



NORTHEAST POWER COORDINATING COUNCIL, INC.  
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# **Operations and Planning Compliance Audit Report Public Version**

**New Brunswick Power Corporation**  
NBCR001 [NERC NCR07155]

**Confidential Information (Including Privileged and Critical Energy  
Infrastructure Information) Has Been Removed**

**Date of Audit: June 16, 2014 to October 29, 2014**

**Audit Period:**

**September 16, 2011 (BA, RC, TOP) to June 30, 2014**

**October 18, 2008 (IA, PA, RP, RSG, TSP) to June 30, 2014**

**October 1, 2013 (TO, TP) to June 30, 2014**

**Date of Report: October 29, 2014**

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## Executive Summary

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

NPCC conducted an Operations and Planning Audit of New Brunswick Power Corporation (NB Power), from June 16, 2014 to October 29, 2014. This audit was performed in two sessions: Onsite from June 16 to June 20, 2014 and Offsite from June 30 to October 29, 2014 (Exit Briefing Date). At the time of the Audit, NB Power was registered with the EUB for the functions of Balancing Authority (BA), Distribution Provider (DP), Generator Owner (GO), Generator Operator (GOP), 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 table below identifies key Functions performed by NB Power:

Functional Model Interface	Registered Entity ID
Reliability Coordinator (RC)	NBCR001[NERC 07155]
Balancing Authority (BA)	NBCR001[NERC 07155]
Transmission Operator (TOP)	NBCR001[NERC 07155]
Planning Coordinator (PC)	NBCR001[NERC 07155]
Transmission Planner (TP)	NBCR001[NERC 07155]
Resource Planner (RP)	NBCR001[NERC 07155]

The Audit team evaluated NB Power for compliance with 138 requirements from the 2014 NB Annual Implementation Plan. The team assessed compliance with the NERC Reliability Standards (and Regional Reliability Standards if applicable), for the periods for the BA, RC, and TOP functions – Sept 16, 2011 (one day after last audit of these functions) to June 30, 2014 (final data submittal date), for the IA, PA, RP, RSG and TSP functions - Oct 18, 2008 (one day after last audit of these functions) to June 30, 2014, for the TO and TP functions – Oct 1, 2013 (date NB Power TO,TP functions were transferred to EUB compliance program) to June 30, 2014. Per NPCC Auditor review of Compliance history, NB Power had previously self-reported a violation of MOD-008 which had been fully mitigated in August 2013. Based upon documentation review, the audit period for MOD-008 is from August 15, 2013 (day after completed Mitigation Plan) to June 30, 2014 (final data submittal date). 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, the team's findings are summarized in Table 1 below:

**Table 1. Summary of Findings**

	No Finding	Possible Violation	Open Enforcement Action*	Not Applicable	Total
Reliability Standard Requirements	119	10	0	9	138

\*OEA's with newly identified PVs are counted in the PV column only; not in the OEA column. OEA's without newly identified PVs are counted in the OEA column.

The team notified NB Power of two (2) Areas of Concern and four (4) Recommendations.

The findings included in this report are the same as the findings presented to NB Power during the exit briefing. The findings are further explained in the Audit Findings section and the Findings table of the report. The Findings table includes information of the team's findings of applicability and compliance to the NERC Reliability Standards (and Regional Reliability Standards if applicable) within the scope of the Audit. Possible Violations will be processed in accordance with the NB Reliability Standards Regulation-Electricity Act (Reliability Standards Regulation). There were no open mitigation plans; therefore, none were reviewed by the team.

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

## Audit Process

The 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 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 as per the Reliability Standards Regulation. The Audit objectives are to:

- Review compliance with the requirements of reliability standards that are applicable to NB Power, based on the functions that NB Power is registered to perform;
- Validate compliance with applicable reliability standards from the 2014 NB Annual Implementation Plan list of actively monitored standards and additional NERC Reliability Standards selected by NPCC and the EUB;
- Validate compliance with applicable Regional Reliability Standards from the 2014 NB Annual Implementation Plan list of actively monitored standards, if applicable;

- Validate evidence of self-reported violations and previous self-certifications;
- Observe and document NB Power's compliance program and culture;
- Review the status of open mitigation plans.

## Scope

The scope of the compliance Audit included the NERC Reliability Standards from the 2014 NB Annual Implementation Plan. The team did expand the scope beyond what was stated in the notification package. The scope of the audit was expanded to include FAC-011 as it was noted by the entity as an area of a Possible Violation.

## Confidentiality and Conflict of Interest

Confidentiality and conflict of interest of the Audit team are governed under the Reliability Standards Regulation, the EUB-NPCC Service Contract, the NPCC Delegation Agreement with NERC and Section 1500 of the NERC Rules of Procedure. NB Power was informed of NPCC's obligations and responsibilities relating to confidentiality and conflict of interest under these governing documents. 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 15-day objection due date and accepted the team member participants without objection. There were no denials or access limitations placed upon this team by NB Power.

## Methodology

This audit was performed in two sessions: Onsite from June 16 to June 20, 2014 to maximize interviews and face-to-face interaction between NB Power Subject Matter Experts (SMEs) and NPCC Auditors; and Offsite from June 30 to October 29, 2014 (Exit Briefing Date) for the standards/requirements that did not require as much interaction with NB Power SMEs. The Onsite session was performed by the entire NPCC Audit Team on the standards and requirements listed in Attachment 1 of the Audit Notification Letter. The Offsite session took place following the Onsite Audit Status presentation and was performed with part of the NPCC Audit team on the standards and requirements listed in Attachment 2 of the Audit Notification Letter.

The Audit team reviewed the evidence submitted by NB Power and assessed compliance with requirements of the applicable reliability standards. NPCC provided NB Power with a Request for Information (RFI) prior to commencement of the Audit. NB Power provided pre-Audit evidence at the time requested, or as agreed upon, by NPCC. 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 findings could be submitted with the agreement of the audit team lead.

The Audit team reviewed documentation provided by NB Power and requested additional evidence and sought clarification from subject matter experts during the Audit. 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 was applicable to a requirement, the sample set was determined by a statistical methodology, along with professional judgment.

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

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 NB Power’s T&SO Energy Control Centre in Fredericton is the location from which RC, BA and TOP activities are carried out.

The combined all-time peak load for the entire Maritimes Area exceeded 5700MW in 2004, of which >3,000 MW was in New Brunswick. The Maritimes Area is synchronously connected to the Eastern Interconnection by two 345 kV transmission lines: 1) a 345 kV transmission line connecting Keswick, NB to Keene Road, ME; 2) a second 345 kV transmission line connecting Point Lepreau, NB to Orrington, ME. Both lines connect to the 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 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. Nova Scotia Power Inc. (NSPI) is connected by one 345 kV and two 138 kV lines, NMISA by two 138 kV and three 69 kV lines while Maritime Electric Company Ltd (MECL) is connected by two 138 kV submarine cables.

Following is the installed generating capacity in New Brunswick:

Generating Capacity Oil (>1,500 MW), Coal (>450 MW), Natural Gas (>350 MW), Biomass (>35 MW), Hydro (>900 MW), Nuclear (>650 MW), Wind (>250 MW). 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.

## Audit Participants

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

### NPCC Team Members

Role	Title	Entity
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Audit Team Lead	Lead Auditor	NPCC
Audit Manager	Manager, Compliance Audits and Investigations, O&P	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
Team Member	Auditor	NPCC
Team Member	Manager	NPCC

## Observers

Role	Title	Entity
Regulatory Observer	Director-Reliability Standards, Compliance and Enforcement	NBEUB
Regulatory Observer	Compliance and Enforcement Coordinator	NBEUB
Regulatory Observer	Reliability Standard Coordinator	NBEUB

## NB Power Participants

Title	Entity
Director, Corporate Compliance	NB Power
Vice President, Corporate Services & CFO	NB Power
Executive Director, Transmission and System Operator	NB Power
Director, Compliance, Transmission and System Operator	NB Power
Senior Compliance Engineer, Corporate Compliance	NB Power
Senior Compliance Engineer	NB Power
Energy Coordinator	NB Power
Power System Operator	NB Power
Senior Transmission Planning Engineer	NB Power
Operations Engineer	NB Power
Operations and Compliance Specialist	

Director, Engineering	NB Power
Senior System Operator, Training	NB Power
Senior System Operator, Compliance and Standards	NB Power
Senior Relay, Protection and Controls Engineer	NB Power
Senior System Operator, Field and SCADA	NB Power
Transmission Operations Engineer	NB Power
Operations Engineer	NB Power
Director, IT Services	NB Power
SCADA Engineer	NB Power
Mgr. Vegetation and Environmental Support	NB Power
Engineer	NB Power
Senior System Operator, Resource Adequacy and OATT	NB Power
Senior Engineer, Engineering Services	NB Power
ECC System Specialist	NB Power
Senior High Voltage Apparatus Engineer	NB Power

## Audit Findings

The following information details the compliance findings for the reliability standards and requirements identified in the scope of this Audit.

Standard	Req.	Finding
BAL-002-1	R1.	No Finding
BAL-002-1	R2.	No Finding
BAL-002-1	R3.	No Finding
BAL-002-1	R4.	No Finding
BAL-005-0.2b	R6.	No Finding
BAL-005-0.2b	R7.	No Finding
CIP-001-2a	R1.	No Finding
CIP-001-2a	R2.	No Finding
CIP-001-2a	R3.	No Finding



CIP-001-2a	R4.	No Finding
COM-001-1.1	R1.	No Finding
COM-001-1.1	R2.	No Finding
COM-002-2	R2.	No Finding
EOP-002-3.1	R1.	No Finding
EOP-002-3.1	R4.	No Finding
EOP-002-3.1	R5.	No Finding
EOP-002-3.1	R7.	No Finding
EOP-003-2	R1.	No Finding
EOP-003-2	R3.	No Finding
EOP-003-2	R8.	No Finding
EOP-005-2	R1.	No Finding
EOP-005-2	R2.	No Finding
EOP-005-2	R4.	No Finding
EOP-005-2	R6.	<i>Possible Violation</i>
EOP-005-2	R9.	No Finding
EOP-005-2	R10.	No Finding
EOP-005-2	R11.	No Finding
EOP-005-2	R13.	No Finding
EOP-006-2	R1.	<i>No Finding</i>
EOP-006-2	R3.	<i>Possible Violation</i>
EOP-008-1	R3.	<i>No Finding</i>
EOP-008-1	R4.	No Finding
EOP-008-1	R6.	No Finding
EOP-008-1	R7.	No Finding
EOP-008-1	R8.	No Finding
FAC-001-0	R1.	No Finding

FAC-001-0	R2.	No Finding
FAC-002-1	R1.	No Finding
FAC-003-1	R1.	<i>Possible Violation</i>
FAC-003-1	R2.	<i>Possible Violation</i>
FAC-003-1	R3.	No Finding
FAC-008-3	R3.	No Finding
FAC-008-3	R6.	No Finding
FAC-008-3	R8.	No Finding
FAC-010-2.1	R1.	No Finding
FAC-010-2.1	R2.	No Finding
FAC-011-2	R1.	No Finding
FAC-011-2	R2.	No Finding
FAC-011-2	R3.	No Finding
FAC-011-2	R4.	No Finding
FAC-011-2	R5.	No Finding
FAC-014-2	R1.	No Finding
FAC-014-2	R2.	No Finding
FAC-014-2	R3.	No Finding
FAC-014-2	R4.	No Finding
FAC-014-2	R5.	No Finding
IRO-001-1.1	R3.	No Finding
IRO-001-1.1	R4.	N/A
IRO-001-1.1	R7.	No Finding
IRO-002-2	R2.	No Finding
IRO-002-2	R4.	No Finding
IRO-002-2	R5.	No Finding
IRO-002-2	R6.	<i>Possible Violation</i>

IRO-002-2	R7.	No Finding
IRO-002-2	R8.	No Finding
IRO-003-2	R1.	No Finding
IRO-003-2	R2.	No Finding
IRO-005-3.1a	R1.	<i>Possible Violation</i>
IRO-005-3.1a	R5.	No Finding
IRO-005-3.1a	R6.	No Finding
IRO-005-3.1a	R7.	No Finding
IRO-005-3.1a	R9.	No Finding
IRO-005-3.1a	R12.	No Finding
IRO-008-1	R1.	No Finding
IRO-008-1	R2.	No Finding
IRO-008-1	R3.	No Finding
IRO-009-1	R3.	No Finding
IRO-009-1	R4.	No Finding
IRO-009-1	R5.	No Finding
IRO-010-1a	R1.	No Finding
MOD-004-1	R1.	N/A
MOD-004-1	R4.	N/A
MOD-004-1	R5.	N/A
MOD-004-1	R6.	N/A
MOD-004-1	R8.	N/A
MOD-004-1	R10.	N/A
MOD-004-1	R11.	N/A
MOD-004-1	R12.	N/A
MOD-008-1	R1.	No Finding
MOD-008-1	R2.	No Finding

MOD-008-1	R4.	No Finding
NUC-001-2	R2.	No Finding
NUC-001-2	R3.	No Finding
NUC-001-2	R4.	No Finding
NUC-001-2	R6.	No Finding
NUC-001-2	R8.	No Finding
NUC-001-2	R9.	No Finding
PER-003-1	R1.	No Finding
PER-004-2	R1.	No Finding
PER-005-1	R1.	No Finding
PER-005-1	R2.	No Finding
PER-005-1	R3.	No Finding
PRC-001-1	R1.	No Finding
PRC-001-1	R4.	No Finding
PRC-001-1	R6.	No Finding
PRC-004-2a	R1.	No Finding
PRC-005-1b	R1.	<i>Possible Violation</i>
PRC-005-1b	R2.	No Finding
PRC-006-1	R1.	No Finding
PRC-006-1	R2.	No Finding
PRC-006-1	R9.	No Finding
PRC-006-1	R11.	No Finding
PRC-017-0	R1.	<i>Possible Violation</i>
PRC-017-0	R2.	No Finding
PRC-023-1	R1.	<i>Possible Violation</i>
PRC-023-1	R3.	No Finding
PRC-023-2	R1.	<i>Possible Violation</i>
PRC-023-2	R2.	No Finding

PRC-023-2	R6.	No Finding
TOP-001-1a	R2.	No Finding
TOP-002-2.1b	R4.	No Finding
TOP-002-2.1b	R5.	No Finding
TOP-002-2.1b	R6.	No Finding
TOP-002-2.1b	R7.	No Finding
TOP-002-2.1b	R10.	No Finding
TOP-002-2.1b	R11.	No Finding
TOP-002-2.1b	R12.	No Finding
TOP-002-2.1b	R19.	No Finding
TOP-004-2	R1.	No Finding
TOP-004-2	R2.	No Finding
TOP-004-2	R6.	No Finding
TOP-008-1	R1.	No Finding
TOP-008-1	R2.	No Finding
TPL-003-0b	R1.	No Finding
TPL-003-0b	R2.	No Finding
VAR-001-3	R1.	No Finding
VAR-001-3	R2.	No Finding
VAR-001-3	R4.	No Finding

## Recommendations

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The Audit team identified and informed NB Power of four (4) Recommendations. The specific details of each Recommendation are described below.

1. State Estimation/Contingency Analysis programs should be resourced to be brought into service ASAP.

2. Review the overall IVMP program and documentation and make improvements to address auditors' questions and data requests.
3. **IRO-010-1a R1** - Consider consolidating existing documents into a single document that specifically addresses, from an EMS/SCADA perspective, a specification for data and information required to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its RC Area.
4. **EOP-003-2 R1** Load Shedding Drills - Load Shedding Drills should be conducted at least annually to demonstrate capability to shed a designated load amount in an expected timeframe.

## Compliance Culture

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

- NPCC agrees that NB Power is structured properly for a good culture of compliance.
- The amalgamation of the NB System Operator into NB Power, integration and revision of procedures presented challenges to the organization in preparation for the audit.
- NB Power does prompt detection of problems and reporting of potential violations
- NB Power is willing to make improvements to enhance reliability of the BES.
- NB Power should continue implementation of their Compliance Program and internal controls throughout the amalgamated organization to ensure that their Subject Matter Experts have a clear understanding of the NERC Reliability Requirements, and the NBPower policies, procedures, actions, documentation needed to demonstrate compliance to them. [A presentation by NBPower was provided on Day 1 at the onsite audit to this effect].