

Reliability Standard Audit Worksheet¹

TOP-001-4 – Transmission Operations

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: [On-site Audit | Off-site Audit | Spot Check]
Names of Auditors: Supplied by CEA

Applicability of Requirements

	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R1													X		
R2	X														
R3	X	X		X											
R4	X	X		X											
R5		X		X									X		
R6		X		X									X		
R7													X		
R8													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.

DRAFT NERC Reliability Standard Audit Worksheet

	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R9	X												X		
R10													X		
R11	X														
R12													X		
R13													X		
R14													X		
R15													X		
R16													X		
R17	X														
R18													X		
R19													X		
R20													X		
R21													X		
R22	X														
R23	X														
R24	X														

Legend:

Text with blue background:	Fixed text – do not edit
Text entry area with Green background:	Entity-supplied information
Text entry area with white background:	Auditor-supplied information

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Findings

(This section to be completed by the Compliance Enforcement Authority)

Req.	Finding	Summary and Documentation	Functions Monitored
R1			
R2			
R3			
R4			
R5			
R6			
R7			
R8			
R9			
R10			
R11			
R12			
R13			
R14			
R15			
R16			
R17			
R18			
R19			
R20			
R21			
R22			
R23			
R24			

Req.	Areas of Concern

Req.	Recommendations

Req.	Positive Observations

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Subject Matter Experts

Identify the Subject Matter Expert(s) responsible for this Reliability Standard.

Registered Entity Response (Required; Insert additional rows if needed):

SME Name	Title	Organization	Requirement(s)

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R1 Supporting Evidence and Documentation

R1. Each Transmission Operator shall act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions.

M1. Each Transmission Operator shall have and provide evidence which may include but is not limited to dated operator logs, dated records, dated and time-stamped voice recordings or dated transcripts of voice recordings, electronic communications, or equivalent documentation, that will be used to determine that it acted to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Evidence, which may include but is not limited to, operator logs, dated records, dated and time-stamped voice recordings or dated transcripts of voice recordings, electronic communications, or equivalent documentation that the Transmission Operator acted, or issued Operating Instructions, to address reliability within its Area.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

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

This section to be completed by the Compliance Enforcement Authority

	(R1) For a sample of BES events selected by the auditor, review evidence and verify the entity acted, or issued Operating Instructions, to maintain the reliability of its Transmission Operator Area.
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Note to Auditor:

Auditor Notes:

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R2 Supporting Evidence and Documentation

- R2.** Each Balancing Authority shall act to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions.
- M2.** Each Balancing Authority shall have and provide evidence which may include but is not limited to dated operator logs, dated records, dated and time-stamped voice recordings or dated transcripts of voice recordings, electronic communications, or equivalent documentation, that will be used to determine that it acted to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions.

Compliance Narrative (Required):

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

Evidence Requested ¹:

Provide the following evidence, or other evidence to demonstrate compliance.
Evidence which may include but is not limited to dated operator logs, dated records, dated and time-stamped voice recordings or dated transcripts of voice recordings, electronic communications, or equivalent documentation, that the entity acted, or issued Operating Instructions, to address reliability within its Reliability Coordinator Area.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.					
File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

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

This section to be completed by the Compliance Enforcement Authority

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	(R2) For a sample of BES events selected by the auditor, review evidence and verify the entity acted, or issued Operating Instructions to maintain the reliability of its Balancing Authority Area.
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Note to Auditor:

Auditor Notes:

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R3 Supporting Evidence and Documentation

- R3.** Each Balancing Authority, Generator Operator, and Distribution Provider shall comply with each Operating Instruction issued by its Transmission Operator(s), unless such action cannot be physically implemented or it would violate safety, equipment, regulatory, or statutory requirements.
- M3.** Each Balancing Authority, Generator Operator, and Distribution Provider shall make available upon request, evidence that it complied with each Operating Instruction issued by the Transmission Operator(s) unless such action could not be physically implemented or it would have violated safety, equipment, regulatory, or statutory requirements. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format. In such cases, the Balancing Authority, Generator Operator, Distribution Provider, and Load-Serving Entity shall have and provide copies of the safety, equipment, regulatory, or statutory requirements as evidence for not complying with the Transmission Operator's Operating Instruction. If such a situation has not occurred, the Balancing Authority, Generator Operator, Distribution Provider, or Load-Serving Entity may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity receive an Operating Instruction from a Transmission Operator during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of instances of receiving Operating Instructions from a TOP and evidence to demonstrate compliance.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

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

Evidence Requested ³:

Provide the following evidence, or other evidence to demonstrate compliance.

Evidence which could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format showing that entity complied with each Operating Instruction issued by its Transmission Operator(s), unless such action could not be physically implemented or would have violated safety, equipment, regulatory, or statutory requirements.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

DRAFT NERC Reliability Standard Audit Worksheet

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

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

This section to be completed by the Compliance Enforcement Authority

	(R3) For all, or a sample of, BES events selected by the auditor, review evidence and verify the entity complied with Operating Instructions issued by its Transmission Operator(s) unless such action could not be physically implemented or it would have violated safety equipment, regulatory, or statutory requirements.
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R4 Supporting Evidence and Documentation

- R4.** Each Balancing Authority, Generator Operator, and Distribution Provider shall inform its Transmission Operator of its inability to comply with an Operating Instruction issued by its Transmission Operator.
- M4.** Each Balancing Authority, Generator Operator, and Distribution Provider shall make available upon request, evidence which may include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or equivalent evidence in electronic or hard copy format, that it informed its Transmission Operator of its inability to comply with its Operating Instruction issued. If such a situation has not occurred, the Balancing Authority, Generator Operator, or Distribution Provider may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity receive an Operating Instruction from a Transmission Operator where compliance with the Operating Instruction could not be physically implemented or such actions would violate safety, equipment, regulatory, or statutory requirements during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of instances of receiving Operating Instructions from a Transmission Operator that could not be implemented and evidence of compliance with Requirement R4.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Evidence which could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format showing that the entity informed its Transmission Operator of its inability to comply with its Operating Instruction.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s)	Description of Applicability of Document
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DRAFT NERC Reliability Standard Audit Worksheet

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

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

This section to be completed by the Compliance Enforcement Authority

	(R4) If the entity was unable to comply with the Operating Instruction(s), determine if it informed the Transmission Operator(s).
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R5 Supporting Evidence and Documentation

- R5.** Each Transmission Operator, Generator Operator, and Distribution Provider shall comply with each Operating Instruction issued by its Balancing Authority, unless such action cannot be physically implemented or it would violate safety, equipment, regulatory, or statutory requirements.
- M5.** Each Transmission Operator, Generator Operator, and Distribution Provider shall make available upon request, evidence that it complied with each Operating Instruction issued by the Balancing Authority(s) unless such action could not be physically implemented or it would have violated safety, equipment, regulatory, or statutory requirements. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format. In such cases, the Transmission Operator, Generator Operator, and Distribution Provider shall have and provide copies of the safety, equipment, regulatory, or statutory requirements as evidence for not complying with the Balancing Authority's Operating Instruction. If such a situation has not occurred, the Transmission Operator, Generator Operator, or Distribution Provider may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity receive an Operating Instruction from the Balancing Authority during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of instances of receiving Operating Instructions from the Balancing Authority and evidence to demonstrate compliance.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Evidence which could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format showing that the entity complied with each Operating Instruction issued by its Balancing Authority.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

DRAFT NERC Reliability Standard Audit Worksheet

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

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

This section to be completed by the Compliance Enforcement Authority

	(R5) For a sample of BES events selected by the auditor, review evidence and verify the entity complied with Operating Instructions issued by its Balancing Authority unless such action could not be physically implemented or it would have violated safety equipment, regulatory, or statutory requirements.
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R6 Supporting Evidence and Documentation

- R6.** Each Transmission Operator, Generator Operator, and Distribution Provider shall inform its Balancing Authority of its inability to comply with an Operating Instruction issued by that Balancing Authority.
- M6.** Each Transmission Operator, Generator Operator, and Distribution Provider shall make available upon request, evidence which may include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or equivalent evidence in electronic or hard copy format, that it informed its Balancing Authority of its inability to comply with its Operating Instruction. If such a situation has not occurred, the Transmission Operator, Generator Operator, or Distribution Provider may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity receive an Operating Instruction from the Balancing Authority where compliance with the Operating Instruction could not be physically implemented or such actions would have violated safety, equipment, regulatory, or statutory requirements during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of instances of receiving Operating Instructions from the Balancing Authority that could not be implemented and evidence of compliance with Requirement R6.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Evidence which could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format showing that an entity informed its Balancing Authority of its inability to comply with its Operating Instruction, if the entity was unable to comply with the Operating Instruction.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s)	Description of Applicability of Document
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DRAFT NERC Reliability Standard Audit Worksheet

				or Section(s)	

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

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

This section to be completed by the Compliance Enforcement Authority

	(R6) If the entity was unable to comply with the Operating Instructions, determine if it informed the Balancing Authority that it couldn't comply.
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R7 Supporting Evidence and Documentation

- R7.** Each Transmission Operator shall assist other Transmission Operators within its Reliability Coordinator Area, if requested and able, provided that the requesting Transmission Operator has implemented its comparable Emergency procedures, unless such assistance cannot be physically implemented or would violate safety, equipment, regulatory, or statutory requirements.
- M7.** Each Transmission Operator shall make available upon request, evidence that comparable requested assistance, if able, was provided to other Transmission Operators within its Reliability Coordinator Area unless such assistance could not be physically implemented or would have violated safety, equipment, regulatory, or statutory requirements. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence in electronic or hard copy format. If no request for assistance was received, the Transmission Operator may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity receive a request to provide assistance to another Transmission Operator during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list such requests and state if the assistance was provided. If assistance was not provided, state the reasons such assistance was not provided.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Dated operator logs, voice records (or transcripts), electronic communications, or other equivalent evidence in electronic or hard copy format. If no request for assistance was received, an attestation may be provided.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s)	Description of Applicability of Document
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DRAFT NERC Reliability Standard Audit Worksheet

				or Section(s)	

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

Compliance Assessment Approach Specific to TOP-001-4, R7

This section to be completed by the Compliance Enforcement Authority

	(R7) For all a sample of BES events selected by the auditor, review evidence and verify the entity assisted other Transmission Operators, if requested and able, in accordance with Requirement R7.
<p>Note to Auditor: Auditors are advised to monitor compliance with Requirement R7 during events, due to the importance of Transmission Operator assistance in such instances. Auditors can obtain a population of events for sampling from NERC’s, or the Regional Entity’s records of mandatory event reports, other information available at the Regional Entities, or a query of the entity. Auditors are encouraged to monitor compliance during the most critical events on the entity’s system occurring during the compliance monitoring period.</p>	

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R8 Supporting Evidence and Documentation

- R8.** Each Transmission Operator shall inform its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of its actual or expected operations that result in, or could result in, an Emergency.
- M8.** Each Transmission Operator shall make available upon request, evidence that it informed its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of its actual or expected operations that result in, or could result in, an Emergency. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence. If no such situations have occurred, the Transmission Operator may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity encounter any expected operations that could have resulted in an Emergency, or that did result in an actual Emergency, during the compliance monitoring period?

Yes No

If No, explain how this was ascertained. If Yes, provide a list of such instances and evidence of compliance.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (such as outlined in M8) to support that the entity informed its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of the actual or expected operations that result in, or could result in, an Emergency.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document
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DRAFT NERC Reliability Standard Audit Worksheet

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

Compliance Assessment Approach Specific to TOP-001-4, R8

This section to be completed by the Compliance Enforcement Authority

	(R8) Obtain a list of dates and times that the entity experienced operational conditions that could or did result in an Emergency.
	(R8) For all or a sample of Emergencies, review documentary evidence to determine if the entity informed its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of the actual or expected operations that could result in, or did result in, an Emergency.

Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R9 Supporting Evidence and Documentation

- R9.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator and known impacted interconnected entities of all planned outages, and unplanned outages of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels between the affected entities.
- M9.** Each Balancing Authority and Transmission Operator shall make available upon request, evidence that it notified its Reliability Coordinator and known impacted interconnected entities of all planned outages, and unplanned outages of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence. If such a situation has not occurred, the Balancing Authority or Transmission Operator may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity encounter any planned or unplanned outages of 30 minutes or more of telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between itself and another entities?

Yes No

If No, explain how this was ascertained. If Yes, provide a list of such instances and evidence of compliance. [Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

A list of outages affecting other entities as described in Requirement R9.

Documentary evidence (such as outlined in Measure M9) that demonstrates that the entity notified its Reliability Coordinator and impacted interconnected entities of planned outages of telemetering and control equipment, telecommunication equipment, monitoring and assessment capabilities, and associated communication channels.

Registered Entity Evidence (Required):

DRAFT NERC Reliability Standard Audit Worksheet

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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

Compliance Assessment Approach Specific to TOP-001-4, R9

This section to be completed by the Compliance Enforcement Authority

	(R9) For all, or a sample of, outages selected by the auditor from a list provided by the entity, review evidence and verify the entity notified its Reliability Coordinator and impacted interconnected entities of outages as described in Requirement R9.
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R10 Supporting Evidence and Documentation

- R10.** Each Transmission Operator shall perform the following for determining System Operating Limit (SOL) exceedances within its Transmission Operator Area:
- 10.1.** Monitor Facilities within its Transmission Operator Area;
 - 10.2.** Monitor the status of Remedial Action Schemes within its Transmission Operator Area;
 - 10.3.** Monitor non-BES facilities within its Transmission Operator Area identified as necessary by the Transmission Operator;
 - 10.4.** Obtain and utilize status, voltages, and flow data for Facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator;
 - 10.5.** Obtain and utilize the status of Remedial Action Schemes outside its Transmission Operator Area identified as necessary by the Transmission Operator; and
 - 10.6.** Obtain and utilize status, voltages, and flow data for non-BES facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator.
- M10.** Each Transmission Operator shall have, and provide upon request, evidence that could include but is not limited to Energy Management System description documents, computer printouts, Supervisory Control and Data Acquisition (SCADA) data collection, or other equivalent evidence that will be used to confirm that it monitored or obtained and utilized data as required to determine any System Operating Limit (SOL) exceedances within its Transmission Operator Area.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Energy Management System (EMS) description documents, computer printouts, summary of SCADA collections of Real-time monitoring telemetry, or other equivalent evidence that will be used to confirm that the entity, for the purpose of determining System Operating Limit (SOL) exceedances, has monitored Facilities, status of Remedial Action Schemes, and non-BES facilities identified as necessary within its Transmission Operator Area, and obtained and utilized status, voltages, and flow data for Facilities and non-BES facilities, and status of Remedial Action Schemes, outside its Transmission Operator Area. .

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

DRAFT NERC Reliability Standard Audit Worksheet

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R10

This section to be completed by the Compliance Enforcement Authority

	<p>(R10) For all of the following, or a sample thereof, review evidence and determine if the entity monitored, or obtained and utilized data, to determine any System Operating Limit exceedances within its Transmission Operator Area, as specified in Requirement R10:</p> <ul style="list-style-type: none"> • Facilities within its Transmission Operator Area; • Status of Remedial Action Schemes within its Transmission Operator Area; • Non-BES facilities within its Transmission Operator Area identified as necessary by the Transmission Operator; • Status, voltages, and flow data for Facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator; • Status of Remedial Action Schemes outside its Transmission Operator Area identified as necessary by the Transmission Operator; and • Status, voltages, and flow data for non-BES facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator.
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Note to Auditor:

The intent of the requirement is to ensure that all facilities (i.e., BES and non-BES) that can adversely impact reliability are monitored. As used in TOP and IRO Reliability Standards, monitoring involves observing operating status and operating values in Real-time for awareness of system conditions. The facilities that are necessary for determining SOL exceedances should be either designated as part of the BES, or otherwise be incorporated into monitoring when identified by planning and operating studies such as the Operational Planning Analysis (OPA) required by TOP-002-4 Requirement R1 and IRO-008-2 Requirement R1. The SDT recognizes that not all non-BES facilities that a TOP considers necessary for its monitoring needs will need to be included in the BES.

The non-BES facilities that the TOP is required to monitor are only those that are necessary for the TOP to determine SOL exceedances within its Transmission Operator Area. TOPs perform various analyses and

DRAFT NERC Reliability Standard Audit Worksheet

studies as part of their functional obligations that could lead to identification of non-BES facilities that should be monitored for determining SOL exceedances. Examples include:

- OPA;
- Real-time Assessments (RTA);
- Analysis performed by the TOP as part of BES Exception processing for including a facility in the BES; and
- Analysis which may be specified in the RC's outage coordination process that leads to the identification of a non-BES facility that should be temporarily monitored for determining SOL exceedances.

TOP-003-3 Requirement R1 specifies that the TOP shall develop a data specification which includes data and information needed by the TOP to support its OPAs, Real-time monitoring, and RTAs. This includes non-BES data and external network data as deemed necessary by the TOP.

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R11 Supporting Evidence and Documentation

R11. Each Balancing Authority shall monitor its Balancing Authority Area, including the status of Remedial Action Schemes that impact generation or Load, in order to maintain Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.

M11. Each Balancing Authority shall have, and provide upon request, evidence that could include but is not limited to Energy Management System description documents, computer printouts, SCADA data collection, or other equivalent evidence that will be used to confirm that it monitors its Balancing Authority Area, including the status of Remedial Action Schemes that impact generation or Load, in order to maintain Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (such as outlined in Measure M11) that demonstrates that the entity monitors its Balancing Authority Area.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R11

This section to be completed by the Compliance Enforcement Authority

DRAFT NERC Reliability Standard Audit Worksheet

	(R11) Review the documentation provided to verify that the entity's Balancing Authority Area was monitored as specified in Requirement R11.
Note to Auditor:	

Auditor Notes:

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DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R12 Supporting Evidence and Documentation

R12. Each Transmission Operator shall not operate outside any identified Interconnection Reliability Operating Limit (IROL) for a continuous duration exceeding its associated IROL T_v .

M12. Each Transmission Operator shall make available evidence to show that for any occasion in which it operated outside any identified Interconnection Reliability Operating Limit (IROL), the continuous duration did not exceed its associated IROL T_v . Such evidence could include but is not limited to dated computer logs or reports in electronic or hard copy format specifying the date, time, duration, and details of the excursion. If such a situation has not occurred, the Transmission Operator may provide an attestation that an event has not occurred.

Registered Entity Response (Required):

Question: Did the entity exceed an identified IROL for any period of time during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of such instances and include evidence the system was returned to within the IROL within the IROL T_v .

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (such as outlined in Measure M12) that demonstrates that the entity did not operate outside any identified IROL for a continuous duration exceeding its associated IROL T_v .

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

DRAFT NERC Reliability Standard Audit Worksheet

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

Compliance Assessment Approach Specific to TOP-001-4, R12

This section to be completed by the Compliance Enforcement Authority

	(R12) For a sample of BES events selected by the auditor, review evidence and verify the entity did not operate outside any IROL for a continuous duration exceeding its associated IROL T _v .
Note to Auditor: Auditors are advised to monitor compliance with Requirement R12 during events, due to the importance of compliance with Requirement R12 in such instances. Auditors can obtain a population of events for sampling from NERC's, or the Regional Entity's records of mandatory event reports, other information available at the Regional Entities, or a query of the entity. Auditors should monitor compliance specifically for category 2.g events since these are specifically exceedances of IROLs for time T _v .	

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R13 Supporting Evidence and Documentation

R13. Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes.

M13. Each Transmission Operator shall have, and make available upon request, evidence to show it ensured that a Real-Time Assessment was performed at least once every 30 minutes. This evidence could include but is not limited to dated computer logs showing times the assessment was conducted, dated checklists, or other evidence.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (as outlined in Measure M13) that demonstrates that the entity ensured a Real-time Assessment was performed at least once every 30 minutes.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R13

This section to be completed by the Compliance Enforcement Authority

	(R13) Review documentary evidence that demonstrates that the Transmission Operator ensured a Real-time Assessment was performed at least once every 30 minutes.
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Note to Auditor: Auditors are advised to monitor compliance with Requirement R13 during events, due to the importance of Real-time Assessments in such instances. Auditors can obtain a population of events for

DRAFT NERC Reliability Standard Audit Worksheet

sampling from NERC's, or the Reliability Entity's, records of mandatory event reports, other information available at the Regional Entities, or a query of the entity. Auditors are encouraged to monitor compliance during the most critical events on the entity's system occurring during the compliance monitoring period.

Auditor Notes:

DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R14 Supporting Evidence and Documentation

- R14.** Each Transmission Operator shall initiate its Operating Plan to mitigate a SOL exceedance identified as part of its Real-time monitoring or Real-time Assessment.
- M14.** Each Transmission Operator shall have evidence that it initiated its Operating Plan for mitigating SOL exceedances identified as part of its Real-time monitoring or Real-time Assessments. This evidence could include but is not limited to dated computer logs showing times the Operating Plan was initiated, dated checklists, or other evidence.

Registered Entity Response (Required):

Question: Did the entity have any SOL exceedances during the compliance monitoring period?

Yes No

If Yes, provide a list of such exceedances. If No, describe how this was ascertained.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
 Documentary evidence (as outlined in Measure M14) that demonstrates that the entity initiated its Operating Plan to mitigate an SOL exceedance identified as part of its Real-time monitoring or Real-time Assessment.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

DRAFT NERC Reliability Standard Audit Worksheet

Compliance Assessment Approach Specific to TOP-001-4, R14

This section to be completed by the Compliance Enforcement Authority

	(R14) For all, or a sample of, SOL exceedances, review documentary evidence that demonstrates that the entity initiated its Operating Plan to mitigate an SOL exceedance identified as part of its Real-time monitoring or Real-time Assessment.
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Note to Auditor:

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R15 Supporting Evidence and Documentation

R15. Each Transmission Operator shall inform its Reliability Coordinator of actions taken to return the System to within limits when a SOL has been exceeded.

M15. Each Transmission Operator shall make available evidence that it informed its Reliability Coordinator of actions taken to return the System to within limits when a SOL was exceeded. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, or dated computer printouts. If such a situation has not occurred, the Transmission Operator may provide an attestation.

Registered Entity Response (Required):

Question: Did the entity have any SOL exceedances during the compliance monitoring period?

Yes No

If No, describe how this was ascertained. If Yes, provide a list of such exceedances and evidence of having informed the Reliability Coordinator of actions to return the system to within limits.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (such as outlined in Measure M15) that demonstrates that the entity informed its Reliability Coordinator of its actions to return the system to within limits when a SOL has been exceeded.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

DRAFT NERC Reliability Standard Audit Worksheet

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

Compliance Assessment Approach Specific to TOP-001-4, R15

This section to be completed by the Compliance Enforcement Authority

	(R15) For all, or a sample of, SOL exceedances, review documentary evidence that demonstrates the entity informed its RC of its actions to return the system to within limits when an SOL had been exceeded.
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	Note to Auditor: Note the entity’s response to applicability Question for Requirement R14 of this document, when selecting a sample for audit testing.
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Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R16 Supporting Evidence and Documentation

R16. Each Transmission Operator shall provide its System Operators with the authority to approve planned outages and maintenance of its telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels between affected entities.

M16. Each Transmission Operator shall have, and provide upon request, evidence that could include but is not limited to a documented procedure or equivalent evidence that will be used to confirm that the Transmission Operator has provided its System Operators with the authority to approve planned outages and maintenance of telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels between affected entities.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
Documentary evidence (as outlined in Measure M16) that demonstrates that the entity provided its System Operators with the authority to approve planned outages of its monitoring, telecommunication, and analysis capabilities.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R16

This section to be completed by the Compliance Enforcement Authority

	(R16) Review documentary evidence, such as job descriptions or desk procedure(s), that demonstrates
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DRAFT NERC Reliability Standard Audit Worksheet

	the entity provided its System Operators with the authority to approve planned outages of its telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.
	(R16) Interview entity representatives to determine if they provided their System Operators with the authority to approve planned outages of its own telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.
Note to Auditor: This authority can also be confirmed during System Operator interview questions.	

Auditor Notes:

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DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R17 Supporting Evidence and Documentation

R17. Each Balancing Authority shall provide its System Operators with the authority to approve planned outages and maintenance of its telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.

M17. Each Balancing Authority shall have, and provide upon request, evidence that could include but is not limited to a documented procedure or equivalent evidence that will be used to confirm that the Balancing Authority has provided its System Operators with the authority to approve planned outages and maintenance of its telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
Documentary evidence (such as outlined in Measure M17) that demonstrates that the entity provided its System Operators with the authority to approve planned outages of its own monitoring and analysis capabilities.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R17

This section to be completed by the Compliance Enforcement Authority

	(R17) Review documentary evidence, such as job descriptions or desk procedure(s), that demonstrates that
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DRAFT NERC Reliability Standard Audit Worksheet

	the entity provided its System Operators with the authority to approve planned outages of its telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.
	(R17) Interview entity representatives to determine if they provided their System Operators with the authority to approve planned outages of telemetering and control equipment, monitoring and assessment capabilities and associated communication channels between affected entities.
Note to Auditor: This authority can also be confirmed during System Operator interviews.	

Auditor Notes:

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DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R18 Supporting Evidence and Documentation

- R18.** Each Transmission Operator shall operate to the most limiting parameter in instances where there is a difference in SOLs.
- M18.** Each Transmission Operator shall have, and provide upon request, evidence that could include but is not limited to operator logs, voice recordings, electronic communications, or equivalent evidence that will be used to determine if it operated to the most limiting parameter in instances where there is a difference in SOLs.

Registered Entity Response (Required):

Question: Did the entity experience an instance where there was a difference in SOLs during the compliance monitoring period?

Yes No

If No, state how this was ascertained. If yes, provide a list of such instances and include evidence the system was operated to the most limiting parameter.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Documentary evidence (such as outlined in Measure M18) that demonstrates that the entity always operated to the most limiting parameter in instances where there was a difference in SOLs.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

DRAFT NERC Reliability Standard Audit Worksheet

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

Compliance Assessment Approach Specific to TOP-001-4, R18

This section to be completed by the Compliance Enforcement Authority

	(R18) For all, or a sample of, BES events selected by the auditor, review evidence and verify the entity operated to the most limiting parameter in instances where there was a difference in SOLs.
Note to Auditor: Auditors are advised to monitor compliance with Requirement R18 during events, due to the importance of compliance with Requirement R18 in such instances. Auditors can obtain a population of events for sampling from NERC's, or Regional Entity's, records of mandatory event reports, other information available at the Regional Entities, or a query of the entity. Auditors are encouraged to monitor compliance during the most critical events on the entity's system occurring during the compliance monitoring period. In the absence of events where differences in SOL exist, auditors should understand the entity's process for complying with Requirement R18 and walkthrough examples of instances where the entity would need to operate to the most limiting parameter when there were differences in SOLs.	

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R19 Supporting Evidence and Documentation

- R19.** Each Transmission Operator shall have data exchange capabilities with the entities it has identified it needs data from in order to perform its Operational Planning Analyses.
- M19.** Each Transmission Operator shall have, and provide upon request, evidence that could include, but is not limited to, operator logs, system specifications, system diagrams, or other evidence that it has data exchange capabilities with the entities it has identified it needs data from in order to perform its Operational Planning Analyses.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
List of other entities that the audited entity has identified that it needs data from in order to perform its Operational Planning Analyses.
Operator logs, system specification, or other evidence that the entity has data exchange capabilities with the entities that it has identified that it needs data from.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R19

This section to be completed by the Compliance Enforcement Authority

	(R19) For all, or a sample of, entities that the audited entity has identified that it needs data from in order to perform its Operational Planning Analyses, review evidence to verify the entity has data
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DRAFT NERC Reliability Standard Audit Worksheet

exchange capabilities with those identified entities.

Note to Auditor: TOP-003-3 requires the TOP and BA to have a data specification for all the data it needs for operational planning analysis, real-time assessment, and real-time monitoring.

Auditor Notes:

DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R20 Supporting Evidence and Documentation

- R20.** Each Transmission Operator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Transmission Operator's primary Control Center, for the exchange of Real-time data with its Reliability Coordinator, Balancing Authority, and the entities it has identified it needs data from in order for it to perform its Real-time monitoring and Real-time Assessments.
- M20.** Each Transmission Operator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Transmission Operator's primary Control Center, for the exchange of Real-time data with its Reliability Coordinator, Balancing Authority, and the entities it has identified it needs data from in order to perform its Real-time monitoring and Real-time Assessments as specified in the requirement.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
Provide a list(s) of data exchange capabilities with its Reliability Coordinator, Balancing Authority, and the entities it has identified it needs data from in order for it to perform its Real-time monitoring and Real-time Assessments.
Evidence that data exchange capabilities include redundant and diversely routed data exchange infrastructure within the entity's primary Control Center.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.					
File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

DRAFT NERC Reliability Standard Audit Worksheet

Compliance Assessment Approach Specific to TOP-001-4, R20

This section to be completed by the Compliance Enforcement Authority

	(R20) Review a list of entities that includes the Reliability Coordinator, Balancing Authority, and entities that the Transmission Operator has identified it needs data from in order for it to perform its Real-time monitoring and Real-time Assessments, and ensure data exchange capabilities exists as required in Requirement R20.
	(R20) Verify that data exchange capabilities have redundant and diversely routed data exchange infrastructure within the Transmission Operator's primary Control Center.

Note to Auditor:

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g. switches, routers, file servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure or malfunction of an individual component within the Transmission Operator's (TOP) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R20 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the TOP's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. Additional redundant data exchange infrastructure components solely to provide for redundancy during planned or unplanned outages of individual components is not required.

Infrastructure that is not within the TOP's primary Control Center is not addressed by the proposed requirement.

TOP-003-3 requires the TOP and BA to have a data specification for all the data it needs for operational planning analysis, real-time assessment, and real-time monitoring.

Auditor Notes:

DRAFT NERC Reliability Standard Audit Worksheet

R21 Supporting Evidence and Documentation

- R21.** Each Transmission Operator shall test its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Transmission Operator shall initiate action within two hours to restore redundant functionality.
- M21.** Each Transmission Operator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and, if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R21. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

Registered Entity Response (Required):

Question: Were any of the data exchange capability tests unsuccessful?

Yes No

If No, explain how this was ascertained. If Yes, provide a list of such instances and evidence of compliance.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
Provide a list(s) of data exchange capabilities specified in Requirement R20.
Evidence that the entity tested its data exchange capabilities specified in Requirement R20 for redundant functionality, or experienced an event that demonstrated the redundant functionality.
Evidence that for each unsuccessful test, the entity initiated action within two hours to restore redundant functionality.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

DRAFT NERC Reliability Standard Audit Worksheet

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R21

This section to be completed by the Compliance Enforcement Authority

	(R21) Verify the entity tests its data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days.
	Verify that for each unsuccessful test, the entity initiated action, which could include but is not limited to contacting support staff, implementing a procedure used to assist in the restoration of redundant functionality, etc., within two hours to restore redundant functionality.

Note to auditor:

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component. An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Auditor Notes:

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DRAFT NERC Reliability Standard Audit Worksheet

R22 Supporting Evidence and Documentation

- R22.** Each Balancing Authority shall have data exchange capabilities with the entities it has identified it needs data from in order to develop its Operating Plan for next-day operations.
- M22.** Each Balancing Authority shall have, and provide upon request, evidence that could include, but is not limited to, operator logs, system specifications, system diagrams, or other evidence that it has data exchange capabilities with the entities it has identified it needs data from in order to develop its Operating Plan for next-day operations.

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.
List of other entities that the entity has identified that it needs data from in order to develop its Operating Plan for next-day operations.
Operator logs, system specification, system diagrams, or other evidence that the entity has data exchange capabilities with the entities that it has identified that it needs data from.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R22

This section to be completed by the Compliance Enforcement Authority

(R22) For all, or a sample of, entities that the audited entity has identified that it needs data from in order

DRAFT NERC Reliability Standard Audit Worksheet

to develop its Operating Plan for next-day operations, review evidence to verify the entity has data exchange capabilities with those identified entities.

Note to Auditor: TOP-003-3 requires the TOP and BA to have a data specification for all the data it needs for operational planning analysis, real-time assessment, and real-time monitoring.

Auditor Notes:

DRAFT

DRAFT NERC Reliability Standard Audit Worksheet

R23 Supporting Evidence and Documentation

- R23.** Each Balancing Authority shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Balancing Authority's primary Control Center, for the exchange of Real-time data with its Reliability Coordinator, Transmission Operator, and the entities it has identified it needs data from in order for it to perform its Real-time monitoring and analysis functions.
- M23.** Each Balancing Authority shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Balancing Authority's primary Control Center, for the exchange of Real-time data with its Reliability Coordinator, Transmission Operator, and the entities it has identified it needs data from in order to perform its Real-time monitoring and analysis functions as specified in the requirement.

Compliance Narrative (Required):

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

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Evidence Requested³:

Provide the following evidence, or other evidence to demonstrate compliance.
Provide a list(s) of data exchange capabilities with its Reliability Coordinator, Transmission Operator, and the entities it has identified it needs data from in order for it to perform its Real-time monitoring and analysis functions.
Evidence that data exchange capabilities have redundant and diversely routed data exchange infrastructure within the entity's primary Control Center.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.					
File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

DRAFT NERC Reliability Standard Audit Worksheet

Compliance Assessment Approach Specific to TOP-001-4, R23

This section to be completed by the Compliance Enforcement Authority

	(R23) For all, or a sample of, entities that the audited entity has identified that it needs Real-time data from in order to perform its Real-time monitoring and analysis functions, review evidence to verify the entity has data exchange capabilities with those identified entities.
	(R23) Verify that data exchange capabilities have redundant and diversely routed data exchange infrastructure within the entity's primary Control Center

Note to Auditor:

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g. switches, routers, file servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure or malfunction of an individual component within the Balancing Authority's (BA) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R23 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the BA's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. Additional redundant data exchange infrastructure components solely to provide for redundancy during planned or unplanned outages of individual components is not required.

Infrastructure that is not within the BA's primary Control Center is not addressed by the proposed requirement.

TOP-003-3 requires the TOP and BA to have a data specification for all the data it needs for operational planning analysis, real-time assessment, and real-time monitoring.

Auditor Notes:

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R24 Supporting Evidence and Documentation

- R24.** Each Balancing Authority shall test its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Balancing Authority shall initiate action within two hours to restore redundant functionality.
- M24.** Each Balancing Authority shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and, if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R24. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

Registered Entity Response (Required):

Question: Were any of the data exchange capability tests unsuccessful?

Yes No

If No, explain how this was ascertained. If Yes, provide a list of such instances and evidence of compliance.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Compliance Narrative (Required):

Provide a brief explanation, in your own words, of how you comply 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.

Provide a list(s) of data exchange capabilities specified in Requirement R23.

Evidence that the entity tested its data exchange capabilities specified in Requirement R23 for redundant functionality, or experienced an event that demonstrated the redundant functionality.

Evidence that for each unsuccessful test, the entity initiated action within two hours to restore redundant functionality.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

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

Compliance Assessment Approach Specific to TOP-001-4, R24

This section to be completed by the Compliance Enforcement Authority

	(R24) Verify the entity tests its data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days.
	Verify that for each unsuccessful test, the entity initiated action, which could include but is not limited to contacting support staff, implementing a procedure used to assist in the restoration of redundant functionality, etc., within two hours to restore redundant functionality.

Note to auditor:

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component. An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Auditor Notes:

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Additional Information:

Reliability Standard

To be inserted by RSAW developer prior to posting of this RSAW associated with the enforceable date of this Reliability Standard.

Sampling Methodology

To be inserted by RSAW developer prior to posting of this RSAW associated with the enforceable date of this Reliability Standard, if applicable.

Regulatory Language

To be inserted by NERC Legal prior to posting of this RSAW associated with the enforceable date of this Reliability Standard.

Selected Glossary Terms

To be inserted by RSAW developer prior to posting of this RSAW associated with the enforceable date of this Reliability Standard, if applicable.

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Revision History for RSAW

Version	Date	Reviewers	Revision Description
1	06/30/2016	NERC Compliance Assurance, RSAW Task Force	New Document
2	09/09/2016	NERC Compliance Assurance, RSAW Task Force	Updated to reflect changes in draft Standard

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