

DRAFT Reliability Standard Audit Worksheet¹

VAR-001-4 – Voltage and Reactive Control

This section to be completed by the Compliance Enforcement Authority.

Audit ID: Audit ID if available; or REG-NCRnnnnn-YYYYMMDD
Registered Entity: Registered name of entity being audited
NCR Number: NCRnnnnn
Compliance Enforcement Authority: Region or NERC performing audit
Compliance Assessment Date(s)²: Month DD, YYYY, to Month DD, YYYY
Compliance Monitoring Method: Audit
Names of Auditors: Supplied by CEA

Applicability of Requirements *[RSAW developer to insert correct applicability]*

	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R1													X		
R2													X		
R3													X		
R4													X		
R5													X		
R6													X		

¹ NERC developed this Reliability Standard Audit Worksheet (RSAW) language in order to facilitate NERC’s and the Regional Entities’ assessment of a registered entity’s compliance with this Reliability Standard. The NERC RSAW language is written to specific versions of each NERC Reliability Standard. Entities using this RSAW should choose the version of the RSAW applicable to the Reliability Standard being assessed. While the information included in this RSAW provides some of the methodology that NERC has elected to use to assess compliance with the requirements of the Reliability Standard, this document should not be treated as a substitute for the Reliability Standard or viewed as additional Reliability Standard requirements. In all cases, the Regional Entity should rely on the language contained in the Reliability Standard itself, and not on the language contained in this RSAW, to determine compliance with the Reliability Standard. NERC’s Reliability Standards can be found on NERC’s website. Additionally, NERC Reliability Standards are updated frequently, and this RSAW may not necessarily be updated with the same frequency. Therefore, it is imperative that entities treat this RSAW as a reference document only, and not as a substitute or replacement for the Reliability Standard. It is the responsibility of the registered entity to verify its compliance with the latest approved version of the Reliability Standards, by the applicable governmental authority, relevant to its registration status.

The NERC RSAW language contained within this document provides a non-exclusive list, for informational purposes only, of examples of the types of evidence a registered entity may produce or may be asked to produce to demonstrate compliance with the Reliability Standard. A registered entity’s adherence to the examples contained within this RSAW does not necessarily constitute compliance with the applicable Reliability Standard, and NERC and the Regional Entity using this RSAW reserves the right to request additional evidence from the registered entity that is not included in this RSAW. Additionally, this RSAW includes excerpts from FERC Orders and other regulatory references. The FERC Order cites are provided for ease of reference only, and this document does not necessarily include all applicable Order provisions. In the event of a discrepancy between FERC Orders, and the language included in this document, FERC Orders shall prevail.

² Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs.

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Subject Matter Experts

Identify Subject Matter Expert(s) responsible for this Reliability Standard. (Insert additional rows if necessary)

Registered Entity Response (Required):

SME Name	Title	Organization	Requirement(s)

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R1 Supporting Evidence and Documentation

R1. Each Transmission Operator shall specify a system voltage schedule (which is either a range or a target value with an associated tolerance band) as part of its plan to operate within System Operating Limits and Interconnection Reliability Operating Limits.

1.1. Each Transmission Operator shall provide a copy of the voltage schedules and associated tolerance bands to its Reliability Coordinator and adjacent Transmission Operators within 30 calendar days of a request.

M1. The Transmission Operator shall have evidence that it specified system voltage schedules using either a range or a target value with an associated tolerance band.

For part 1.1, the Transmission Operator shall have evidence that the voltage schedules were provided to its Reliability Coordinator and adjacent Transmission Operators within 30 days of a request. Evidence may include, but is not limited to, emails, website postings, and meeting minutes.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested³:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

See M1.

Documentation of request made per Part 1.1 from Reliability Coordinator and/or adjacent Transmission Operators, if applicable and requested by auditor.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:
File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description
Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

³ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R1

This section to be completed by the Compliance Enforcement Authority

	The RSAW Developer will complete this section with a set of detailed steps for the audit process. See the RSAW Developer’s Guide for more information.
	(R1) Review evidence provided and ensure it meets the requirements outlined in Requirement R1.
	(Part 1.1) Examine evidence to verify that voltage schedules were provided within 30 days of request per Part 1.1.

Note to Auditor: Auditors, at their discretion and based on the risk of the entity’s compliance with this requirement to the BES, may communicate with Balancing Authorities and other Transmission Operators to determine if data requests were made of the entity. Auditors may also accept entity assertions regarding whether data requests made.

Entity assertions that no data requests were made do not have to be in writing.

Auditor Notes:

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R2 Supporting Evidence and Documentation

- R2.** Each Transmission Operator shall schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions. Transmission Operators can provide sufficient reactive resources through various means including, but not limited to, reactive generation scheduling, transmission line and reactive resource switching, and using controllable load.
- M2.** Each Transmission Operator shall have evidence of scheduling sufficient reactive resources based on their assessments of the system. For the operational planning time horizon, Transmission Operators shall provide copies of assessments used as the basis for how resources were scheduled.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

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Evidence Requested⁴:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

See M2.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:

File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description

Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R2

This section to be completed by the Compliance Enforcement Authority

	The RSAW Developer will complete this section with a set of detailed steps for the audit process. See the RSAW Developer's Guide for more information.
	Review the studies/assessments that entity used to schedule resources to determine that the studies show whether new resources should be brought online, or if the resources online are sufficient to regulate voltage levels. Auditors should verify that actual scheduling reflected the results of the studies/assessments.

⁴ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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Note to Auditor: Based on the risk of the entity's compliance with this requirement on the Bulk Electric System (BES) and the auditor's assessment of the entity's management practices (or internal controls) over compliance with this Requirement, auditors will determine the extent of the above audit procedures to apply. In cases where risk to the BES is low and the entity's management practices, gleaned by the auditor through walkthroughs or documentation review, are sound, only limited audit testing is necessary. In cases where risk is higher and controls are less effective, an auditor should sample enough instances, per above, to gain reasonable assurance that entity is complying with Requirement R2.

Auditor Notes:

R3 Supporting Evidence and Documentation

- R3.** Each Transmission Operator shall operate or direct the Real-time operation of devices to regulate transmission voltage and reactive flow as necessary.
- M3.** Each Transmission Operator shall have evidence that actions were taken to operate capacitive and inductive resources as needed in Real-time. This may include directions to Generator Operators to: 1) provide additional voltage support; 2) bring resources on-line; or 3) make manual adjustments.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested⁵:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

Any written policies, procedures or protocols describing how the entity operates or directs devices to regulate transmission voltage and reactive flow as necessary, if the entity has such documents.

Evidence as outlined in M3 as requested by auditor.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:

File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description

Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location

⁵ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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where evidence of compliance may be found.

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R3

This section to be completed by the Compliance Enforcement Authority

Review evidence to understand how entity operates or directs devices to regulate transmission voltage and reactive flow as necessary. Auditors may sample system events or other instances of voltage irregularities to verify that operations or directions occurred as required per Requirement R2.

Note to Auditor: Based on the risk of the entity's compliance with this requirement on the Bulk Electric System (BES) and the auditor's assessment of the entity's management practices (or internal controls) over compliance with this Requirement, auditors will determine the extent of the above audit procedures to apply. In cases where risk to the BES is low and the entity's management practices, gleaned by the auditor through walkthroughs or documentation review, are sound, only limited audit testing is necessary. In cases where risk is higher and controls are less effective, an auditor should sample enough events or other instances of voltage irregularities, per above, to gain reasonable assurance that entity is complying with Requirement R2.

Auditor Notes:

R4 Supporting Evidence and Documentation

R4. The Transmission Operator shall specify the criteria that will exempt generators from compliance with the requirements defined in Requirement R5, part 5.1, and any associated notification requirements.

4.1 If a Transmission Operator determines that a generator has satisfied the exemption criteria, it shall notify the associated Generator Operator.

M4. Each Transmission Operator shall have evidence of the documented criteria for generator exemptions.

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For part 4.1, the Transmission Operator shall also have evidence to show that, for each generating unit in its area that is exempt from: 1) following a voltage or Reactive Power schedule, 2) from having its automatic voltage regulator (AVR) in service or from being in voltage control mode, or 3) from having to make any notifications, the associated Generator Operator was notified of this exemption.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested⁶:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

See M4.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:
File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description
Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R4

This section to be completed by the Compliance Enforcement Authority

	The RSAW Developer will complete this section with a set of detailed steps for the audit process. See the RSAW Developer's Guide for more information.
	(R4) Review evidence and note existence of exemption criteria per Requirement R4. For a sample of exempted generators, verify that exemption was granted in accordance with criteria.

⁶ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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(Part 1.1) For a sample of exempted generators, ensure exempted generator was notified.

Note to Auditor: Based on the risk of the entity's compliance with this requirement on the Bulk Electric System (BES) and the auditor's assessment of the entity's management practices (or internal controls) over compliance with this Requirement, auditors will determine the extent of the above audit procedures to apply. In cases where risk to the BES is low and the entity's management practices, gleaned by the auditor through walkthroughs or documentation review, are sound, only limited audit testing is necessary. In cases where risk is higher and controls are less effective, an auditor should sample enough generators, per above, to gain reasonable assurance that entity is complying with Requirement R4.

Requirement R4 allows for any combination of exemptions for generator operators from 1) voltage schedules, 2) being in automatic voltage control mode, or 3) any notification requirements, as long as the exemption meets the criteria specified by the entity. An auditor will not look for any pre-authorization from the entity; rather an auditor will verify that the generator operator has met the criteria set forth by the entity.

Auditor Notes:

R5 Supporting Evidence and Documentation

- R5.** Each Transmission Operator shall specify a voltage or Reactive Power schedule (which is either a range or a target value with an associated tolerance band) at either the high voltage side or low voltage side of the Generator Step-Up transformer at the Transmission Operator's discretion.
- 5.1.** The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (the AVR is in service and controlling voltage).
- 5.2.** The Transmission Operator shall provide the Generator Operator with the notification requirements for deviations from the voltage or Reactive Power schedule.
- 5.3.** The Transmission Operator shall provide the criteria used to develop voltage schedules and associated tolerance bands to the Generator Operator within 30 days of receiving a request.
- M5.** The Transmission Operator shall have evidence of a documented voltage or Reactive Power Schedule and tolerance band.

For part 5.1, the Transmission Operator shall have evidence it provided a voltage or Reactive Power schedule and tolerance band to the applicable Generator Operators, and that the Generator Operator was directed to comply with the schedule in automatic voltage control mode, unless exempted. The evidence shall include written records, email, or voice recordings.

For part 5.2, the Transmission Operator shall have evidence it provided notification requirements for deviations from the voltage or Reactive Power schedule and associated tolerance band. The evidence shall include written records, email, or voice recordings.

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For part 5.3, the Transmission Operator shall have evidence it provided the criteria used to develop voltage schedules and associated tolerance bands within 30 days of receiving a request by a Generator Operator.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested⁷:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

See M5.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:
File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description
Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R5

This section to be completed by the Compliance Enforcement Authority

	The RSAW Developer will complete this section with a set of detailed steps for the audit process. See the RSAW Developer's Guide for more information.
	(R5) Verify existence of voltage or Reactive Power schedule and that it meets the requirements of Requirement R5.
	(Part 5.1) For a sample of Generator Operators, verify voltage or Reactive Power schedule was provided

⁷ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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	per Part 5.1.
	(Part 5.2) For a sample of Generator Operators, verify the notification requirements for deviations from the voltage or Reactive Power schedule was provided per Part 5.2.
	(Part 5.3) For a sample of Generator Operators, verify criteria was provided as requested per Part 5.3.

Note to Auditor: Based on the risk of the entity's compliance with this requirement on the Bulk Electric System (BES) and the auditor's assessment of the entity's management practices (or internal controls) over compliance with this Requirement, auditors will determine the extent of the above audit procedures to apply. In cases where risk to the BES is low and the entity's management practices, gleaned by the auditor through walkthroughs or documentation review, are sound, only limited audit testing is necessary. In cases where risk is higher and controls are less effective, an auditor should sample enough notifications, per above, to gain reasonable assurance that entity is complying with Requirement R5.

It is clear based on VAR-001-4 Requirement R5 that a voltage or Reactive power schedule can be either: 1) a target number with a tolerance band, Or 2) a voltage or Reactive Power range to operate within. An auditor would not expect to see a tolerance band provided with an operating range for voltage or Reactive Power.

Auditor Notes:

R6 Supporting Evidence and Documentation

- R6.** After consultation with the Generator Owner regarding necessary step-up transformer tap changes and the implementation schedule, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes, and technical justification for these changes.
- M6.** The Transmission Operator shall have evidence that it provided documentation to the Generator Owner when a change was needed to a generating unit's step-up transformer tap in accordance with the requirement and that it consulted with the Generator Owner.

Registered Entity Response to General Compliance with this Requirement (Required):

Describe, in narrative form, how you meet compliance with this Requirement. Provide a brief explanation, in your own words, of how you meet compliance with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested⁸:

Provide the following evidence, or other evidence to demonstrate compliance. If the provisioning of this evidence is burdensome or otherwise unreasonable, contact your CEA to arrange for sampling or other means of reduction of the quantity of evidence submitted.

⁸ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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See M6.

Registered Entity Evidence (Required):

The following information is recommended for all evidence submitted:
File Name, Document Title, Revision, Date, Page(s), Section(s), Section Title(s), Description
Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to VAR-001-4, R6

This section to be completed by the Compliance Enforcement Authority

	The RSAW Developer will complete this section with a set of detailed steps for the audit process. See the RSAW Developer’s Guide for more information.
	Understand entity’s procedures concerning coordinating tap settings with Generator Owners per Requirement R6.
	For a sample of Generator Owners, verify tap setting changes were executed per Requirement R6.

Note to Auditor: Based on the risk of the entity’s compliance with this requirement on the Bulk Electric System (BES) and the auditor’s assessment of the entity’s management practices (or internal controls) over compliance with this Requirement, auditors will determine the extent of the above audit procedures to apply. In cases where risk to the BES is low and the entity’s management practices, gleaned by the auditor through walkthroughs or documentation review, are sound, only limited audit testing is necessary. In cases where risk is higher and controls are less effective, an auditor should sample enough tap setting communications, per above, to gain reasonable assurance that entity is complying with Requirement R6.

Auditor Notes:

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Revision History

Version	Date	Reviewers	Revision Description
1	11/07/2013	NERC compliance, Standards	New Document

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