practicable, post such information on its web site and inform the affected Transmission Provider to post such information on its OASIS, and
5. **Sharing market information:** It is not permitted for Reliability Coordinator employees to share market information acquired from non-affiliated System Users or potential non-affiliated system users or developed in the course of performing Reliability Coordinator functions, with any Marketing Function Employees.

To ensure compliance with NERC and FERC rules, Hydro-Québec has developed a Reliability Coordinator Code of Conduct that prohibits any form of preferential treatment in favor of other Hydro-Québec units or other system users, which was approved in 2007 by the Régie. In addition, Hydro-Québec has designated staff with Reliability Coordinator responsibilities as Transmission Function Employees.

As the Reliability Coordinator, DPCMEER is responsible for adapting the NERC standards to Hydro-Québec, as well as considering any provincial adjustments to be made in order to specifically adapt the standards with consideration of requirements in Québec. This is an important role of the DPCMEER, as it is the Régie that has to adopt the standards in order to make them mandatory in Québec.

As identified in 6.1, Guidehouse observes that it is common industry practice for staff performing Reliability Coordinator functions to be considered Transmission Function Employees.

Guidehouse observes that Transmission Providers have to exercise judgement in determining which employees are Transmission Function Employees. The FERC, in Order 717 defines a Transmission Function Employee and Transmission Functions as follows:

1. Transmission Function Employee means an employee, contractor, consultant or agent of a Transmission Provider who

actively and personally engages on a day-to-day basis in transmission functions.¹⁹

2. Transmission Function means the planning, directing, organizing or carrying out of day-to-day transmission operations, including granting and denying transmission service requests.²⁰

Hydro-Québec's approach is consistent with the intent and principles for FERC and consistent with the approaches of comparable transmission services organizations to identify Transmission Function Employees where Reliability Coordinator functions are being delivered. It is Guidehouse's determination that this compliance approach is aligned with the FERC and NERC principles, as well as aligned with the approaches of similarly situated Transmission Providers with Reliability Coordination responsibilities. Guidehouse confirms the two Hydro-Québec organizational changes which occurred in 2022 do not affect these conclusions.

¹⁹ [FERC Order 717, Issued October 16, 2008](#)

²⁰ [FERC Order 717, Issued October 16, 2008](#)

7. Guidehouse Assertion and Key Findings

To conduct this review and analysis Guidehouse carried out the following evaluations to demonstrate its key findings:

Table 7-1 Guidehouse Key Findings

Test	Guidehouse Comment
Conducted a review of the Hydro-Québec (HQ) proposed SoC and comparatively assessed the SoC against the FERC 717 provisions in CFR 358	
Is the proposed HQ SoC aligned and consistent with the FERC 717 provisions and intent– Is the document organized in such way that there is a clear relationship between the sections of the Standards of Conduct and the FERC 717 core Principles?	Yes – the proposed HQ SoC is well aligned with the FERC 717 provisions and the document is organized in a way to illustrate a clear relationship between the sections of the SoC and the FERC 717 Principles.
Is the proposed HQ SoC complete and comprehensive – does it address every provision? Is the HQ definition of Transmission Function Employees (TFEs) and Marketing Function Employees (MFEs) aligned with the definitions included in CFR 358?	Yes – the proposed HQ SoC addresses every provision and the HQ definitions of TFEs and MFEs are aligned with the definitions of CFR 358.
Conducted a comparative review of a Peer Set of non-FERC regulated Transmission Providers	
Is there evidence that peers have been deemed compliant with FERC 717?	Yes – there is evidence for all peer utilities, through regulatory decision or consultation, that they are compliant with FERC 717.
Are the SoCs of the peer set clearly aligned and consistent with FERC 717 provisions, with substantive evidence?	Yes – there is substantive body of evidence to suggest that the peer set is clearly aligned with all FERC 717 provisions.
Are the implementation procedures of the peers aligned with FERC?	Yes – the implementation procedures of the peer set are aligned with FERC 717 in all cases.

<p>Are the peer’s disclosures, specifically identification of Chief Compliance Officer, Identification of TFEs and Identification of Affiliates, aligned with the FERC mandated disclosure provisions and evidence requirements?</p> <ul style="list-style-type: none"> i. Chief Compliance Officer ii. Written Procedures iii. Transmission Function Employees iv. Identification of Affiliate Information 	<p>Yes – the peer’s disclosures to the items (Chief Compliance Officer, Written Procedures, TFEs, Identification of Affiliate Information) are aligned with the FERC mandated disclosure provisions and evidence requirements.</p>
<p>Conducted a comparison of the Peer Set approaches to SoC implementation with the proposed approach of HQ</p>	
<p>Is the HQ definition of TFE roles and responsibilities substantively and comprehensively similar to the TFE roles and responsibilities posted by the peers?</p>	<p>Yes – the HQ definition of TFE roles and responsibilities are substantively similar to the TFE roles and responsibilities posted by the peers.</p>
<p>Is the proposed identification of Chief Compliance Officer, Identification of TFEs and Identification of Affiliates similar to the approaches of the peer set?</p>	<p>Yes – the proposed identification of Chief Compliance Officer, Identification of TFEs and Identification of Affiliates is similar to the approaches of the peer set.</p>
<p>Given that subsidiaries of HQ, the DPCMEER, are the Balancing Authority (BA) and Reliability Coordinator (RC) within Québec, how do the FERC SoC apply to the HQ Reliability Coordinator functions?</p>	<p>Guidehouse observes that is common industry practice for BA and RC employees to be designated as TFEs.</p>

7.1 Guidehouse Assertion

Guidehouse has the following assertions:

1. **Consistency of Hydro-Québec’s Proposed SoC to FERC Order 717, As Codified in FERC Pro-forma (CFR-2011 – Title 18 – Vol. 1 – Part 358)**

Guidehouse finds that Hydro-Québec’s proposed SoC appropriately address the principles and intent of FERC Order 717. The document is aligned with the provisions of FERC Order 717 and the organization of the document demonstrates a clear relationship between the FERC 717 principles and the sections of the SoC. In addition, the document is complete and

comprehensive. It directly addresses and is inclusive of all of the central principles embodied in FERC 717. For example, Guidehouse observes that the chapters of the Hydro-Québec proposed SoC addresses each of the eight chapters of Title 18 Part 358 of the U.S. Federal Code.

2. Consistency of Hydro-Québec's Proposed SoC with Peer Utility SoC

Guidehouse observes that the Hydro-Québec proposed SoC is consistent with comparable utility common practices. As discussed in Section 4 of this report, the format, content and organization of the Hydro-Québec proposed SoC is aligned with the SoCs of the peer utilities.

3. Benchmarking Analysis and Comparative Analysis of Peer Set Approaches to Fulfilling SoC Obligations and Alignment to the Intent and Principle of FERC Order 717

Guidehouse's examination of the approaches to compliance with FERC Order 717 of Hydro-Québec is aligned with the approaches of the peer set, particularly the designation of a chief compliance officer, disclosure of marketing affiliates and disclosure of Transmission Function and Marketing Function Employees. It is common industry practice to have a chief compliance officer who is responsible for ensuring that the FERC SoC is appropriately implemented and observed. In addition, it is common industry practice to designate a single chief compliance office for both the FERC SoC as well as the code of conduct that governs the activities of the Reliability Coordinator, particularly when the Reliability Coordinator function is integrated within the corporate entity that is also the Transmission Service Provider.

The proposed categorization of Marketing Function Employees by Hydro-Québec is aligned with common industry practices. Guidehouse observes that it is common industry practice to designate as Transmission Function Employees all employees who have the ability to effect a change in the topology of the transmission system. In regard to the designation of Transmission Function Employees, the approach of Hydro-Québec is aligned with observed common industry practice.

Appendix A. Guidehouse Expert Witness Resumes

1. Laura Manz
2. Robert Baker

Laura J. Manz

Director | Energy Sustainability and Infrastructure

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Direct: 858.354.8333

Professional Summary

Ms. Manz brings over 35 years of executive and field experience in electric and natural gas utilities, leading complex and challenging projects for utility, regulator, and developer clients globally. Her expertise is leveraged to advise on strategic and cross-disciplinary areas encompassing grid planning and operations, electricity market design, enabling agreements and tariffs, resource interconnection, rates and ratemaking, distributed energy, and advanced technologies. She was formerly Vice President – Market and Infrastructure Development with the California Independent System Operator (CAISO) where she led regulatory policy, grid planning, market design, distributed energy integration, and reliability compliance.

Her achievements include implementation of wholesale electricity markets in the Mid-Atlantic (PJM), California (CAISO), and Texas (ERCOT). She has served as an expert witness in grid operations, market design, tariff design and compliance, microgrids and distributed energy resources, resource interconnections, and project viability diligence that includes environmental considerations and interactions with local, state and federal agencies. She began her career at Public Service Electric and Gas Company (PSE&G), playing a key role in transitioning PJM from a power pool to an Independent System Operator / Regional Transmission Organization and transitioning PSE&G to a transmission-owning member. She continues to lead strategy development with clients related to open access and market policies, tariff design, rates and ratemaking, strategy for policies and programs for clean and distributed energy, and grid resiliency and hardening.

Relevant project experience:

- Advised Duke Energy and Dominion South Carolina on the creation of the Southeast Energy Exchange Market (SEEM) www.southeastenergymarket.com.
- Conducted a nodal market risk assessment for ERCOT, determining that the nodal wholesale market design, the business and operations protocols, and supporting business systems would support the transition to the nodal market.
- Refined and implemented California's restructured electricity market, bringing nearly 50,000 MW in alignment with international best practices. Held responsibility for ongoing market improvements, grid expansion practices and resource interconnection processing under the updated regulatory policies and tariffs.
- Director Interregional Transmission –As part of "The Supporting Companies," transformed PJM, from a coordinated power pool into an Independent System Operator, including design and implementation of the Open Access Transmission Tariff, grid services charges, nodal market pricing system, engagement rules and technology platform for retail choice for customers in New Jersey. PJM remains the most liquid electricity market in the world and New Jersey's Basic Generation Service retail choice program among the most successful in the U.S.
- Designed and implemented the Renewable Energy Transmission Initiative (RETI) grid expansion initiative under Governor Schwarzenegger to accommodate 33% renewable energy into California's supply portfolio. Spearheaded the Location Constrained Resource Interconnection (LCRI) policy to build out transmission to foster additional areas of renewable development.

Professional Experience

As a Director with Guidehouse, Laura brings thought leadership and expertise to clients, leveraging her experience in transmission operations and planning, rates and tariffs, reliability and regulatory compliance, renewable and distributed energy integration, and due diligence.

Advise several Fortune 200 utilities with impact assessments of regulatory policy changes related to market design, grid planning, resource interconnection, grid hardening and resilience, distributed energy integration, tariff design, participation models and rate impacts.

Developed a standardized Grid Service Purchase Agreement (GSPA) so the Hawaiian Electric Companies could procure power grid services under a consolidated agreement that accommodates purchases from aggregated distributed energy resources and traditional power plants on behalf of the utility as the Reliability Coordinator and transmission service provider.

Led tariff assessment for BC Hydro to evaluate and verify costs of different grid services and propose options for energy imbalance service. The project included conducting an industry scan, analyzing tariffs and rates with a cost allocation model, assessing revenue requirements, and proposing workable options for energy imbalance services.

Led the assessment of Alberta Electric System Operator market and tariff designs. The project included a report for stakeholder discussion related to key functions of an ISO, evaluation of revenue requirements and rates for the grid operator, transmission infrastructure and grid services.

For Lubbock Power and Light conducted an assessment of requirements to assimilate into the ERCOT system and evaluate retail choice implementation options for retail customers. Conducted a gap analysis of systems and organizational processes and developed an implementation roadmap, including provider of last resort options. Identified retail tariff impact assessment for all customers and developed a harmonization plan for equitable treatment for non-affected load and affected load customers.

As Principal with L J Manz Consulting, a sole proprietorship, advised clients on all aspects of strategic and tactical projects with clients that included Fortune 200 utilities, large industrial customers, and ERCOT.

Advised the New Zealand Electricity Commission on electricity market reforms and harmonizing grid operations, with market design, designing a system of financial rights for the Country's transmission operator.

As Vice President Markets and Infrastructure Development with CAISO, led regulatory policy, transmission planning and electricity market development for California's 50,000 MW grid.

Responsibilities included day-to-day and strategic initiatives for transmission planning, grid expansion, market design, transmission maintenance reviews, resource interconnections, and regulatory policy.

- Oversaw the development and administration of the Open Access Transmission Tariff including regulatory policy and filings with the FERC. Led the review and approval process to gain approval from the CAISO Board of Managers, including market design, reliability practices, revenue requirements and charges for grid services.
- Collaborated with state agencies such as the California Air Resources Board (CARB) and State Water Resources Control Board to assure policy objectives such as eliminating once-through cooling, reducing greenhouse gas emissions, and integrating at least 33% of California's supply portfolio with renewable energy resources.
- Responsible policies to integrate Distributed Energy Resources into the grid dispatch with cutting-edge proof-of-concept deployments.

As a Director CAISO and Regulatory Affairs – SDG&E and Southern California Gas Company, led regulatory policy development and deployment for Sempra Energy’s regulated businesses. Responsible for oversight of policy and tariff proposals by the CAISO. Oversaw all of the Case Managers for SDG&E and SoCal Gas, and the organizations’ interactions with FERC, CAISO, CPUC, and CEC on all aspects of electric and natural gas policy, rates, and position advocacy.

As a Director with PSEG led PSE&G’s transmission and wholesale market activities, harmonized federal, regional, and state electricity policy across PSEG’s multiple lines of business related to energy markets, gas and electric rates, reliability compliance, and tariffs for PSEG’s portfolio of businesses. Led PSE&G’s stakeholder participation with PJM for coordinated operations and planning. Represented PSE&G as part of the Supporting Companies to redesign the organization, tariffs and business practices into compliance with FERC requirements for open access. Career highlights also include:

- Led PSEG's participation as a Transmission Owner member of an ISO under FERC Order 888 including applying the seven-factor test for transmission, revenue requirement development, ratemaking and cost recovery options, regulatory filings, and implementing the Transmission Access Charge. Collaborated with PJM to develop FERC “Schedule 1” administrative charges to determine a comprehensive set of costs and revenue requirements and the related filing to FERC to recover the full set of charges under a Schedule 1 / Schedule 1a allocation.
- Senior System Operator on-shift supervisor responsible for the economic and reliable operation of PSE&G's 11 MW power grid with \$1.5 billion of energy transactions annually for 2 million electric customers. Graduate of PJM System Operator Training certification program.

Expert Appearances and Related Work Products

Federal Energy Regulatory Commission

Developed testimony and appeared before the FERC on behalf of Public Service Electric and Gas, San Diego Gas and Electric, Southern California Gas Company, Smart Wires, and Tres Amigas, LLC.

- Expert Witness (litigation and settlement) for Public Service Electric and Gas - <https://www.ferc.gov/whats-new/comm-meet/2010/091610/E-9.pdf>
- Tariff, rates, and rules development and filing California Independent System Operator <https://www.caiso.com/Documents/Sections20-24-FourthReplacementCAISOTariff.pdf>
- Technical witness, San Diego Gas and Electric <https://www.ferc.gov/EventCalendar/Files/20050609143932-Agenda%20Materials%20-%20California.pdf>
- Develop electric rates and testimony, San Diego Gas and Electric <http://www.caiso.com/Documents/100210ADRAudit-InformationalReport-FERCForm3.pdf>
- Develop PJM Supporting Company FERC filing and related testimony including market design and formula rates. Presented at all related FERC technical conferences 1995 through 2005

Education

Bachelor of Science, Electrical Engineering, Lafayette College, Easton, PA

Master of Business Administration, Drexel University, Philadelphia, PA

Robert Baker, P.Eng

Director | Energy Sustainability and Infrastructure

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Direct: 403.554.8221

Professional Summary

Rob is a Director in the Energy, Sustainability & Infrastructure Practice at Guidehouse. He has over 30 years of power system engineering experience in the utility, system operator, and consulting environments.

Rob has extensive thought leadership experience includes growth and transformation to future energy systems including technology applications, renewable, and storage additions; regulatory and policy development; transmission system planning; project management process development and delivery; load and ancillary service forecasting; system operations support; system disturbance process and analysis; and regulatory witness services and support.

Areas of Expertise

Strategy and Vision Planning: Through published work, a technical background, and with project work, have considered possible outcomes of the future energy system. Applied innovative and long-term strategies to connect distributed energy resources (DER), storage, renewable power projects, and inter-ties while maintaining reliability. Developed and applied asset and probabilistic reliability assessment (PRA) techniques to balance future energy system reliability while maintaining a least-cost approach.

Leadership and Management: As a vice president, and as a senior Alberta Electric System Operator (AESO) manager, have developed and led teams of professional engineers, Data Scientists, Ph.D.s, consultants, and project managers conducting specialized power system studies, renewable and traditional generation connections, project management, asset management, distributed generation, and design development. At ESBI, pioneered Independent System Operator policies and procedures related to deregulation. Mentored professionals and built successful teams to address geomagnetic disturbance (GMD) analysis, reliability assessments, new generation connections, and DER. Responsible member for Association of Professional Engineers and Geoscientists of Alberta (APEGA) and APEGS. Developed and executed plans to increase company efficiency by setting up reporting roles and aligning technical processes to become more effective.

Technical Excellence: Identified technology innovations resulting in two Awards of Excellence from the Association of Consulting Engineers of Canada. Tested and acquired operational dispatch software (SaskPower). Provided support for numerous technical papers (for example synthetic inertia, wind forecasting, renewable integration). Pursued and developed, with industry stakeholders, the Y2K power system action plan for Alberta. Over 20 years' experience in system loss evaluation. Developed the AESO losses, load, and ancillary service volume and cost forecast.

Business Development: Examined industry technology trends, identified, and quickly adopted new business opportunities like renewable power connections, NERC compliance (GMD), and PRA. Early adoption resulted in a technical and business advantage coupled with higher revenue and reduced competition. Created and facilitated presentations for clients and industry related to identifying system trends (feasibility evaluation of renewable energy additions, PRA, and DER). Developed and employed a pilot project approach to reduce risk when pursuing new technology applications.

Witness Support: Provided support to various clients by appearing as a technical and/or procedural witness in regulatory hearings in front of commissions and arbitrators in Ontario and Alberta. Provided

witness hearing support as needed (both as an individual and as a team member on panels). Provided written and oral testimony, information responses, interrogatories, responses to undertakings, and intervener interactions. An example is supporting Enbridge in the ATC hearing for Montana Alberta Tie Line (MATL).

Professional Experience

Director, Next Phase Power Inc., Calgary, Alberta

Consulting practice specializing in long-term and sustainable system development, witnessing, and power system connections. Supported Hydro One on a regulatory hearing involving a \$4.5B development.

EVP METSCO, Energy Solutions Inc., Calgary, Alberta

Realigned the company's production staff into a management structure. Developed and was responsible for technical and financial performance in Engineering, Field Services, Asset Management and Data Science.

Vice President, Teshmont Consultants, Calgary, Alberta

Led Office Operations, Financial Performance, Study, Design, Project Management, and Business Development activities. Office start-up (2010), professional practice permit (2 provinces), overall project performance and delivery, proposal review, client service, and staff training, mentoring, and development. Member of the Executive and Management Committee. Initiated innovative study work (GMD, DER, PRA) and tie line study support. Provided witness support for clients on regulatory and technical. Developed innovative Loss factor approaches.

AESO and Transmission Administrator, ESBI Alberta Ltd, Calgary, Alberta

Led areas such as operations, forecasting, planning, project management, and interconnections. Employed artificial intelligence to forecast volumes to allocate \$250 M of loss cost and \$250 M of ancillary service cost/year. Managed the initial wind power forecast development in Alberta. Extensive and successful stakeholder consultation. Standards and technical specifications for load, generation, in Alberta. Developed a Wide Area Measurement Scheme consistent with requirements. Created and applied the project management process for new interconnections. Banff leadership courses (2) and Karass Negotiating training seminar.

Developed and implemented an outage coordination process for Alberta's deregulated market. Developed and implemented the first operational policies and procedures under deregulation. Technical development of the first Reliability Management System between Alberta and WSCC. NERC Y2K coordinator for Alberta in 1998/99.

Various Roles, SaskPower Regina, Saskatchewan, Canada

Evaluated, planned, and made recommendations for the implementation and execution of the Condie to Queen Elizabeth 230 kV, 250 km transmission line. Economic evaluations for transmission asset life extensions and system operation cost reductions. Restructured several technical areas to support corporate reorganization. Developed trading strategies, assessments for opportunities with other utilities, optimized design and long-term cost savings from optimal equipment reuse. Advanced corporate fibre optics planning and utilization. Evaluated best practices and provided recommendations for an overall corporate business unit redesign. Successfully beta tested commercial power flow software examining voltage support options. Tested and introduced the initial computer aided generation dispatch system.

Education

- Bachelor of Science in Electrical Engineering, University of Saskatchewan

Affiliations, Memberships, Activities

- APEGA
- Association of Professional Engineers and Geoscientists of Saskatchewan
- Institute of Electrical and Electronics Engineers (IEEE)

Awards

- Award of Excellence (2017) from the Association of Consulting Engineers of Canada – Manitoba, team member for the AltaLink Geomagnetic Disturbance Vulnerability Assessment project
- Award of Excellence (2014) from the Association of Consulting Engineers of Canada – Manitoba as part of the team for the MATL Remedial Action Scheme (RAS) Project

Workshops and Presentations

- Jaryn Vaile and Robert Baker, “Geomagnetic Disturbances - Power System and Impacts”, 2018 CIGRE Canada Conference, Calgary, 2018
- Numerous industry conferences, committees, discussions, and presentations on various innovation, business, and technical initiatives

Selected Publications

- Jaryn Vaile, Ashraf Haque, Sonjoy Roy, Ashikur Bhuiya, Robert Baker, and Jahangir Khan, “Evaluation of the Effects of Synthetic Inertia under Increasing Wind Power Penetration in Alberta System” submitted to IEEE PES GM 2019, Atlanta, USA
- Soroush Shafiee, Ashikur Bhuiya, Ashraf UI Haque, David King, Rob Baker, “A Practical Application of Probabilistic Asset Management Approach for Ageing Infrastructure Replacement and Investment Analysis”, CIGRE-052 2018 CIGRE Canada Conference Westin Calgary, Alberta, Canada, October 15-18, 2018
- Ashraful (Rony) Islam, David King, Ashraf UI Haque, Robert (Rob) Baker, Maureen Kolla, “Future Challenges for the Planning, Design and Operation of Utility Distribution Systems”, CIGRE-053 2018 CIGRE Canada Conference, Westin Calgary, Alberta, Canada, October 15-18, 2018
- Ashraf Haque, Jaryn Vaile, Tony Rutkunas, Sameh Kodsi, Ashikur Bhuiya, and Robert Baker, “Geomagnetic Disturbance Storm System Impact – A Transmission Facility Owner Case Study” accepted for presentation at the 2017 IEEE PES General Meeting, July 16–20, 2017, Chicago Illinois, USA
- Ashraf Haque, Paras Mandal, Ashikur Bhuiya, Robert Baker, and T. Bill, “Suppressing Wind Farm Output Power Fluctuation and Improving Power System Stability using Battery Energy Storage Systems” 2016 CIGRE Canada Conference, Vancouver, BC, Canada, October 17-19, 2016
- Ashraf UI Haque, Ashikur Bhuiya, and Robert Baker, “Role of Wind Power as an Ancillary Services Provider in Alberta’s Energy Only Deregulated Market Environment” Renewable Energy World International 2016 Conference, December 13-15, 2016 Orlando Florida
- Ashraf UI Haque, Paras Mandal, Hashem Nehrir, Ashikur Bhuiya, and Robert Baker, “A Hybrid Intelligent Framework for Wind Power Forecasting Engine” IEEE EPEC 2014, Calgary, AB, Canada, November 12-14, 2014
- Bhuiya, M. Wu, R. Baker, “Prospective Reconciliation of Transmission Loss Cost in Alberta”, IEEE Transactions on Power Systems, November 2009