

## A. Introduction

**1. Title:** Planning Resource Adequacy Analysis, Assessment and Documentation

**2. Number:** BAL-502-RFC-02

**3. Purpose:**

To establish common criteria, based on “one day in ten year” loss of Load expectation principles, for the analysis, assessment and documentation of Resource Adequacy for Load in the ReliabilityFirst Corporation (RFC) region

**4. Applicability**

**4.1** Planning Coordinator

**5. Effective Date:**

**5.1** Upon RFC Board approval

## B. Requirements

**R1** The Planning Coordinator shall perform and document a Resource Adequacy analysis annually. The Resource Adequacy analysis shall [*Violation Risk Factor: Medium*]:

**R1.1** Calculate a planning reserve margin that will result in the sum of the probabilities for loss of Load for the integrated peak hour for all days of each planning year<sup>1</sup> analyzed (per R1.2) being equal to 0.1. (This is comparable to a “one day in 10 year” criterion).

**R1.1.1** The utilization of Direct Control Load Management or curtailment of Interruptible Demand shall not contribute to the loss of Load probability.

**R1.1.2** The planning reserve margin developed from R1.1 shall be expressed as a percentage of the median<sup>2</sup> forecast peak Net Internal Demand (planning reserve margin).

**R1.2** Be performed or verified separately for each of the following planning years:

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<sup>1</sup> The annual period over which the LOLE is measured, and the resulting resource requirements are established (June 1<sup>st</sup> through the following May 31<sup>st</sup>).

<sup>2</sup> The median forecast is expected to have a 50% probability of being too high and 50% probability of being too low (50:50).

**R1.2.1** Perform an analysis for Year One.

**R1.2.2** Perform an analysis or verification at a minimum for one year in the 2 through 5 year period and at a minimum one year in the 6 through 10 year period.

**R1.2.2.1** If the analysis is verified, the verification must be supported by current or past studies for the same planning year.

**R1.3** Include the following subject matter and documentation of its use:

**R1.3.1** Load forecast characteristics:

- Median (50:50) forecast peak Load.
- Load forecast uncertainty (reflects variability in the Load forecast due to weather and regional economic forecasts).
- Load diversity.
- Seasonal Load variations.
- Daily demand modeling assumptions (firm, interruptible).
- Contractual arrangements concerning curtailable/Interruptible Demand.

**R1.3.2** Resource characteristics:

- Historic resource performance and any projected changes
- Seasonal resource ratings
- Modeling assumptions of firm capacity purchases from and sales to entities outside the Planning Coordinator area.
- Resource planned outage schedules, deratings, and retirements.
- Modeling assumptions of intermittent and energy limited resource such as wind and cogeneration.
- Criteria for including planned resource additions in the analysis

**R1.3.3** Transmission limitations that prevent the delivery of generation reserves

**R1.3.3.1** Criteria for including planned Transmission Facility additions in the analysis

**R1.3.4** Assistance from other interconnected systems including multi-area assessment considering Transmission limitations into the study area.

**R1.4** Consider the following resource availability characteristics and document how and why they were included in the analysis or why they were not included:

- Availability and deliverability of fuel.
- Common mode outages that affect resource availability
- Environmental or regulatory restrictions of resource availability.
- Any other demand (Load) response programs not included in R1.3.1.
- Sensitivity to resource outage rates.
- Impacts of extreme weather/drought conditions that affect unit availability.
- Modeling assumptions for emergency operation procedures used to make reserves available.
- Market resources not committed to serving Load (uncommitted resources) within the Planning Coordinator area.

**R1.5** Consider Transmission maintenance outage schedules and document how and why they were included in the Resource Adequacy analysis or why they were not included

**R1.6** Document that capacity resources are appropriately accounted for in its Resource Adequacy analysis

**R1.7** Document that all Load in the Planning Coordinator area is accounted for in its Resource Adequacy analysis

**R2** The Planning Coordinator shall annually document the projected Load and resource capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis [*Violation Risk Factor: Lower*].

**R2.1** This documentation shall cover each of the years in Year One through ten.

**R2.2** This documentation shall include the planning reserve margin calculated per requirement R1.1 for each of the three years in the analysis.

**R2.3** The documentation as specified per requirement R2.1 and R2.2 shall be publicly posted no later than 30 calendar days prior to the beginning of Year One.

**C. Measures**

**M1** Each Planning Coordinator shall possess the documentation that a valid Resource Adequacy analysis was performed or verified in accordance with R1

**M2** Each Planning Coordinator shall possess the documentation of its projected Load and resource capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis on an annual basis in accordance with R2.

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1. Compliance Monitoring Responsibility**

Compliance Monitor - Reliability *First* Corporation

**1.2. Compliance Monitoring Period and Reset Timeframe**

One calendar year

**1.3. Data Retention**

The Planning Coordinator shall retain information from the most current and prior two years.

The Compliance Monitor shall retain any audit data for five years.

**2. Violation Severity Levels**

Req. Number	VIOLATION SEVERITY LEVEL			
	LOWER	MODERATE	HIGH	SEVERE
R1	The Planning Coordinator Resource Adequacy analysis failed to consider 1 or 2 of the Resource availability characteristics subcomponents under R1.4 and documentation of how and why they were included in the analysis or why they	The Planning Coordinator Resource Adequacy analysis failed to express the planning reserve margin developed from R1.1 as a percentage of the net Median forecast peak Load per R1.1.2  <b>OR</b>	The Planning Coordinator Resource Adequacy analysis failed to be performed or verified separately for individual years of Year One through Year Ten per R1.2  <b>OR</b>	The Planning Coordinator failed to perform and document a Resource Adequacy analysis annually per R1.  <b>OR</b>  The Planning Coordinator Resource

	<p>were not included</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to consider Transmission maintenance outage schedules and document how and why they were included in the analysis or why they were not included per R1.5</p>	<p>The Planning Coordinator Resource Adequacy analysis failed to include 1 of the Load forecast Characteristics subcomponents under R1.3.1 and documentation of its use</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include 1 of the Resource Characteristics subcomponents under R1.3.2 and documentation of its use</p> <p><b>Or</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to document that all Load in the Planning Coordinator area is accounted for in its Resource Adequacy analysis per R1.7</p>	<p>The Planning Coordinator failed to perform an analysis or verification for one year in the 2 through 5 year period or one year in the 6 through 10 year period or both per R1.2.2</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include 2 or more of the Load forecast Characteristics subcomponents under R1.3.1 and documentation of their use</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include 2 or more of the Resource Characteristics subcomponents under R1.3.2 and documentation of their use</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include Transmission limitations and documentation of its use</p>	<p>Adequacy analysis failed to calculate a Planning reserve margin that will result in the sum of the probabilities for loss of Load for the integrated peak hour for all days of each planning year analyzed for each planning period being equal to 0.1 per R1.1</p> <p><b>OR</b></p> <p>The Planning Coordinator failed to perform an analysis for Year One per R1.2.1</p>
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			<p>per R1.3.3</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include assistance from other interconnected systems and documentation of its use per R1.3.4</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to consider 3 or more Resource availability characteristics subcomponents under R1.4 and documentation of how and why they were included in the analysis or why they were not included</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to document that capacity resources are appropriately accounted for in its Resource Adequacy analysis per R1.6</p>	
R2	The Planning Coordinator failed to publicly post the documents as specified	The Planning Coordinator failed to document the projected Load and resource	The Planning Coordinator failed to document the projected Load and resource	The Planning Coordinator failed to document the projected Load and resource

	<p>per requirement R2.1 and R2.2 later than 30 calendar days prior to the beginning of Year One per R2.3</p>	<p>capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis for one of the years in the 2 through 10 year period per R2.1.</p> <p><b>OR</b></p> <p>The Planning Coordinator failed to document the Planning Reserve margin calculated per requirement R1.1 for each of the three years in the analysis per R2.2.</p>	<p>capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis for year 1 of the 10 year period per R2.1.</p> <p><b>OR</b></p> <p>The Planning Coordinator failed to document the projected Load and resource capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis for two or more of the years in the 2 through 10 year period per R2.1.</p>	<p>capability, for each area or Transmission constrained sub-area identified in the Resource Adequacy analysis per R2.</p>
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**Definitions:**

**Resource Adequacy** - the ability of supply-side and demand-side resources to meet the aggregate electrical demand (including losses).

**Net Internal Demand** - Total of all end-use customer demand and electric system losses within specified metered boundaries, less Direct Control Load Management and Interruptible Demand.

**Peak Period** - A period consisting of two (2) or more calendar months but less than seven (7) calendar months, which includes the period during which the responsible entity's annual peak demand is expected to occur

**Year One** - The planning year that begins with the upcoming annual Peak Period.

**The following definitions were extracted from the February 12<sup>th</sup>, 2008 NERC Glossary of Terms:**

**Direct Control Load Management** – Demand-Side Management that is under the direct control of the system operator. DCLM may control the electric supply to individual appliances or equipment on customer premises. DCLM as defined here does not include Interruptible Demand.

**Facility** - A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generator, a shunt compensator, transformer, etc.)

**Interruptible Demand** - Demand that the end-use customer makes available to its Load-Serving Entity via contract or agreement for curtailment.

**Load** - An end-use device or customer that receives power from the electric system.

**Transmission** - An interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.

### Version History

Version	Date	Action	Change Tracking
BAL-502-RFC-02 1 <sup>st</sup> Draft	06/24/08 Through 07/23/08	Posted for 1 <sup>st</sup> Comment Period	
BAL-502-RFC-02 2 <sup>nd</sup> Draft	08/18/08 Through 09/16/08	Posted for 2 <sup>nd</sup> Comment Period	
BAL-502-RFC-02 3 <sup>rd</sup> Draft	10/16/08 Through 10/30/08	Posted for 15-Day Category Ballot	
BAL-502-RFC-02 3 <sup>rd</sup> Draft	12/04/08	ReliabilityFirst Board Approved	
BAL-502-RFC-02	06/08/09	“Planning Reserve” changed to “planning reserve” in R2.2.	Errata
BAL-502-RFC-02	08/05/09	Approved by NERC Board of Trustees	
BAL-502-RFC-02	03/23/11	Order issued by FERC approving BAL-502-RFC-02 (approval effective 5/23/11)	