

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the NERC Reliability Standards Glossary of Terms or the MRO Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Midwest Reliability Organization (MRO) Glossary. NERC and MRO defined terms are capitalized in the standard.*

**Resource Adequacy**<sup>1</sup> is defined as the ability of supply-side and demand-side resources to meet the aggregate electrical demand and energy requirements of the end-use customers with a specified degree of reliability.

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<sup>1</sup> Historically, the Resource Adequacy requirement was referred to as the planning reserve margin in MAIN Guide #6 and the Reserve Capacity Obligation (RCO) in the MAPP Generation Reserve Sharing Pool Handbook.

**A. Introduction**

1. **Title:** Planned Resource Adequacy Assessment<sup>2</sup>
2. **Number:** RES-501-MRO-02
3. **Purpose:** To establish common criteria by which to assess Resource Adequacy in the MRO for the 10 year planning horizon.
4. **Applicability**
  - 4.1. Planning Coordinator
5. **Effective Date:** 1<sup>st</sup> day of the 1<sup>st</sup> quarter following all appropriate Regulatory Authority Approvals, financial sanctions will become effective.

**B. Requirements**

- R1** The Planning Coordinator shall perform and possess the documentation of a planned Resource Adequacy assessment. [*Violation Risk Factor: Medium*] [*Time Horizon: Long-Term Planning*]

To be valid, the Resource Adequacy assessment shall:

**R1.1** Be performed annually unless a document summarizing a review of system data that concludes that changes to system data used in the assessment do not warrant such a study is provided to the MRO. A study is warranted if changes have occurred that require revisions in any key assumptions such as generation mix and transmission limitations that are not covered by a sensitivity study. The planned Resource Adequacy assessment is to be conducted for Year One through Year Ten. Year One is defined as the year that begins with the upcoming annual peak season.

**R1.2** Be performed to meet a LOLP of no greater than 0.1 day in one (1) year which equals the sum of the LOLE for the integrated daily peak hours for each year. This shall be done for a minimum of 3 periods within the Year One through Year Ten (as defined in R1.1) to ensure meeting one (1) day in ten (10) years. These periods are Year One, a minimum of one year in years 2 through 5, and a minimum of one year in years 6 through 10. Analysis shall:

**R1.2.1** Use loads developed from the expected 50:50 probability load forecast,

**R1.2.2** Include load forecast uncertainty such as uncertainty due to load diversity, seasonal load variation, load variability due to other region economic forecasts or other factors.

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<sup>2</sup> In accordance with the Energy Policy Act of 2005, this standard does not authorize the MRO, ERO or FERC to order the construction of additional generation or transmission capacity or to set and enforce compliance with standards for adequacy or safety of electric facilities or services. Nothing in this standard shall be construed to preempt any authority of any State/Province to take action to ensure the safety, adequacy, and reliability of electric service within that State, as long as such action is not inconsistent with any reliability standard, as long as such action does not result in lesser reliability outside the State/Province than that provided by the reliability standards.

**R1.2.3** Be performed for every day of each year throughout the period in R1.1.

Expected Unserved Energy may be performed as the method to meet R1.2 provided the results of such an assessment is compared with an LOLP analysis and the comparison is documented.

**R1.3** Include, at a minimum, documentation of how and why the following were/were not included in the analysis:

**R1.3.1** Resource availabilities

- 1.3.1.1** Historic resource performance and any projected changes
- 1.3.1.2** Seasonal resource ratings
- 1.3.1.3** Modeling assumptions of non-conventional resources such as wind and cogeneration
- 1.3.1.4** Energy limitations of hydroelectric units.
- 1.3.1.5** Merchant plant availabilities
- 1.3.1.6** Modeling assumptions of firm capacity purchases from and sales to entities outside the Planning Coordinator area
- 1.3.1.7** Availability and deliverability of fuel
- 1.3.1.8** Common mode outages that effect resource adequacy
- 1.3.1.9** Other environmental or regulatory restrictions of resource availability
- 1.3.1.10** Available Demand-Side Management
- 1.3.1.11** Resource maintenance outage schedules
- 1.3.1.12** Sensitivity to resource outage rates and resource capabilities
- 1.3.1.13** Consider impacts of extreme weather/drought conditions

**R1.3.2** Load Characteristics

- 1.3.2.1** Load forecasts
- 1.3.2.2** Load forecast uncertainty
- 1.3.2.3** Load diversity
- 1.3.2.4** Seasonal load variations
- 1.3.2.5** Load variability due to weather, regional economic forecasts, etc.



Annually.

**1.3. Annual Data Retention Period.**

The Planning Coordinator shall each retain the data necessary to conduct the analysis and documentation of the latest results from such analysis along with evidence of plan implementation for five (5) years. In addition, entities found non-compliant shall keep information related to non-compliance until found compliant.

The Compliance Monitor shall keep the last audit and all subsequent compliance records.

**1.4. Additional Compliance Information.**

None specified

**2. Violation Severity Levels**

<b>R #</b>	<b>Lower VSL</b>	<b>Moderate VSL</b>	<b>High VSL</b>	<b>Severe VSL</b>
<b>R1</b>	<p>The Planning Coordinator Resource Adequacy analysis failed to consider 1 or 2 of the Resource availability characteristics subcomponents under R1.3.1 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 consider Transmission limitations and document how and why they were included in the analysis or why they were not included per R1.3.3</p>	<p>The Planning Coordinator Resource Adequacy analysis failed to express the planning reserve margin developed from R1.2 as a percentage of the net Median forecast peak Load per R1.4</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include 1 of the Resource Availability 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 Load forecast 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 appropriately accounted for</p>	<p>The Planning Coordinator Resource Adequacy analysis failed to be performed or verified separately for individual years of Year One through Year Ten per R1.1</p> <p><b>OR</b></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 though 10 year period or both per R1.2</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to include 2 or more of the Resource Availability 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 Load forecast Characteristics</p>	<p>The Planning Coordinator failed to perform and document a Resource Adequacy analysis annually per R1.</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource 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 no greater than 0.1 per R1.2</p> <p><b>OR</b></p> <p>The Planning Coordinator failed to perform an analysis for Year One per R1.2</p>

		<p>in its Resource Adequacy analysis per R1.6</p>	<p>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 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 R1.3.5</p> <p><b>OR</b></p> <p>The Planning Coordinator Resource Adequacy analysis failed to consider 3 or more Resource availability characteristics subcomponents under R1.3.1 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</p>	
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			Resource Adequacy analysis failed to document that capacity resources are appropriately accounted for in its Resource Adequacy analysis per R1.5	
<b>R2</b>	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 one of the years in the 6 through 10 year period per R1.2.	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 one of the years in the 2 through 5 year period per R1.2.	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 Year 1 per R1.2.	The Planning Coordinator did not document an assessment of its Resource Adequacy by comparing its load and resource capability per R2.

**Version History**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>