

**Compliance Questionnaire and**

**Reliability Standard Audit Worksheet**

**TOP-004-2 — Transmission Operations**

**Registered Entity:** *(Must be completed by the Compliance Enforcement Authority)*

**NCR Number:** *(Must be completed by the Compliance Enforcement Authority)*

**Applicable Function(s): TOP**

**Auditors:**

**Disclaimer**

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 at <http://www.nerc.com/page.php?cid=2|20>. 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.

Subject Matter Experts

Identify your company’s subject matter expert(s) responsible for this Reliability Standard. Include the person's title, organization and the requirement(s) for which they are responsible. Insert additional lines if necessary.

**Response: *(Registered Entity Response Required)***

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| **SME Name** | **Title** | **Organization** | **Requirement** |
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Reliability Standard Language

 **TOP‑004‑2 ‑ Transmissions Operations**

**Purpose:**

To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single Contingency and specified multiple Contingencies.

**Applicability:**

 Transmission Operator

**NERC BOT Approval Date: 11/1/2006**

**FERC Approval Date: 1/22/09**

**Reliability Standard Enforcement Date in the United States: 1/22/09**

**Requirements:**

1. Each **Transmission Operator** shall operate within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs).

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R1 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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| *Audit Team: Additional Evidence Reviewed:* |  |  |
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***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP‑004‑2 R1.**

 \_\_\_ Evaluate the evidence to determine if the Transmission Operator operated within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs).

**Detailed notes:**

1. Each **Transmission Operator** shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R2 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP‑004‑2 R2.**

 \_\_\_Evaluate the evidence to confirm if the Transmission Operator operated such that instability, uncontrolled separation, or cascading outages could not occur as a result of the most severe single contingency.

**Detailed notes:**

**Additional Evidence Reviewed:**

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1. Each **Transmission Operator** shall operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by its Reliability Coordinator.

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R3 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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 ***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP‑004‑2 R3.**

 \_\_\_Have the Transmission Operator provide evidence that it operated to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages as specified by its Reliability Coordinator.

**Detailed notes:**

1. If a **Transmission Operator** enters an unknown operating state (i.e. any state for which valid operating limits have not been determined), it will be considered to be in an emergency and shall restore operations to respect proven reliable power system limits within 30 minutes.

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R4 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP‑004‑2 R4.**

 \_\_\_Determine if the Transmission Operator has entered an unknown operating state for the period being audited.

 \_\_\_If yes, determine if the Transmission Operator considered itself to be in an emergency.

 \_\_\_Determine if the Transmission Operator restored operations to respect proven reliable power system limits within 30 minutes.

**Detailed notes:**

1. Each **Transmission Operator** shall make every effort to remain connected to the Interconnection. If the Transmission Operator determines that by remaining interconnected, it is in imminent danger of violating an IROL or SOL, the Transmission Operator may take such actions, as it deems necessary, to protect its area.

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R5 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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| *Audit Team: Additional Evidence Reviewed:* |  |  |
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 ***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP‑004‑2 R5.**

 \_\_\_Has the Transmission Operator had to initiate a manual separation during the audit period?

 In the event of manual separation:

 \_\_\_Determine what efforts were made to remain connected to the Interconnection.

 \_\_\_What methodology or criteria was used to determine that by remaining interconnected it was in imminent danger of violating an IROL or SOL?

**Detailed notes:**

**R6.** Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including:

**R6.1.** Monitoring and controlling voltage levels and real and reactive power flows.

**R6.2.** Switching transmission elements.

**R6.3.** Planned outages of transmission elements.

**R6.4.** Responding to IROL and SOL violations.

**Describe, in narrative form, how you meet compliance with this requirement: *(Registered Entity Response Required)***

# R6 Supporting Evidence and Documentation

**Response: *(Registered Entity Response Required)***

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| *Audit Team: Additional Evidence Reviewed:* |  |  |
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***This section must be completed by the Compliance Enforcement Authority.***

**Compliance Assessment Approach Specific to TOP-004-2 R6:**

 \_\_\_ Review the formal policies and procedures to provide for transmission reliability, and verify they have been developed, maintained, and implemented individually and jointly with adjacent Transmission Operators.

 \_\_\_ Ensure that the policies include:

\_\_\_ Addressing the execution and coordination of activities that impact inter-and intra

regional reliability

 \_\_\_

 \_\_\_ Monitoring and Controlling Voltages and real and reactive power flows

 \_\_\_ Switching transmission elements

 \_\_\_ Planned outages of transmission elements

 \_\_\_ Responding to IROL and SOL violations

**Detailed notes:**

Supplemental Information

**Other ‑** The list of questions above is not all inclusive of evidence required to show compliance with the Reliability Standard. Provide additional information here**, as necessary that** demonstrates compliance with this Reliability Standard.

 **Entity** **Response: *(Registered Entity Response)***

# Compliance Findings Summary (to be filled out by auditor)

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| **Req.** | **NF** | **PV** | **OEA** | **NA** | **Statement** |
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**Excerpts From FERC Orders -- For Reference Purposes Only**

**Updated Through March 31, 2009**

**TOP-004-1**

**Order 693**

P 1567. The eight Transmission Operations (TOP) Reliability Standards apply to transmission operators, generator operators and balancing authorities. The goal of these Reliability Standards is to ensure that the transmission system is operated within operating limits. Specifically, these Reliability Standards cover the responsibilities and decision-making authority for reliable operations, requirements for operations planning, planned outage coordination, real-time operations, provision of operating data, monitoring of system conditions, reporting of operating limit violations and actions to mitigate such violations. The Interconnection Reliability Operations and Coordination (IRO) group of Reliability Standards complement these proposed TOP Reliability Standards.

P 1627. This Reliability Standard requires transmission operators to operate the transmission system within SOL and IROL. The N-1 operating criterion for the transmission system is also established in this Reliability Standard. It provides that operating configurations for which limits have not yet been determined should be treated as emergencies. The goal of the Reliability Standard is to maintain Bulk-Power System facilities within limits, thereby protecting transmission, generation, distribution and customer equipment and preventing cascading failures of the interconnected grid.

P 1629. Requirement R3 requires that each transmission operator shall, when practical, operate the system to respect multiple outages as specified by the regional reliability organization policy….

P 1635. The Commission approves TOP-004-0 as mandatory and enforceable until October 1, 2007, when TOP-004-1 will be mandatory and enforceable….

P 1636…Requirement R4 of TOP-004-1 (as well as the Version 0 standard) provides that if a transmission operator enters an unknown state, i.e., any state for which valid operating limits have not been determined, operations should be restored to respect proven reliable power system limits within 30 minutes….

P 1638. As mentioned above, the Commission proposed to interpret “multiple outages” in the context of Requirement R3 to include multiple element outages resulting from high-risk conditions such as hurricanes, wild fires, ice storms or periods of high solar magnetic disturbances during which the probability of multiple outages approaches that of a single element outage. This is not an exhaustive list but is meant to contain illustrative examples, and the Reliability Standards development process should develop a procedure to identify applicable high risk conditions. Under the high-risk conditions, the Commission understands that systems are normally operated in a more secure manner so that the Bulk-Power System can withstand multiple outages. These multiple outages exceed the normal N-1 criterion because the probability of multiple outages during high-risk conditions approaches that of a single outage during normal conditions….

P 1640. Accordingly, the Commission approves Reliability Standard TOP-004-0….

**Revision History**

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| --- | --- | --- | --- |
| **Version** | **Date** | **Reviewers** | **Revision Description** |
| 1 | October 2009 | RSAW Working Group | New Document. |
| 1 | December 2010 | RSAW Working Group | Revised Findings Table, modified Supporting Evidence tables, and added Revision History. |
| 1 | January 2011 | Craig Struck | Reviewed for format consistency and content. |
| 1.1 | September 2011 | Craig Struck | Format changes for 2011. |
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