

### 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.

**Planned Reserve Sharing Group** (“PRSG”) is defined as ~~one or more Load Serving Entities (“LSEs”) or a group of Load Serving Entities (“LSEs”) LSEs that agree to study their collective resources to assess the planned Resource Adequacy for the load of the PRSG as a whole.~~

**Comment [sm1]:** Definition of PRSG is slightly different than RFC’s definition. Is there an effort with RFC to coordinate definitions?

**Comment [LLE2]:** Now it’s the same as RFC. Definition remains because of reference in R1.5.

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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-01~~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. LSEs or as delegated to: Planning Coordinator
- 4.2. Resource Planner

**Comment [LLE3]:** It is assumed that the PC will get their info from the LSE.

~~5. **Planned Reserve Sharing Group**~~

~~6. **Resource Planner**~~

- ~~7. **Effective Date:** Upon MRO Board Approval compliance monitoring for RES-501-MRO-01RES-501-MRO-02-R3 will begin. Upon Canadian provincial agency exercising regulatory authority over an MRO member and FERC approval, financial sanctions for RES-501-MRO-01RES-501-MRO-02-R3 will become effective.~~

~~One year after MRO Board Approval, compliance monitoring for RES-501-MRO-0102-R1 and RES-501-MRO-01RES-501-MRO-02-R2 will begin.~~

**Comment [sm4]:** Same comment about the Effective Date

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~~1st day of the 1st quarter following all appropriate Regulatory Authority Approvals, financial sanctions for RES-501-MRO-02-R1 and RES-501-MRO-02-R2 will become effective.~~

~~1st day of the 1st quarter following MRO Board Approval compliance with monitoring for RES-501-MRO-02-R3 will become effectivebegin.~~

~~1st day of the 1st quarter following Regulatory Approval, financial sanctions for RES-501-MRO-02-R3 will become effective.~~

- ~~5. Upon Canadian provincial agency exercising regulatory authority over an MRO member and FERC approval, financial sanctions for RES-501-MRO-01~~

~~**RES-501-MRO-02-R1 and RES-501-MRO-01RES-501-MRO-02-R2 will become effective.**~~

**B. Requirements**

- R1. ~~*[Violation Risk Factor: Medium]*~~. The LSE and/or its delegate(s) 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

**Comment [sm5]:** All requirements are missing time horizons

**Comment [sm6]:** VRF should be at the end of the requirement

**Comment [sm7]:** General comment about Requirements: the requirements are unclear and make many references at times to other requirements and other standards. Consider breaking out the requirements into concise, clearer requirements.

<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.

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.

**R1.1.1** 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.

**Comment [LLE8]:** Should be added to Glossary of Terms document?

**R1.1.2** The annual peak season for Resource Adequacy assessment is to be determined by the ~~LSE and/or its delegate~~ Planning Coordinator. The peak season is defined as a period consisting of two (2) or more calendar months but less than seven (7) calendar months, which includes the period during which the ~~LSE or its Planned Reserve Sharing Group~~ Planning Coordinator's annual peak demand is expected to occur.

~~R1.1.2.1. If the peak season is determined by the PRSG, then the peak season is to apply for the PRSG in the aggregate. If the peak season is determined by the LSE or Resource Planner, then the peak season is to apply for the LSE.~~

**R1.2** ~~Be performed to meet the assessment with 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 is done for each year of ~~the ten year period in R1.1~~ Year One through Year Ten (as defined in R1.1.1) to ensure meeting one (1) day in ten (10) years. Analysis ~~to~~ 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.

**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 ~~one (1) day in ten (10) years~~ R1.2 ~~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.

~~R1.3.1.1~~ 1 Historic resource performance and any ~~projected changes~~

~~R1.3.1.2~~ 2 Seasonal resource ratings

~~R1.3.1.3~~ 3 Modeling assumptions of non-conventional resources such as wind and cogeneration.

~~R1.3.1.4~~ 4 Energy limitations of hydroelectric units.

- ~~R1.3.1.5-5~~ Merchant plant availabilities.
- ~~R1.3.1.6-6~~ Modeling assumptions of firm capacity purchases and sales of the LSE and/or its delegates.
- ~~R1.3.1.7-7~~ Availability and deliverability of fuel.
- ~~R1.3.1.8-8~~ Common mode outages that effect resource  
adequacy
- ~~R1.3.1.9-9~~ Other environmental or regulatory restrictions —of  
resource availability.
- ~~R1.3.1.10-10~~ Available Demand-Side Management.
- ~~R1.3.1.11-11~~ Resource maintenance outage schedules.
- ~~R1.3.1.12-12~~ Sensitivity to resource outage rates and resource capabilities.
  - ~~R1.3.1.12.1-1~~ Consider impacts of extreme weather/drought  
conditions.
- ~~R1.3.2-2~~ Load Characteristics
  - ~~R1.3.2.1-1~~ Load forecasts.
  - ~~R1.3.2.2-2~~ Load forecast uncertainty.
  - ~~R1.3.2.3-3~~ Load diversity
  - ~~R1.3.2.4-4~~ Seasonal load variations.
  - ~~R1.3.2.5-5~~ Load variability due to weather, regional economic forecasts, etc.
  - ~~R1.3.2.6-6~~ Daily demand modeling assumptions (firm,  
interruptible).
- ~~R1.3.3-3~~ Transmission limitations that prevent the delivery of generation reserves.
  - ~~R1.3.3.1-1~~ Transmission maintenance outage schedules.
  - ~~R1.3.3.2-2~~ Transmission forced outage rates
  - ~~R1.3.3.3-3~~ Transmission availability for emergency,  
considering firm commitments
- ~~R1.3.4-4~~ Modeling assumptions for emergency operation procedures used during unexpected resource outages.
- ~~R1.3.5-5~~ Emergency assistance from other interconnected systems including multi-area assessment considering transmission limitations.
- ~~R1.3.6-6~~ Document and justify the inclusion of market resources not committed to serving load (uncommitted resources) within the planned Resource Adequacy Assessment analysis.
- R1.4** Express the planning reserve ~~developed from R1.2~~ as a percentage of the 50:50 probability forecast peak load (planning reserve margin).

**R1.5** Document that the resource capacity is not counted more than once as reserve by multiple ~~Load Serving Entities, and/or Planned Reserve Sharing Groups~~Planning Coordinators.

**R2.** ~~[Violation Risk Factor: Lower].~~ On an annual basis, the ~~LSE and/or its delegate(s)~~Planning Coordinator shall document an assessment of its Resource Adequacy by comparing its load and resource capability for the ten year period in R1.1 expressed as a percentage of the 50:50 probability forecast peak load with the planning reserve margin benchmark in R1.4. ~~[Violation Risk Factor: Lower] [Time Horizon: Long-Term Planning]~~

**R3.** ~~[Violation Risk Factor: Lower].~~ Each ~~LSE~~Planning Coordinator shall report to the MRO within 90 days of the 1<sup>st</sup> day of the 1<sup>st</sup> quarter following MRO Board Approval effective date of RES-501-MRO-01-R3, for each portion of its load, whether the ~~LSE or its delegate~~they will be performing the studies, providing the results, ~~and or~~ reporting, as required, in order to meet Reliability Standards ~~RES-501-MRO-01-R1 and R2~~ for that portion of its load.

If the ~~LSE~~Planning Coordinator delegates the tasks for ~~RES-501-MRO-01-R1 and R2~~ for a portion of its load, the ~~LSE~~Planning Coordinator will also indicate which ~~Planned Reserve Sharing Group, Group or entity or Resource Planner~~entities it delegated the tasks for ~~Reliability Standard RES-501-MRO-01-R1 and R2~~ for that portion of its load. If a ~~LSE~~Planning Coordinator changes the ~~Entity(ies)~~party to which the tasks were delegated, the ~~Planning Coordinator~~LSE shall notify the MRO at least 90 days prior to the proposed change or 180 days prior to the planning period under review, whichever is greater. The ~~Planning Coordinator~~LSE does not have to delegate all of the tasks in Reliability Standards ~~RES-501-MRO-01-R1 and R2~~ to the same party. The LSE shall provide the MRO with evidence of acceptance of the delegation by the applicable party. All delegations are subject to verification by the MRO.

A LSE can meet this requirement for a portion of its load by providing confirmation in accordance with the reporting time requirements outlined in RES-501-MRO-01-R3 that, for that portion of its load, the LSE's load is in a Balancing Authority Area that accounts for the LSE's load in its planning process and that the Balancing Authority is a member of a Planned Reserve Sharing Group. ~~[Violation Risk Factor: Lower] [Time Horizon: Operations Planning]~~

**C. Measures**

- M1.** The ~~Planning Coordinator~~LSE and/or its delegate(s) shall ~~have a~~ provide documented evidence of a valid planned Resource Adequacy assessment covering the 10 year planning horizon per ~~RES-501-MRO-01-R1~~.
- M2.** The ~~Planning Coordinator~~LSE and/or its delegate(s) shall ~~have~~ provide documented evidence that it performed an annual assessment of its Resource Adequacy for Year One through Year Ten ~~it has completed all the reports as required in RES-501-MRO-01-R2, and RES-501-MRO-01-R3.~~
- M2.M3.** The ~~Planning Coordinator~~shall provide the MRO with documented evidence of acceptance by the entity(ies) ~~applicable party to be performing the annual Resource Adequacy Assessment for Year One through Ten.~~

**Comment [sm9]:** In general, these Measures do not clarify what is to be provided as evidence that the Requirement was met but rather only refers back to the Requirement. These Measures should be clearer.

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If the Planning Coordinator delegates the tasks, the Planning Coordinator shall provide evidence that, for that portion of its load, the LSE's load is in a Balancing Authority Area that accounts for the Planning Coordinator's load in its planning process and that the Balancing Authority is a coordinating with the Planning Coordinator member of a Planned Reserve Sharing Group.

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1. Compliance Monitoring Responsibility.**

-ERO delegated to Midwest Reliability Organization.

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

-Annually.

Comment [LLE10]: Is this a calendar year?

**1.3. Annual Data Retention Period.**

-The MRO and the LSE and/or its delegate(s) 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><u>The assessment performed is missing one or two of the sub-requirements.</u></p> <p><b>OR</b></p> <p><u>The assessment was not performed annually in Year One through Ten.</u></p>	<p><u>The assessment was missing over half of the sub-requirements.</u></p> <p><b>OR</b></p> <p><u>The assessment was performed accurately but documentation was not complete.</u></p>	<u>Not Applicable</u>	<u>A Valid assessment was not performed and documentation was not provided.</u>
<b>R2</b>	<u>The Entity performed an annual comparison of its resource capability and planning reserve margin for at least 9 years of the 10 year period.</u>	<u>The Entity performed an annual comparison of its resource capability and planning reserve margin for at least half of the 10 year period.</u>	<u>Not Applicable</u>	<u>The Entity did not perform an annual comparison of its resource capability and planning reserve margin.</u>

Comment [sm11]: Not in the table format used in the cws – not consistent with how standards are being written  
[ftp://www.nerc.com/pub/sys/all\\_updl/standards/dt/Reliability\\_Standard\\_Template\\_Guide.dot](ftp://www.nerc.com/pub/sys/all_updl/standards/dt/Reliability_Standard_Template_Guide.dot)

Comment [LLE12]: The correct link for this example is  
[www.nerc.com/files/Reliability\\_Standard\\_Template\\_Guide.dot](http://www.nerc.com/files/Reliability_Standard_Template_Guide.dot)

<b>R3</b>	<u>The Entity did not identify who would be performing the study for their area within 90 days of the Effective Date.</u>	<u>The Entity did not identify who would be performing the study for their area.</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
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**Lower** — The reporting requirement of RES-501-MRO-01\_R3 was not met.

**Moderate** — A valid assessment was not performed in accordance with RES-501-MRO-01\_R2.

**High** — Not Applicable.

**Severe** — A valid assessment was not performed in accordance with RES-501-MRO-01\_R1.

**Version History**

Version	Date	Action	Change Tracking