



NPCC, Inc.

NORTHEAST POWER COORDINATING COUNCIL, INC.
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|--------------------------------|--|-------------------------------|----------------------|
| NCR ID : | NBCR001 | | |
| Registered Entity Name: | New Brunswick Power Corporation | | |
| Registered Entity Acronym: | NB Power | | |
| Reliability Standards Scope: | Operations & Planning Standards | | |
| Compliance Monitoring Process: | Compliance Audit | | |
| Distribution: | Public Version. Confidential Information Has Been Removed, Including Privileged and Critical Energy Infrastructure Information. | | |
| Regional Entity: | Northeast Power Coordinating Council, Inc. (NPCC) | | |
| Date of Opening Presentation: | July 11, 2017 | Date of Closing Presentation: | July 12, 2017 |
| Date of Report: | 7/24/2017 | IP Year: | 2017 |
| Potential Noncompliance: | None (zero) | | |
| Jurisdiction: | New Brunswick, Canada | | |

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I. Executive Summary

Northeast Power Coordinating Council (NPCC) is a recognized compliance body in New Brunswick and assists the New Brunswick Energy and Utilities Board (NBEUB) with compliance monitoring functions in the Province.

Northeast Power Coordinating Council, Inc. (NPCC) conducted a Operations & Planning Standards Compliance Audit of 2017 (NB Power), NCR ID NBCR001 from July 11, 2017 to July 12, 2017.

At the time of the Compliance Audit, NB Power was registered for the functions of Balancing Authority (BA), Distribution Provider (DP), Generator Operator (GOP), Generator Owner (GO), Interchange Authority (IA), Load-Serving Entity (LSE), Planning Authority (PA), Purchasing-Selling Entity (PSE), Reliability Coordinator (RC), Reserve Sharing Group (RSG), Resource Planner (RP), Transmission Operator (TOP), Transmission Owner (TO), Transmission Planner (TP), and Transmission Service Provider (TSP).

The Compliance Audit team “team” evaluated NB Power for compliance with thirty-four (34) requirements for the New Brunswick Compliance Monitoring and Enforcement Program (NB CMEP) 2017 Annual Implementation Plan (AIP). The team assessed compliance with the NBEUB Approved NERC Reliability Standards for the period of **May 14, 2014 to July 12, 2017**.

NB Power submitted evidence for the team’s evaluation of compliance with requirements. The team reviewed and evaluated all evidence provided to assess compliance with Reliability Standards applicable to NB Power at this time.

Based on the evidence provided, no findings of non-compliance were noted for the Reliability Standards and applicable Requirements in scope for this engagement.

The Compliance Audit Team Lead certifies that the team adhered to all applicable requirements of the New Brunswick the Reliability Standards Regulation, NERC Rules of Procedure (ROP) and Compliance Monitoring and Enforcement Program (CMEP).

II. Compliance Audit Process

The compliance Compliance Audit process steps are detailed in the Reliability Standards Regulation which is based on the NERC ROP and CMEP and generally conforms to the United States Government Auditing Standards and other generally accepted audit practices.

Objectives

All registered entities are subject to compliance assessments with all Reliability Standards applicable to the functions for which the registered entity is registered in the Region(s) performing the assessment. The Compliance Audit objectives are to:

- Provide reasonable assurance of compliance to the identified applicable Reliability Standards;
- Review compliance with applicable NBEUB approved NERC Reliability Standards identified in the 2017 NB Annual Implementation Plan list of actively monitored standards and additional NBEUB approved NERC Reliability Standards selected by NPCC and the NBEUB;
- Review evidence of self-reported violations;
- Review NB Power's internal compliance program and controls;
- Review the status of open Mitigation Plans.

Scope

The scope of this Compliance Audit considered the NBEUB approved NERC Reliability Standards from the 2017 NB Annual Implementation Plan, Inherent Risk Assessment (IRA) and Internal Control Evaluation (ICE) of NB Power completed by Northeast Power Coordinating Council, Inc. (NPCC).

The Reliability Standards and Requirements in-scope for this Compliance Audit are illustrated in **Table 1** below:

| Registered Function | Standards | Requirement(s) |
|---------------------|-----------------|--------------------------------|
| BA | BAL-002-1 | R1, R3 |
| BA, RC, TOP | COM-002-4 | R2 |
| BA, TOP | EOP-001-2.1b | R3 |
| BA | EOP-002-3.1 | R4 |
| BA, TOP | EOP-003-2 | R5 |
| RC | EOP-006-2 | R1 |
| RC | EOP-008-1 | R3 |
| RC | FAC-014-2 | R1, R5 |
| RC | IRO-002-2 | R1, R2, R3, R4, R5, R6, R7, R8 |
| RC | IRO-005-3.1a | R1, R12 |
| RC | IRO-008-1 | R1, R2 |
| RC | IRO-009-2 | R2 |
| BA, RC, TOP | PER-005-2 | R1, R4 |
| TOP | PRC-001-1.1(ii) | R3, R4, R5 |
| TOP | TOP-004-2 | R1, R2 |
| BA, RC, TOP | TOP-006-2 | R2 |
| RC, TOP | TOP-007-0 | R2, R3, R4 |

The team did not expand the scope of the Compliance Audit beyond what was stated in the notification package.

Internal Compliance Program

Within the scope of the Compliance Audit, NB Power's compliance program was reviewed.

Controls

As part of the audit activities, the team reviewed NB Power's related internal controls associated with NERC Reliability Standards in scope. In March of 2017, NB Power participated in the NPCC ICE program.

Confidentiality and Conflict of Interest

Confidentiality and conflict of interest of the team are governed under the Reliability Standards Regulation, the NBEUB-NPCC Service Contract, the NPCC Delegation Agreement with NERC and Section 1500 of the NERC Rules of Procedure. NB Power was informed of Northeast Power Coordinating Council, Inc. (NPCC)'s obligations and responsibilities under the agreement and procedures. The work history for each team member was provided to NB Power, which was given an opportunity to object to a team member's participation on the basis of a possible conflict of interest or the existence of other circumstances that could interfere with a team member's impartial performance of duties. NB Power had not submitted any objections by the stated objection due date based on the Reliability Standards Regulation and accepted the team member participants without objection. There were no denials or access limitations placed upon this team by NB Power.

Methodology

The ERO Compliance Monitoring and Enforcement Manual (Manual)¹ documents the ERO Enterprise's current approaches used to assess a registered entity's compliance with the NERC Reliability Standards. The ERO Enterprise uses, "to the extent possible, the Generally Accepted Auditing Standards (GAAS), the Generally Accepted Government Auditing Standards (GAGAS), and standards sanctioned by the Institute of Internal Auditors, as guidance for performing activities under the Compliance Monitoring and Enforcement Program (CMEP)."² While the ERO Enterprise does not necessarily perform compliance monitoring activities that must be in accordance with these standards recognized in the United States, the ERO Enterprise uses these standards as framework to conduct compliance monitoring activities under the NB CMEP, and recognizes that these standards provide information used in oversight, accountability, transparency, and improvements in ERO Enterprise operations.

The Northeast Power Coordinating Council, Inc. (NPCC) coordinated with the New Brunswick Energy and Utilities Board (EUB) to develop and provide NB Power with a Compliance Audit notification package to commence the Compliance Audit. NB Power provided evidence at the time requested, or as agreed upon, by Northeast Power Coordinating Council, Inc. (NPCC). The team reviewed the evidence submitted by NB Power and assessed compliance with the requirements of the applicable Reliability Standards. Additional evidence could be submitted until the agreed-upon deadline prior to the exit briefing. After that date, only data or information that was relevant to the content of the report or its finding could be submitted with the agreement of the team lead.

¹http://www.nerc.com/pa/comp/ERO%20Enterprise%20Compliance%20Auditor%20Manual%20DL/NERC_Compliance_Monitoring_and_Enforcement_Manual_v3_0.pdf

²NERC Rules of Procedure, Section 1207 and 126 FERC 61,038, Paragraph 3

The team reviewed documentation provided by NB Power and requested additional evidence and sought clarification from subject matter experts during the Compliance Audit. The evidence submitted in the form of policies, procedures, emails, logs, studies, data sheets, etc. were validated, substantiated, and cross-checked for accuracy as appropriate. Where sampling is applicable to a requirement, the sample set was determined by a statistical methodology, along with professional judgment as mentioned in the Manual.

The findings were based on the facts and documentation reviewed, the team's knowledge of the Bulk Electric System (BES), the NERC Reliability Standards, and professional judgment. All findings were developed based upon the consensus of the team.

Company Profile

New Brunswick Power Corporation (NBPC) is a vertically integrated Crown corporation with a board of directors responsible for the administration of the business and affairs of the corporation as described in the NB Electricity Act.

In addition, New Brunswick Energy Marketing Corporation ("Energy Marketing") a wholly owned subsidiary of NB Power is responsible for the wholesale merchant function. Energy Marketing maintains the licenses and permits necessary to allow Energy Marketing to carry out its mandate to import and export energy and certain contracts related to that mandate.

New Brunswick Power Corporation (NBPC)

NBPC is located in the province of New Brunswick. NBPC owns and operates 12 generating facilities to serve 3,060 MW (2016 winter peak) of internal load. NBPC owns and operates nearly all of the transmission and distribution system to serve an estimated 394,000 customers within the province. The NBPC subsidiary called New Brunswick Energy Marketing facilitates all energy transactions with our adjacent interfaces including New England, Quebec, Northern Maine, Nova Scotia and Prince Edward Island.

NBPC is broken down into the following divisions:

NB Power Corporate provides strategic direction, governance and support to the divisions for communications, finance, human resources, legal and governance.

Distribution and Customer Service is designated as the standard supplier, responsible for securing adequate capacity and energy to meet our customers' needs in New Brunswick. The distribution system consists of 178 substations which are connected by 20,815 km of distribution lines operating at a system voltage of 12.47 kV. The distribution system supplies approximately 72% of the in province load where the remaining 28% are industrial customers directly connected to the transmission system.

Generation operates 11 plants in New Brunswick with an installed net capacity of 2,853 MW which is broken down to 1,439 MW of thermal, 889 MW of hydro and 525 MW of combustion turbine. Generation supplies approximately 75 per cent of in province load.

Nuclear operates and maintains one CANDU 6 - 705 MW reactor at the Point Lepreau Generating Station (PLGS). The plant provides approximately 25 per cent of New Brunswick 's electrical energy requirements.

The **Transmission & System Operator** division maintains and operates 49 terminals that are interconnected by over 6,849 km of transmission lines with system voltages of 69 kV, 138kV, 230kV and 345 kV. The New England

interface consists of two 345kV lines which electrically connect New Brunswick to the Eastern Interconnection. New Brunswick is also synchronously connected to a portion of Northern Maine, Nova Scotia and Prince Edward Island. The Quebec interface consists of two HVDC stations which provide an asynchronous connection.

Geographic Footprint

The footprint of the Maritimes Reliability Coordinator Area (the “Maritimes Area”) is located on the Atlantic coast of Canada. It consists of the three Canadian Maritime Provinces of New Brunswick, Nova Scotia and Prince Edward Island as well as small portions of the United States in the State of Maine that are radially connected to New Brunswick. These small utilities in the Aroostook and Washington counties of Maine have a market which is collectively managed by the Northern Maine Independent System Administrator (NMISA).

The Transmission and System Operator Energy Control Centre in Fredericton, NB is the location from which RC, BA and TOP activities are carried out. The Nova Scotia Power Incorporated (NSPI) Ragged Lake control centre in Halifax, NS is the location from which the NSPI BA and TOP activities are carried out. The non-Bulk Power System transmission and generation resources in Prince Edward Island are operated locally by the Maritime Electric Company Limited (MECL) control centre in Charlottetown, PEI and those in northern Maine are operated by Maine Public Service Company Limited (MPS) in Presque Isle, ME and by Eastern Maine Electrical Cooperative (EMEC) in Calais, ME.

Technical Details

The combined all-time peak load for the entire Maritimes Area was 5,716 MW on January 16, 2004, of which 3,300 MW was in New Brunswick.

The Maritimes Area is synchronously connected to the Eastern Interconnection by two 345 kV transmission lines:

- 1) a 150-mile 345 kV transmission line connecting Keswick, NB to Keene Road, ME
- 2) a second 145-mile 345 kV transmission line (145 miles) connecting Point Lepreau, NB to Orrington, ME

Both lines connect to the Independent System Operator-New England (ISO-NE) reliability coordinator area.

The Maritimes Area is also asynchronously connected to the Hydro-Quebec/TransEnergie reliability coordinator area by two back-to-back HVDC stations located near the border between the Provinces of New Brunswick and Quebec.

Within the Maritimes Area, New Brunswick serves as the hub for interconnections between the various operating entities. NSPI is connected by one 345 kV and two 138 kV lines, NMISA by two 138 kV and three 69 kV lines while MECL is connected by two 138 kV submarine cables.

Regional Reliability Organization Affiliation

The Maritimes Area is part of the larger Northeast Power Coordinating Council (NPCC) region consisting of the electric power systems in New York, New England, Ontario, Quebec and the Maritimes.

Transmission voltages in the RC footprint include 345, 230, 138, 69 and 33 kV. Most of the bulk power transmission is at the higher voltage levels, of which there are 1220 miles of 345 kV (930 miles NB and 290 miles NS) and 1114 miles of 230 kV (388 miles NB and 776 miles NS).

III. Compliance Audit Findings

Based on the results of this Compliance Audit, no findings of non-compliance were noted for the Reliability Standards and applicable Requirements in scope for this engagement.

IV. Recommendations and Positive Observations

Recommendations

The team identified and informed NB Power of six (6) recommendations. The specific details of each recommendation are described below.

1. **General:**
Provide cross-training of the ENCO and PSO operating positions and provide common Areas of Responsibility access to all operating functions on the EMS. This would improve NB Power control room response to emergency operating incidents and would offer increased BES reliability.
2. **PER-005-2:**
Ensure that all operators are re-certified in a timely manner..
3. **PER-005-2:**
Evaluate and document the effectiveness of the training program annually
4. **PER-005-2:**
Incorporate IROL training using the simulator.
5. **IRO-008-1, R2:**
Independently calculate the Nova Scotia Onslow Import and Cape Breton Export IROL limits.
6. **TOP-004-2, R1:**
Implement a method to track the elapsed time of IROL exceedances.

Positive Observations

The team identified and informed NB Power of four (4) positive observations. The specific details of each positive observation are described below.

1. Key personnel for Compliance are identified by Standard and Requirement.
2. Prior Audit recommendations were implemented.
3. Operating Procedures are managed on Sharepoint and available on the EMS.
4. 3-Part communications are monitored weekly.

V. Compliance Culture

The team performed an assessment of NB Power's compliance culture in conjunction with the Compliance Audit process. The assessment was accomplished through a review of responses to the Internal Compliance Survey questionnaire and additional information that was gathered during interviews and observations. This included an assessment of factors that characterize vigorous and effective compliance programs including:

- Active engagement and leadership by senior management;
- Effective, in-practice preventive measures appropriate to the circumstances of the company;
- Prompt detection of problems, cessation of misconduct, and reporting of a violation; and
- Remediation of the misconduct.
- Volunteered to participation in the ICE process.

Northeast Power Coordinating Council, Inc. (NPCC) Contact Information

Any questions regarding this Compliance Audit report can be directed to:

Northeast Power Coordinating Council, Inc. (NPCC)
1040 Avenue of the Americas
10th Floor
New York, NY 10018-3703

On behalf of Northeast Power Coordinating Council, Inc. (NPCC), this report was prepared and reviewed by:

| Compliance Audit Team Lead | Date |
|-----------------------------------|-------------|
| John Muir | 8/22/2017 |
| Management Representative | Date |
| Scott Nied | 7/24/17 |

Appendix 1

Compliance Audit Participants

Following is a list of all personnel from the team and NB Power who were directly involved during the meetings and interviews.

| Role | Title | Entity |
|----------------------------|---|--------|
| Compliance Audit Team Lead | Manager – Compliance Monitoring | NPCC |
| Team Member | Manager - Operations & Planning Compliance Audits | NPCC |
| Team Member | Auditor | NPCC |
| Team Member | Auditor | NPCC |
| Team Member | Auditor | NPCC |
| Team Member | Auditor | NPCC |
| Team Member | Auditor | NPCC |
| Team Member | Auditor | NPCC |
| Observer | Auditor in training | NPCC |
| Observer | Auditor in training | NPCC |
| Observer | Auditor in training | NPCC |
| Observer | Compliance & Enforcement Coordinator | NBEUB |

| Title | Entity |
|---|----------|
| Director Corporate Compliance | NB Power |
| Corporate Compliance Engineer | NB Power |
| Director Energy Control Center | NB Power |
| Manager Transmission and Distribution Control Rooms | NB Power |
| Transmission Control Room Supervisor | NB Power |
| Senior System Operator | NB Power |
| Senior System Operator | NB Power |
| Senior System Operator | NB Power |
| Senior System Operator | NB Power |
| Power System Operator | NB Power |
| Energy Coordinator | NB Power |
| Lead Operations Engineer | NB Power |
| Senior Operations Engineer | NB Power |
| Senior Operations Engineer | NB Power |
| Operations Engineer | NB Power |
| Operations Engineer | NB Power |
| Operations Engineer | NB Power |
| Operations Engineer | NB Power |
| Operations Engineer | NB Power |
| Communications Engineer | NB Power |