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## NPCC Regional Reliability Reference Directory # 1 Design and Operation of the Bulk Power System

Task Force on Coordination of Planning Revision Review Record:
<b>December 01, 2009</b>

Adopted by the Members of the Northeast Power Coordinating Council, Inc., on December 01, 2009 based on recommendation by the Reliability Coordinating Committee, in accordance with Section VIII of the NPCC Amended and Restated Bylaws dated July 24, 2007 as amended to date.

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## Appendix D - Guidelines for Area Review of Resource Adequacy

### 1.0 Introduction

NPCC has established a Reliability Assessment Program to bring together work done by the NPCC and Planning Coordinators relevant to the assessment of **bulk power system reliability**. As part of the Reliability Assessment Program, each Planning Coordinator submits to the Task Force on Coordination of Planning its resource adequacy assessment consistent with these guidelines. The Task Force is charged, on an ongoing basis, with reviewing and recommending NPCC Reliability Coordinating Committee approval of these reviews of **resource** adequacy of each Planning Coordinator Area of NPCC.

**Resources** refer to the total contributions provided by supply-side and demand-side facilities and actions. Supply-side facilities include all generation sources within a Planning Coordinator Area and firm capacity backed purchases from neighboring systems. Demand-side facilities include measures for reducing or shifting **load**, such as conservation, **load** management, interruptible **loads**, dispatchable **loads** and small identified generation which is not metered at the control centers.

The NPCC role in monitoring conformance with the NPCC Directory #1 - *Design and Operation of Bulk Power System* is essential because under this criterion, each Planning Coordinator determines its resource requirements by considering interconnection assistance from other Planning Coordinators, on the basis that adequate **resources** will be available in those Planning Coordinator Areas. Because of this reliance on interconnection assistance, inadequate **resources** in one Planning Coordinator Area could result in adverse consequences in another Planning Coordinator Area.

It is recognized that all Planning Coordinators may not necessarily express their own **resource** adequacy criterion as stated in the NPCC Basic Criteria in Directory #1. However, the NPCC Basic Criteria provides a reference point against which a Planning Coordinator's **resource** adequacy criterion can be compared.

The NPCC will not duplicate reviews and studies completed by member systems and Planning Coordinators. The NPCC may reference these reviews in appropriate NPCC reports.

### 2.0 Purpose of Presentation

The purpose of the presentation associated with a **resource** adequacy review is to show that each Planning Coordinator's proposed **resources** are in accordance with the NPCC Directory #1 - *Design and Operation of the Bulk Power System*. By such a presentation, the Task Force will satisfy itself that the proposed **resources** of each NPCC Planning Coordinator will meet the NPCC Resource Adequacy -

Design Criteria, as defined NPCC Directory #1, over the time period under consideration. The review by the Task Force on Coordination of Planning does not replace Planning Coordinator and/or company responsibility to assess their systems in conformity with the NPCC Basic Criteria in Directory #1.

### 3.0 Time Period to be Considered

The time period to be considered for a Planning Coordinator's Comprehensive **Resource** Review will be five years and be undertaken every three years. In subsequent years, the Planning Coordinator shall conduct Annual Interim Reviews that will cover, at a minimum, the remaining years studied in the Comprehensive Review. Based on the results of the Annual Interim Review, the Task Force may recommend that the Planning Coordinator conduct the next Comprehensive Review at a date earlier than specified above. Comprehensive and Interim reviews are normally expected to be presented to the Task Force before the beginning of the first time period covered by the assessment.

### 4.0 Format of Presentation and Report – Comprehensive Review

Each Planning Coordinator should include in its presentations and in the accompanying report documentation, as a minimum, the information listed below. At its own discretion, the Planning Coordinator may discuss other related issues not covered specifically by these guidelines.

#### 4.1 Executive Summary

- 4.1.1 Briefly illustrate the major findings of the review.
- 4.1.2 Provide a table format summary of major assumptions and results.

#### 4.2 Table of Contents

- 4.2.1 Include listing of all tables and figures.

#### 4.3 Introduction

- 4.3.1 Reference the previous NPCC Area Review.
- 4.3.2 Compare the proposed **resources** and **load** forecast covered in this NPCC review with that covered in the previous review

#### 4.4 Resource Adequacy Criterion

- 4.4.1 State the Planning Coordinator's **resource** adequacy criterion.
- 4.4.2 State how the Planning Coordinator criterion is applied; e.g., **load** relief steps.
- 4.4.3 Summarize **resource** requirements to meet the criteria for the time period under consideration. If interconnections to other Planning Coordinators and regions are considered in determining this requirement, indicate the value of the interconnections in terms of megawatts.
- 4.4.4 If the Planning Coordinator criterion is different from the NPCC criterion, provide either an estimate of the **resources** required to meet the NPCC criteria or a statement as to the comparison of the two criteria.
- 4.4.5 Discuss **resource** adequacy studies conducted since the previous Area Review, as appropriate.

#### 4.5 Resource Adequacy Assessment

- 4.5.1 Evaluate proposed **resources** versus the requirement to reliably meet projected electricity demand assuming the Planning Coordinator's most likely **load** forecast.
- 4.5.2 Evaluate proposed **resources** versus the requirement to reliably meet projected electricity demand assuming the Planning Coordinator's high **load** growth scenario.
- 4.5.3 Discuss the impact of **load** and **resource** uncertainties on projected Planning Coordinator Area **reliability** and discuss any available mechanisms to mitigate potential **reliability** impacts.
- 4.5.4 Review the impacts that major proposed changes to market rules may have on Planning Coordinator Area **reliability**.

#### 4.6 Proposed Resource Capacity Mix

- 4.6.1 Discuss any **reliability** impacts resulting from the proposed **resources** fuel supply and transportation or environmental considerations.
- 4.6.2 Describe available mechanisms to mitigate any potential **reliability** impacts of **resource** fuel supply, demand resource response, transportation issues and/or environmental considerations.

- 4.6.3 Discuss any **reliability** impacts related to an **Area's** compliance with state, Federal or Provincial requirements (such as environmental, renewable energy, or greenhouse gas reductions).

## 5.0 Format of Presentation and Report – Annual Interim Review

The Annual Interim Review should include a reference to the most recent Comprehensive Review; a listing of major changes in: facilities and system conditions, **load** forecast, generation resources availability; related fuel supply and transportation information, environmental considerations, demand response programs, transfer capability and **emergency** operating procedures. In addition, the assessment should also include a comparison of major changes in market rules, implementation of new rules, locational requirements, and installed capacity requirements. Finally, the report should include a brief impact assessment and an overall summary.

The Planning Coordinator will provide a brief assessment of the impact of these changes on the **reliability** of the interconnected **bulk power system**. This assessment should be based on engineering judgment, internal system studies and appropriate joint interconnected studies. To the extent that engineering judgment or existing studies can be used to clearly demonstrate that a Planning Coordinator Area is expected to meet the NPCC resource adequacy criterion, detailed system LOLE studies are not required.

The documentation for the Annual Interim Review should be in the form of a summary report (normally not exceeding three to five pages.)

Sections A and B should describe the **reliability** model and program used for the **resource** adequacy studies discussed in Section 4.5. Section C should describe the Task Force follow-up procedures.

### A. Description of Resource Reliability Model

#### 1.1 Load Model

- 1.1.1 Description of the **load** model and basis of period **load** shapes.
- 1.1.2 How **load** forecast uncertainty is handled in model.
- 1.1.3 How the electricity demand and energy projections of interconnected entities within the Planning Coordinator Area that are not members of the Planning Coordinator Area are addressed.

- 1.1.4 How the effects (demand and energy) of demand-side management programs (e.g., conversion, interruptible demand, direct control **load** management, demand (**load**) response programs) are addressed.
- 1.2 Supply Side **Resource** Representation
  - 1.2.1 Resource Ratings
    - 1.2.1.1 Definitions.
    - 1.2.1.2 Procedure for verifying **ratings**.  
Reference NPCC Document B-9, *Guide for Rating Generating Capability*.
  - 1.2.2 Unavailability Factors Represented
    - 1.2.2.1 Type of unavailability factors represented; e.g., forced outages, planned outages, partial derating, etc.
    - 1.2.2.2 Source of each type of factor represented and whether generic or individual unit history provides basis for existing and new units.
    - 1.2.2.3 Maturity considerations, including any possible allowance for in-service date uncertainty.
    - 1.2.2.4 Tabulation of typical unavailability factors.
  - 1.2.3 Purchase and Sale Representation.
    - 1.2.3.1 Describe characteristics and level of dependability of transactions.
  - 1.2.4 Retirements.
    - 1.2.4.1 Summarize proposed retirements.
- 1.3 Representation of Interconnected System in Multi-Area **Reliability** Analysis, including which Planning Coordinator Areas and regions are considered, interconnection capacities assumed, and how expansion plans of other Planning Coordinators and regions are considered.

- 1.4 Modeling of Variable and Limited Energy Sources.
- 1.5 Modeling of Demand Side Resources and Demand (**Load**) Response Programs.
  - 1.5.1 Description should include how such factors as in-service date uncertainty, **rating**, availability, performance and duration are addressed.
- 1.6 Modeling of all **Resources**.
  - 1.6.1 Description should include how such factors as in-service date uncertainty; capacity value, availability, **emergency** assistance, scheduling and deliverability are addressed.
- 1.7 Other assumptions i.e., internal transmission limitations, maintenance over-runs, fuel supply and transportation and environmental constraints.
- 1.8 Incorporate the **reliability** impacts of market rules.

**B. Other Factors, If Any, Considered in Establishing Reserve Requirement Documentation**

The documentation required to meet the requirements of the above format should be in the form of summaries of studies performed within a Planning Coordinator Area, including references to applicable reports, summaries of reports or submissions made to regulatory agencies.

**C. Task Force Follow-Up Procedures**

Once a specific Planning Coordinator has made a presentation or a series of presentations to the Task Force on Coordination of Planning, the latter shall:

- 1. Prepare a brief summary of key issues discussed during the presentation.
- 2. Note where further information was requested and the results of such further interrogations.
- 3. Note the specific items that require additional study and indicate the responsibilities for undertaking these studies.

4. Recommend approval to the Reliability Coordinating Committee.