



NORTHEAST POWER COORDINATING COUNCIL, INC.
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March 12, 2019

Members, Reliability Coordinating Committee
and
Members, Task Force on Coordination of Operation
Members, Task Force on Coordination of Planning
Members, Task Force on Infrastructure Security and Technology
Members, Task Force on System Protection
Members, Task Force on System Studies

Re: Minutes of the December 4, 2018 RCC Meeting

Sir / Madam:

Attached is the Minutes of the December 4, 2018 meeting of the NPCC Reliability Coordinating Committee, as approved at the December 4, 2018 RCC meeting.

Sincerely,

Phil Fedora

Philip A. Fedora
Assistant Vice President - Reliability Services

cc: NPCC Staff



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Reliability Coordinating Committee Minutes
December 4, 2018

Mr. Evans-Mongeon called the meeting of the Reliability Coordinating Committee (RCC), held at the Westin Prince Hotel, Toronto, Ontario to order at 8:30 am.

Attendance

Officers of the Reliability Coordinating Committee

Brian Evans-Mongeon, Chair	Utility Services, Inc.
Randy Crissman, Co-Vice Chair	New York Power Authority
Dave Conroy, Co-Vice Chair	Central Maine Power Company

Sector 1 - Transmission Owners

Central Hudson Gas & Electric Corporation	Frank Pace (via phone)
Central Maine Power Company	David Conroy
Consolidated Edison Company of New York, Inc.	Mike Forte
Eversource Energy	Martin Paszek – Alternate (via phone)
Hydro-One, Inc.	George Wegh
Long Island Power Authority	Tom Irvine
National Grid USA	Anie Philip (via phone)
New York Power Authority	Brian Hayduk
New York State Electric & Gas Corp.	(proxy to Randy Crissman)
Nova Scotia Power, Inc.	(proxy to Dave Conroy)
Rochester Gas & Electric Corporation	Joy Brake - Alternate
The United Illuminating Company	(proxy to Dave Conroy)
Vermont Electric Power Company, Inc.	David Bradt
	Hantz Presume

Sector 2 – Reliability Coordinators

Hydro-Quebec TransEnergie	Stephane Desbiens - Alternate
ISO New England, Inc.	Michael Henderson
	Rich Kowalski – Alternate
New Brunswick Power Corporation	(proxy to Randy MacDonald)
New York ISO	(proxy to Kevin DePugh – via phone)
Ontario IESO	Gabriel Adam

Sector 3 – Transmission Dependent Utilities, Distribution Companies and Load Serving

Entities

Eversource Energy	Barry Bruun
Hydro-Quebec Distribution	(proxy to Sylvie Gicquel – via phone)
Long Island Power Authority	(proxy to Anie Philip – via phone)
New York Power Authority	(proxy to Randy Crissman)
New Brunswick Power Corporation	Randy MacDonald

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Sector 4 Generation Owners

Consolidated Edison Company of New York, Inc.	Peter Yost
Dominion Resources Services, Inc.	Sean Bodkin
Long Island Power Authority	(proxy to Anie Philip – via phone)
New York Power Authority	Randy Crissman
NextEra Energy Resources	Allen Schriver (via phone)

Sector 5 – Marketers, Brokers, and Aggregators

Long Island Power Authority	(proxy to Anie Philip – via phone)
New York Power Authority	Jenny Liu
Utility Services, Inc.	Brian Evans-Mongeon

Sector 6 – State and Provincial Regulatory and/or Governmental Authorities

Long Island Power Authority	(proxy to Anie Philip – via phone)
New York Power Authority	(proxy to Randy Crissman)
New York State Department of Public Service	Humayun Kabir – Alternate (via phone)

Sector 7 – Sub-Regional Reliability Councils, Customers, other Regional Entities and Interested Entities

New York State Reliability Council, LLC	Roger Clayton
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NPCC Staff

Sal Buffamante	Assistant Vice President, Compliance
Gerry Dunbar	Manager of Reliability Criteria Requirements
Phil Fedora	Assistant Vice President, Reliability Services
Brian Hogue	Information Systems & Security Management
Andreas Klaube	Senior Engineer, Operations
Neeraj Lal	Senior Reliability Assessment & Performance Analysis Engineer
Quoc Le	Manager, System Planning and Protection
Michael Lombardi	Manager, System Studies
Scott Nied	Director, Mitigation
Andrey Oks	Director of Operations Coordination
Paul Roman	Director, Operations Planning
Rafael Sahiholamal	Senior Reliability Engineer
Rui Da Shu	Senior Engineer, Reliability Standards
Edward Schwerdt	President & CEO



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Guests

Dennis Bergeron	Maine Public Utilities Commission
Joel Charlebois	AESI
Mike Cook	Ontario Power Generation, Inc.
Alessia Dawes	Chair, CP-11 Working Group
Patrick Doyle	Chair, Task Force on Coordination of Operation
Alex Echevarria	Chair, Task Force on System Protection
Jeffery Fenn	SGC Engineering
Chris Kirby	Nalcor Energy
Nicholas Kowalczyk	Orange & Rockland Utilities
Anna Lafoyiannis	Ontario IESO
Dean Latulipe	Chair, SS-38 Working Group
Jennifer Li	Hydro One, Inc.
Laura Popa (via phone)	New York ISO
Bendong Sun	Bruce Power
Dan Schwarting (via phone)	Vice Chair, CP-11 Working Group
Vithy Vithyanathan (via phone)	Ontario IESO
Guy Zito	Assistant Vice President of Standards

Quorum Statement

Mr. Fedora indicated that a quorum had been achieved, by member attendance, proxy, or alternate designation.

Antitrust Guidelines for NPCC Meetings

A motion made and seconded to waive the reading of the NPCC Antitrust Compliance Guidelines unanimously passed.

President & CEO Report

Assessing Risks to Reliability

Mr. Schwerdt reported that during 2018, NPCC, through the dedicated work of the RCC, its Task Forces and Working Groups, has been addressing a number of Regionally-specific existing risks to reliability, including: targeted efforts to reduce protection system misoperations; efforts to lessen event severity; and, enhancements for more accurate modeling of distributed energy resources (DER). In addition, NPCC has worked to identify and assess several emerging risks that could affect Northeastern North America, such as: risks to resource adequacy due to accelerated retirement of traditional generation resources; severe disruptions of the natural gas distribution system; and, the correlation between the availability of distributed energy resources and load levels.



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These assessments of reliability risks represent a continuation of NPCC's ongoing commitment to Regional reliability assurance, and these efforts are supported by a strong foundation of reliability standards; Regionally specific, more-stringent criteria; compliance monitoring that focuses on reliability enhancing mitigating actions; regular Area-wide reviews of both resource adequacy and transmission reliability; seasonal assessments; and long-range reliability and adequacy overviews, which are on today's Agenda.

Of special note is the work of the CP-11 Working Group to enhance the testing approach and improve the consistency of application of the NPCC A-10 methodology used to identify the most critical facilities through consideration of alternate methodologies against an objective set of criteria to judge the results of that testing. In parallel with that effort, and at the direction of the NPCC Board, a high-level strategic review of the need for NPCC's Regionally-specific reliability criteria was conducted. That review identified overarching reliability benefits of imposing more-stringent requirements on Full NPCC members within the major focus areas of planning; operations; and system protection and has recommended follow-up reviews of the NPCC Directories to identify specific reliability requirements and benefits and evaluate the cost effectiveness of those requirements.

Collaborative NERC & NPCC Analytical Initiatives

Working collaboratively within the Operating Plan of the ERO Enterprise (NERC and the seven Regional Entities), NPCC has conducted numerous key contributing activities to the continuing assurance of the international, interconnected Bulk Power System reliability within North America. NPCC's recent analysis of the impacts of gas supply disruptions to the Northeast, and the assessment of the effects of accelerated retirements of baseload generating units are two examples of more regionally focused follow-up activities to NERC's industry-wide reliability assessments. Conversely, NPCC's industry leading work on relay mis-operations and its preliminary considerations regarding guidelines for incorporating distributed energy resources into planning studies have helped spark NERC level initiatives.

Future collaborative efforts within the ERO Enterprise could include: advanced analytics and reliability trending analysis utilizing the GADS, TADS, DADS, TEAMS and MIDAS data bases; the development of guidelines for system resilience; as well as metrics regarding the time it takes each interconnection to recover from generator loss events, as measured by Area Control Error (ACE), and the change in frequency and elapsed time from the initial disturbance to a frequency minimum. These and other reliability challenges and assessment opportunities await NPCC and the RCC in 2019.



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Chair Report

Agenda

Mr. Evans-Mongeon noted this was his last RCC as Chair; Mr. Crissman succeeds him as RCC Chair in 2019. He expressed his thanks to Mr. Schwerdt and the NPCC staff for all the support he received during his tenure as Chair, he stated it has been an honor and a pleasure working with everyone.

Mr. Evans-Mongeon then reviewed the Agenda provided in the Agenda package; no changes were made. He noted that specific Informational Items in the Agenda package would not be covered in the meeting today, unless specially requested. No requests were made to discuss the Informational Items.

The RCC then approved the Agenda provided in the Agenda package.

2019-2020 RCC Work Plan

Mr. Evans-Mongeon reminded the RCC that the review and approval of the proposed 2019-2020 RCC Work Plan will take place following the RCC's approval of the proposed NPCC Task Force 2019 – 2020 Work Plans later in that meeting.

RCC Nominating Committee Report

Mr. Evans-Mongeon referred the RCC to the recommendation of the Nominating Committee formed at the last RCC meeting for the position of the new 2019 RCC Co-Vice Chair (provided in the Agenda package). The Nominating Committee report outlines the two candidate's qualifications and verifies that, according to the *Amended and Restated Bylaws of Northeast Power Coordinating Council, Inc.* (Section VI – 6.1(c), page (2)) that the Co-Vice Chairs are from different voting sectors.

Mr. Fedora indicated an e-mail/paper ballot vote by the RCC members would be conducted later in the meeting.

November 15, 2018 A-10 Methodology WebEx

Mr. Evans-Mongeon mentioned that a Webinar (presentation included in the Agenda package) was held on November 15, 2018 to provide RCC Members an opportunity to review the Task Force on Coordination of Planning's A-10 methodology recommendations in preparation for the today's meeting.

He then recognized and commended the efforts of Ms. Dawes, Messers Dunbar and Schwarting, the work of the CP-11 Working Group, and the Task Force on Coordination of Planning over the last two years resulting in bringing their final report for RCC consideration at today's meeting.



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RCC Scope

Mr. Evans-Mongeon noted that consideration of the updated RCC Scope is part of the consent Agenda.

2019 RCC Roster

Mr. Fedora referred the RCC to the 2019 RCC Roster provided in the Agenda package, and indicated revisions received at the meeting will be incorporated. The 2019 RCC Roster will be acknowledged at the 2018 NPCC Annual Meeting of the Members at their December 5, 2018 meeting. Mr. Evans-Mongeon asked the RCC Members to coordinate any future changes to the RCC Roster with Mr. Fedora.

2019 RCC Meeting Locations & Dates

Mr. Fedora confirmed the following dates and locations for the 2019 RCC meetings:

- ✓ Wednesday February 27, 2019 - New York Times Square Residence Inn by the Marriott, NYC
- ✓ Wednesday May 29, 2019 - New York Times Square Residence Inn by the Marriott, NYC
- ✓ Wednesday September 4, 2019 - New York Times Square Residence Inn by the Marriott, NYC
- ✓ Tuesday December 3, 2019 - Montreal Marriott Chateau Champlain, Montreal, Quebec
(in conjunction with the NPCC 2019 Board/Annual/General Meetings)

Consent Agenda

The Reliability Coordinating Committee unanimously approved the following Consent Agenda items:

September 5, 2018 Meeting Minutes

The Draft-For-Approval Minutes of the September 5, 2018 Reliability Coordinating Committee were approved, with the changes as noted at the meeting.

RCC Membership Changes

The following changes to RCC Membership were approved:

Sector 1 - Transmission Owners

- ✓ Nicholas Kowalczyk as a representative of Orange & Rockland Utilities.
- ✓ Anie Philip succeeds Curt Dahl as representative for the Long island Power Authority.
- ✓ Nicholas Culpepper succeeds Anie Philip as alternate for the Long Island Power Authority.

Sector 2 - Reliability Coordinators

- ✓ Kevin DePugh as alternate for the New York ISO.
- ✓ Dave Robitaille succeeds Nicolas Ingman as alternate for the Ontario IESO.

Sector 4 - Generator Owners

- ✓ Michael Cooke succeeds David Ramkalawan as representative for Ontario Power Generation.
- ✓ Constantin Chitescu as secondary alternate for Ontario Power Generation.
- ✓ Philip Moy succeeds Lucyna Khazanovich as alternate for the Long Island Power Authority.



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Sector 5 - Marketers, Brokers, and Aggregators

- ✓ Aleksandra Gofman succeeds Sofia Gadea Omelchenko as representative for the Consolidated Edison Company of New York.
- ✓ Qinling Zheng succeeds Alyson Slanover as alternate for the Consolidated Edison Company of New York.

Task Force Roster Changes

The following changes to Task Force and Working Group memberships were approved:

Task Force on Coordination of Operations

- ✓ Ron MacDougall will serve as the Alternate representative for Nova Scotia Power.

Task Force on System Studies

- ✓ Mr. Christopher Reali succeeds Mr. Isen Widjaja as an alternate member, both of the Ontario IESO.
- ✓ Mr. Tracy MacNicoll succeeds Mr. Brian Robinson as member, both of Utility Services, Inc.
- ✓ Mr. Brian Robinson succeeds Mr. Tracy MacNicoll as an alternate member, both of Utility Services, Inc.
- ✓ Mr. John Charlton succeeds Ms. Joy Brake as an alternate member, both of Nova Scotia Power.

CO-11 Working Group on Restoration

- ✓ Mr. Warren Tracz replaces Mr. Tim Shannon as the alternate member for Hydro One.
- ✓ Mr. Kevin Clark replaces Mr. Girard Elliot as the alternate member for ISO-New England, Inc.
- ✓ Mr. Martin Beaudin from Hydro-Quebec replaces Mr. Patrick Toner from Hydro-Quebec as Vice Chair.
- ✓ Ms. Judianne O'Brien becomes an alternate member for ISO-New England, Inc.
- ✓ Mr. Kevin Clark replaces Mr. Shahab Rastegar as the main member for ISO-New England, Inc.

CO-12 Working Group on Seasonal Assessment

- ✓ Mr. Kevin Clark replaces Mr. Michael Courchesne as the alternate member for ISO-New England.

CP-8 Working Group On Review Of Resource And Transmission Adequacy

- ✓ Laura Popa replaces Frank Ciani as primary member and Frank Ciani replaces Laura Popa as alternate member both of New York Independent System Operator.

2018 Interim Area Reviews of Resource Adequacy

- ✓ Maritimes Area
Approved as provided in the Agenda package.
- ✓ New England Area
Approved as provided in the Agenda package.
- ✓ Quebec Area
Approved as provided in the Agenda package.



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2018 Interim Area Transmission Reviews

- ✓ *Quebec Area*
Approved as provided in the Agenda package.
- ✓ *New England Area*
Approved as provided in the Agenda package.
- ✓ *Maritimes Area*
Approved as provided in the Agenda package.

2018 – 2019 NPCC Winter Reliability Assessment

Approved as provided in the Agenda package.

NPCC 2018 Long Range Adequacy Overview

Approved as provided in the Agenda package.

2019 NPCC Criteria Compliance Enforcement Program Implementation Plan

Approved as provided in the Agenda package.

Ontario IESO Mitigation Plan

Approved as provided in the Agenda package.

RCC Scope

Approved as provided in the Agenda package.

Mr. Schwerdt noted, although on the Consent Agenda, the NPCC Area Interim Resource and Transmission Reviews (as well as the Comprehensive Reviews to be presented later in the Agenda) require an enormous amount of effort and shows the strong commitment NPCC members have to reliability, representing some of the best of what NPCC does. He expressed his gratitude to all those involved. Mr. Evans-Mongeon agreed, on behalf of the RCC.

Reliability Coordinating Committee Actions

RCC Co Vice-Chair

By paper/e-mail ballot, the RCC selected Gabriel Adam as a RCC Co-Vice chair for 2019; the RCC recommendation will be sent to the NPCC Board for their consideration.

A-10 Recommendation

Mr. Adam explained that the CP-11 Working Group prepared the Phase II Final Report on the Review of NPCC Document A-10 *Classification of Bulk Power System Elements* (included in the Agenda package) as assigned by the Task Force on Coordination of Planning



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(TFCP). The report summarizes CP-11's Phase II findings and recommendations based on comprehensive testing of the proposed methodologies developed during Phase I.

The CP-11 working Group effort focused on three objectives as highlighted by the TFCP in the project scope:

- ✓ Identify critical facilities for the applicability of NPCC Directories;
- ✓ Improve consistency of application and outcome across the region; and,
- ✓ Simplify the methodology.

Ms. Dawes and Mr. Schwarting then reviewed the related materials provided in the Agenda package, and addressed comments and questions raised by the RCC.

The CP-11 Working Group Final Report concludes that the revised existing methodology is the most effective of the proposed methodologies in identifying those facilities critical to the NPCC Bulk Power System. Additionally, the revisions will promote regional consistency in the application and outcome of the methodology, while also reducing the resources required for application of the methodology.

The TFCP recommends that the CP-11 Working Group should continue its work developing exclusion procedures to determine element by element applicability for Directory No, 1; TFCP expects that this additional work will be completed in early 2019.

The TFCP anticipates incorporating the recommendations contained in the Final Report into a revised draft of the NPCC A-10 document which will be submitted for formal Member comment and subsequent ballot approval during 2019.

The RCC then approved of the Phase II Final Report for Document A-10 Methodology Review included in the Agenda package and move forward with the review of the NPCC Document A-10 to incorporate the recommendations in the report (with two abstention - Sector 4 Generation Owners – Dominion Resources Services, Inc. (Mr. Bodkin) and Sector 5 - Marketers, Brokers, and Aggregators - Utility Services, Inc. – (Mr. Evans-Mongeon)).

2018 Ontario Area Comprehensive Review of Resource Adequacy

Mr. Vithyanathan presented the 2018 Ontario Area Comprehensive Review of Resource Adequacy provided in the Agenda package. The Review covers the period of 2019 through 2023. The Review demonstrates that the Ontario Area complies with the NPCC resource adequacy criterion that requires a loss of load expectation value of not more than 0.1 days/year for all years of the Review.



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The Task Force on Coordination of Planning reviewed the findings at its November 8-9, 2018 meeting, and agreed with the Review's conclusion that the Ontario Area complies with the NPCC resource adequacy criterion and recommends RCC approval.

The RCC then unanimously approved the 2018 Ontario Area Comprehensive Review of Resource Adequacy provided in the Agenda package.

2018 New York Area Comprehensive Review of Resource Adequacy

Ms. Popa presented the 2018 New York Area Comprehensive Review of Resource Adequacy provided in the Agenda package. The Review covers the period of 2019 through 2023. The Review demonstrates that the New York Area complies with the NPCC resource adequacy criterion that requires a loss of load expectation value of not more than 0.1 days/year for all years of the Review.

The Task Force on Coordination of Planning reviewed the findings at its November 8-9 2018 meeting, and agreed with the Review's conclusion that the New York Area complies with the NPCC resource adequacy criterion and recommends RCC approval.

The RCC then unanimously approved the 2018 New York Comprehensive Review of Resource Adequacy provided in the Agenda package.

2017/2018 NPCC UFLS program assessment

Mr. Latulipe reported that the SS-38 Working Group on Inter-Area Dynamic Analysis completed the 2017/2018 NPCC UFLS Assessment (provided in the Agenda package) and is seeking RCC approval.

The initial draft report was reviewed with the Task Force on System Studies (TFSS) at its November 2, 2018 teleconference. All comments received from TFSS members were addressed in this final draft report.

The Assessment demonstrated that the NPCC UFLS Program continues to meet all the performance requirements outlined in the NPCC Automatic Underfrequency Load Shedding standard (PRC-006-NPCC-1), the North American Electric Reliability Corporation (NERC) Automatic Underfrequency Load Shedding standard (PRC-006-3), and the NPCC Directory No. 12 (Automatic UFLS Program Requirements).

He reported that the sensitivity testing involving the use of the NERC composite load dynamic model (CMLD) was not successful, due to model numeric instability. He also noted that the SS-38 Working Group intended to test a sensitivity of UFLS program with high penetration of distributed generation, using dynamic model representation of the distributed generation. NERC and WECC have recently developed a new dynamic model to



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represent distributed generation. The SS-38 Working Group desired to use this model for the sensitivity testing. However, default data is not available for this model yet. Therefore, the SS-38 did not conduct the sensitivity test and recommends conducting this test when default model data becomes available in 2019. The RCC agreed.

The RCC then unanimously approved the 2017 - 2018 NPCC UFLS program assessment provided in the Agenda package.

Mr. Evans-Mongeon acknowledged the leadership of Mr. Latulipe and expressed his thanks to the SS-38 Working Group for their efforts bringing the UFLS assessment to the RCC for approval.

NPCC Composite Misoperation Metric Implementation Plan

Mr. Sahiholamal summarized a presentation provided in the Agenda package describing a risk-based Entity Misoperation Composite Metric (MCM) for NPCC and its members to trend and compare protection system performance across the NPCC Region. NPCC staff initially developed several methods for calculating the MCM and presented them to the SP-7 Working Group and the Task Force on System Protection for consideration until the best method was selected for implementation based on its ability to capture performance for any given time period and for any registered entity size. The MCM employs the data retrieved from the NERC Misoperation Information Data Analysis System.

The metric was designed with emphasis on considerations of risks involved with each protection system misoperation and on misoperations of “Unknown” cause in order to foster increased mitigating actions over time. The final MCM score includes participation from the entity in NPCC SP-7 Working Group reviews of misoperations to address the issues found. The MCM is a combination of different Risk Factors based on the reported Category, Cause and Voltage Class of misoperations. The registered entity MCM Score will be assessed based on the misoperation data from the beginning of first quarter of 2018. The assessment provides an opportunity, on a quarterly basis, for a registered entity, an Area or NPCC as a Region to reduce risk and improve performance. The entity MCM Score pertains to BES protection system misoperations and operations data.

The RCC then approved the NPCC Composite Misoperation Metric Implementation Plan provided in the Agenda package, for implementation starting in January 2019 (with one opposed - Sector 4 - Generation Owners – Dominion Resources Services, Inc., (Mr. Bodkin), and two abstentions; Sector 4 - Generator Owners - Ontario Power Generation (Mr. Cooke) and Sector 5 - Marketers, Brokers, and Aggregators - Utility Services, Inc. – (Mr. Evans-Mongeon)).



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2019 - 2020 Task Force Work Plans

The Task Force chairs highlighted their respective 2019 - 2020 Task Force Work Plans provided in the Agenda Package.

The RCC then unanimously approved the 2019 - 2020 Task Force Work Plans, as provided in the Agenda package.

2019 – 2020 RCC Work Plan

Following the review and approval of the NPCC Task Forces' respective 2019 - 2020 Work Plans, the RCC reviewed its 2019 – 2020 Work Plan.

The RCC then unanimously recommended the 2019 - 2020 RCC Work Plan as provided in the Agenda package be submitted for NPCC Board approval.

Items for Discussion

NERC Agenda Items

*Joint Session: Planning, Operating & Critical Infrastructure Protection Committee
December 11, 2018 Meeting*

Mr. Oks reviewed the following presentations scheduled for the December 11 , 2018 Joint Session included in the Agenda package:

- ✓ Inverter-based Resource Performance Task Force (IRPTF);
- ✓ PJM Fuel Security Analysis;
- ✓ Composite Generation and Transmission Analysis; and,
- ✓ Electricity Information Sharing and Analysis Center (E-ISAC) Update.

Operating Committee (OC) Meeting

Mr. Oks then highlighted the following items from the December 11-12, 2018 OC Agenda included in the Agenda package:

- ✓ Ratify the IRPTF Gaps Whitepaper and Standards Authorization Request;
- ✓ Approve the Operating Reliability Subcommittee (ORS) - Reliability Coordinator Reliability Plan Reference Document and ORS Scope;
- ✓ Approve the Resources Subcommittee Scope;
- ✓ Approve changes in BA Area Footprints Reference Document;
- ✓ Authorization to post for a 45-day comment period:
 - Reliability Guideline: Generating Unit Operations During Complete Loss of Communications;
 - Loss of Real-Time Reliability Tools; and,
 - Primary Frequency Control Guideline.

Mr. Evans-Mongeon provided the background regarding the PRC-024 Technical Report and the status of the Standards Authorization Request.



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Planning Committee (PC) Meeting

Mr. Fedora highlighted the following items from the Draft December 11-12, 2018 Planning Committee Agenda included in the Agenda package:

- ✓ NERC 2018-19 Winter Reliability Assessment;
- ✓ Status of the NERC 2018 Long-Term reliability Assessment;
- ✓ Recommendations from Natural Gas Disruptions Special Assessment Next Steps:
 - Fuel Assurance Planning Reliability Guidelines, and,
 - Electric-Gas Working Group – Development of work scope and activities.
- ✓ Roundtable Discussion:
 - DER Impacts;
 - UFLS program update; and,
 - Summer/Winter Operational “Lessons Learned.”

Critical Infrastructure Protection Committee (CIPC)

Mr. Hogue noted the following items from the December 11-12, 2018 CIPC Agenda included in the Agenda package:

- ✓ Approval of the Physical Security Guideline for the Electricity Sector: Security Considerations, High Impact Control Centers;
- ✓ CIP Standards Development Update:
 - CIP Modification Team Update; and,
 - Project 2018-02 Modifications to CIP-008.

NPCC Corporate Goal Deliverables

Strategic Review of the Need for NPCC Criteria Report

Mr. Dunbar referred to the report (included in the Agenda package) of the *Strategic Review of the Need for NPCC Reliability Criteria*, developed in response to direction provided by the NPCC Board of Directors.

NPCC staff developed an action plan for strategic review of the NPCC Criteria which was provided to the Task Force on Coordination of Planning (TFCP) in advance of its February 6-7, 2018 meeting. NPCC staff then developed a framework for the strategic review report and, on August 6, 2018 provided a first draft to the NPCC Task Forces for review and comment. Subsequently, NPCC staff developed a second draft after reviewing, considering, and responding to the comments received. This was followed by TFCP submitting a revised draft of the strategic report to the Regional Standards Committee (RSC) and RCC for a thirty-day comment period that ran from September 5 to October 5, 2018. Lastly, comments that were received from the RSC and RCC were considered and incorporated by TFCP into the final report. The TFCP reviewed the final report and provided it to the RCC and RSC for consideration at their respective December 4 and 6, 2018 meetings.



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The report contains recommendations for further actions on the individual Directories, including the identification of the additional reliability benefits provided by the more stringent Criteria requirements, and their cost effectiveness, which will be incorporated into the 2019 Task Force work plans. Additionally, the RSC is in the process of revising the NPCC Directory Development and Revision Manual to further emphasize the importance of identification and documentation of incremental reliability benefit beyond NERC Standards while considering cost effectiveness.

Trend Analysis of 2018 Events

Mr. Hogue presented an assessment which illustrates the comparison and trend analysis of the 2017 NPCC and ERO-wide events, utilizing NERC's Event Severity Risk Index (eSRI) vs. NPCC's eSRI category ranges. The results of this analysis were combined with that of the 2015 and 2016 data previously presented to the RCC at its May 30, 2018 meeting. NPCC analyzed system events to identify risks, mitigation strategies, and lessons learned by performing a comparison and trending analysis to gauge the relative risk of the events trending year-to-year. This captured the analysis of continent-wide event severity risk indices (eSRI) of all qualifying NPCC and NERC-wide Event Analysis Process (EAP) events from 2015 through the third quarter of 2018.

The analysis compared the various event specific eSRI values with the eSRI category ranges to ascertain whether the events that were categorized in the Event Analysis Program fell not only within their respective eSRI category ranges, but also where in the range, to gauge their relative impact and relative risk of the events trending year-to-year. With the exception of outlier events, which were accounted for, this analysis evaluated potential reliability trends and provided an indication as to the exposure these events could have to becoming more impactful events.

The analysis conducted allowed for a more in-depth evaluation of the effect of outliers on the year to year overall trending of NPCC, as well as, continent-wide events for the study period. Outliers are those events whose eSRI exceeds the eSRI category range for EAP Category Tier 1 events. Although these outlier events can be viewed as near misses (within their relative category), the analysis showed that for the study years, only a small percentage (2%) of these events occurred. It was observed that, with the outliers removed from both NPCC and the continent-wide data, the trending of overall eSRI values for the remaining events was relatively consistent and aligned with the expected eSRI category ranges.

The analysis also provided insight into which type of events (EAP category 1a – “*An unexpected outage that is contrary to design of three or more BES Facilities caused by a common disturbance*” and its subcategories) was the most prevalent and presently poses the greatest risk to escalate. These observations provide the registered entities with valuable information in order to focus future study and resources on reducing risks to reliability.



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Development of DER Planning Guidelines

Mr. Lombardi reported on the identification of current practices throughout the NPCC Region for incorporation of installed Distributed Energy Resources (DER) in planning practices. A summary of the DER modeling practices, based on the Task Force on System Studies (TFSS) DER modeling practices survey responses from each NPCC Balancing Authority/Control Area, along with a compilation of all of the survey responses was presented at the May 30, 2018 RCC meeting. To ensure consistency in the survey results and allow for an accurate comparison of responses, the survey used the New York Public Service Commission DER Definition.

A scope to create guidelines for incorporating DERs into planning studies was developed and was approved by the RCC at their September 5, 2018 meeting. Subsequent to that meeting, NERC created a System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG). The scope for the SPIDERWG parallels the scope RCC approved at its September meeting. Additionally, each of the NPCC Balancing Authority/Control Areas will be represented on the SPIDERWG. The TFSS will have the activities of the SPIDERWG as a standing agenda item so that NPCC can provide coordinated input and the progress of the Working Group can be followed.

Given the formation of this NERC Working Group and its broad participation, the TFSS recommends that the RCC give the SPIDERWG time to complete its scope of work before proceeding on its own to develop DER modeling guidelines. This course of action would be consistent with the intent of the RCC approved scope.

Accelerated Retirements Report

Mr. Lal presented the results (included in the Agenda package) of the conventional generation retirement, generation additions and demand level for the 2028 assessment year. The 2018 NERC Long-Term Reliability Assessment data, along with the assistance of the NPCC CP-8 Working Group formed the basis of the assumptions used in the preliminary results. The scope for an evaluation of the impact on resource adequacy of accelerated retirements of generation within NPCC was developed to complement NERC's industry-wide analysis and reported to the RCC. Preliminary results were based primarily on the initial NERC 2018 Long-Term Reliability Assessment data with input from the NPCC CP-8 Working Group. Feedback provided by the RCC at their September 5, 2018 meeting was considered in the assessment.

The assessment results underwent a final review and comment period by the NPCC CP-8 Working Group that finalized the evaluation results. Each NPCC Balancing Authority/Control Area identified its respective assumptions for the analysis. The assessment concluded that alternative Balancing Authority/Control Area planning scenarios



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are available to achieve an adequate level of resources to meet demand for the assessment year of 2028 in all NPCC Balancing Authority/Control Areas for the assumed accelerated retirements.

Mechanisms identified to manage accelerated retirements include provisions in the forward capacity markets and Regional transmission expansion processes. The assessment highlighted the importance of considering the impact of environmental, economic, and regulatory policies in future resource retirements assessments.

Mr. Adam commented that what is missing in this analysis is consideration of the assumptions that a deterministic resource adequacy assessment would make, such as reserve requirements, for example. He mentioned the need to be careful when conducting these types of assessments; the conclusions drawn may not be supported by the accuracy of the study. He questioned the value of the analysis beyond what is done in the NERC Long-Term Reliability Assessment or the required NPCC Area resource adequacy studies.

Mr. Schwerdt responded that as mentioned in his report, this study is an example of a more regionally focused follow-up activity to a NERC industry-wide reliability assessment. It is a snapshot, with scenarios in terms specific to the NPCC region, having more sophistication than the preliminary versions of the NERC report on the same topic, and from that perspective, hit the objective. He noted that it did not look at energy sufficiency, an area that will require more focus moving forward.

Mr. Adam said his critique is with regards to the methodology; a straight forward capacity versus demand analysis does not account for forced outages, forecast error and other uncertainties that provide the reasons to carry additional reserves. The analysis is missing consideration of elements that normally a resource adequacy analysis should include.

Gas Disruption Report

Mr. Fedora presented the revised results of the assessment (the Agenda package will be updated with the revised results following the RCC meeting). NPCC conducted a detailed assessment using a power system simulator to confirm NERC's screening analysis of a generation cluster within NPCC that may create reliability risks under significant loss of natural gas infrastructure. The scope of work for the assessment was reported to the RCC at its February 28, 2018 meeting. The NERC assessment identified generation clusters within New England susceptible to natural gas disruption on the Algonquin pipeline.

NPCC retained Levitan & Associates, Inc. (LAI) to conduct steady state and transient flow (natural gas supply) modeling in order to identify "at-risk" generation following contingency event(s) and the time to disruption as a result of pressure decay. NPCC conducted power



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system simulations to illustrate the reliability impacts of the subsequent generation dispatch.

Preliminary results were presented to the RCC at its September 5, 2018 meeting. A Base Case (with no gas disruption) was developed for a representative 2018 summer peak load period (August). Electric generator gas requirements were incorporated into the gas hydraulic model. The preliminary results were based on the power system simulator unit commitment input from ISO New England and gas hydraulic modeling from LAI. Feedback from the September 5 RCC meeting was also considered in the assessment.

The simulated results of a rupture on the 30” Algonquin mainline between Brookfield and the CPV Towantic generating station was reported; the 26” Algonquin mainline in the same location was also assumed shutdown following the event for safety inspection. The proposed Algonquin pipeline contingency results in a significant impact on both direct connected and local generation resources; i.e., a force majeure event.

The results indicated limited immediate effects – only two generation resources were lost within 10 minutes of the event; gas supply to most Algonquin-served generation resources was lost over several hours following the event based on line pressure decay. New England’s bulk power system was able to recover from the Algonquin gas pipeline contingency, with long durations of 10 and 30-minute operating reserve deficiencies.

Fifteen power flow cases were simulated during the contingency (hours 9 – 23); the power flow cases revealed no voltage violations on the New England bulk power system under the assumed conditions. Use of New England’s emergency capacity and energy procedures were needed; however, the study did not indicate the need for firm load shedding.

Wind/Solar Load Correlation Report

Mr. Klaube explained that NPCC Balancing Authority/Control Area probabilistic models for wind and behind the meter (BTM) solar resources developed using @Risk software - a risk analysis software that uses Monte Carlo simulations to assess the probabilities of a certain event occurring based on a specific set of inputs and assumptions. Wind and BTM solar output results varied by calendar month, as reflected in the Balancing Authority/Control Area probability curves and models. The probabilistic curves were then used to run simulations in the @Risk software to develop probabilistic models.

Wind models for all Balancing Authority/Control Areas revealed the highest probability of occurrence around 10% of the installed capacity. Higher capacity factors generally resulted in larger probabilities of occurrence in the colder, winter months (November through March) for all Balancing Authority/Control Areas. BTM solar (applicable for New York, New England and Ontario only) probabilistic models revealed steep drops in probabilities of



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occurrence from 0% to 10% capacity factors. Higher capacity factors displayed larger probabilities of occurrence in the months of spring (April through June) and late summer (September).

Peak load wind and BTM solar correlations were developed by evaluating the daily peak hour loads during the respective, Balancing Authority/Control Area peak load periods (summer or winter) and the corresponding resource outputs from the hourly, aggregate resource datasets. The daily peak load and resource outputs were then graphed on a scatter plot with a linear trend line to measure degree of correlation.

Results of the analysis (provided in the Agenda package) indicate that there is limited consistent correlation between wind and BTM solar resources and Balancing Authority/Control Area daily peak demands. Wind resource probability models displayed a high degree of variation within months and years and did not follow consistent patterns or trends. While some Balancing Authority/Control Area results (such as Québec) showed a strong positive correlation between wind and peak demand, this was not consistent across the NPCC Region.

With no other matters to consider, the RCC meeting was adjourned.

Next RCC Meeting Date

Wednesday, February 27, 2019

Location

The New York Times Square
Residence Inn by the Marriott

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