Standard MOD-026-1 — Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions

**标准MOD-026-1-**

验证发电机励磁控制系统或发电厂电压/ 无功控制功能的模型和数据

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Introduction

A、 简介

1. Title: Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions

1标题：验证发电机励磁控制系统或发电厂电压/ 无功控制功能的模型和数据

2. Number: MOD-026-1

2编号：MOD-026-1

3. Purpose: To verify that the generator excitation control system or plant volt/var control function1 model (including the power system stabilizer model and the impedance compensator model) and the model parameters used in dynamic simulations accurately represent the generator excitation control system or plant volt/var control function behavior when assessing Bulk Electric System (BES) reliability.

3. 目的：为了验证发电机励磁控制系统或电厂电压/无功控制功能1模型（包括电力系统稳定器模型和阻抗补偿器模型）和动态仿真中使用的模型参数，在评估大容量电力系统( BES )可靠性时，能够准确地表征发电机励磁控制系统或厂用电压/无功控制功能行为。

4. Applicability:

4适用性：

4.1. Functional Entities:

4.1. 功能主体：

4.1.1 Generator Owner

4.1.1发电机拥有者

4.1.2 Transmission Planner

4.1.2传输规划输电规划人员

4.2. Facilities:

4.2. 设施：

For the purpose of the requirements contained herein, Facilities that are directly connected to the Bulk Electric System (BES) will be collectively referred as an “applicable unit” that meet the following:

就本文所含要求而言，与大电网（BES）直接相连的设施将统称为满足以下条件的“适用机组”：

4.2.1 Generation in the Eastern or Quebec Interconnections with the following

characteristics:

4.2.1东部或魁北克省的发电互联系统具有以下特点：

4.2.1.1 Individual generating unit greater than 100 MVA (gross nameplate rating).

4.2.1.1单个发电机组大于100 MVA（铭牌总额定值）。

4.2.1.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 100 MVA (gross aggregate nameplate rating).

4.2.1.2由多个发电机组组成独立发电厂。这些机组直接连接在公共BES母线上，总发电量大于100 MVA（铭牌额定总发电量）。

4.2.2 Generation in the Western Interconnection with the following

characteristics:

4.2.2西部互联发电具有以下特点：

4.2.2.1 Individual generating unit greater than 75 MVA (gross nameplate rating).

4.2.2.1单个发电机组大于75 MVA（铭牌总额定值）。

4.2.2.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 75 MVA (gross aggregate nameplate rating).

4.2.2.2由多台发电机组组成独立发电厂。这些机组直接连接在公共BES母线上，总发电量大于75 MVA（铭牌额定总发电量）。

1 Excitation control system or plant volt/var control function:

1励磁控制系统或电厂电压/无功控制功能：

a. For individual synchronous machines, the generator excitation control system includes the generator, exciter, voltage regulator, impedance compensation and power system stabilizer.

a、 对于单个同步电机，发电机励磁控制系统包括发电机、励磁机、电压调节器、阻抗补偿和电力系统稳定器。

b. For an aggregate generating plant, the volt/var control system includes the voltage regulator & reactive power control system controlling and coordinating plant voltage and associated reactive capable resources.

b、 对于综合发电厂，电压/无功控制系统包括电压调节器和无功功率控制系统，用于控制和协调电厂电压和相关无功资源。

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4.2.3 Generation in the ERCOT Interconnection with the following

characteristics:

4.2.3 ERCOT互联中的发电具有以下特点：

4.2.3.1 Individual generating unit greater than 50 MVA (gross nameplate rating).

4.2.3.1单个发电机组大于50MVA（铭牌总额定值）。

4.2.3.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 75 MVA (gross aggregate nameplate rating).

4.2.3.2由多个发电机组组成独立发电厂。这些机组直接连接在公共BES母线上，总发电量大于75 MVA（铭牌额定总发电量）。

4.2.4 For all Interconnections:

4.2.4对于所有互连：

A technically justified2 unit that meets NERC registry criteria but is not otherwise included in the above Applicability sections 4.2.1, 4.2.2, or 4.2.3 and is requested by the Transmission Planner.

符合NERC注册标准的技术上合理的机组，，但不包括在上述适用范围第4.2.1、4.2.2或4.2.3节中，并由输电规划人员要求。

5. Effective Date:

5生效日期：

5.1. For Requirements R1, and R3 through R6, the first day of the first calendar quarter beyond the date that this standard is approved by applicable regulatory authorities or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities. In those jurisdictions where regulatory approval is not required, the standard shall become effective on the first day of the first calendar quarter beyond the date this standard is approved by the NERC Board of Trustees, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

5.1. 对于要求R1和R3至R6，本标准经相关监管机构批准或根据适用于此类ERO政府机构的法律生效之日后第一个日历季度的第一天。在不需要监管部门批准的司法管辖区中，本标准应在NERC董事会批准本标准之日后的第一个日历季度的第一天生效，或根据适用于此类ERO政府机构的法律生效。

5.2. For Requirement R2, 30 percent of the entity’s applicable unit gross MVA for each Interconnection on the first day of the first calendar quarter that is four years following applicable regulatory approval or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities, or in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter that is four years following NERC Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

5.2. 对于要求R2，在第一个日历季度的第一天，即适用监管机构批准后四年或根据适用于此类政府机构的法律生效后，每个互连的实体适用的机组总MVA的30%，或在无需监管批准的司法管辖区，在第一个日历季度的第一天，即NERC董事会通过后四年，或根据适用于此类政府机构的法律生效。

5.3. For Requirement R2, 50 percent of the entity’s applicable unit gross MVA for each Interconnection on first day of the first calendar quarter that is six years following applicable regulatory approval or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities, or in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter that is six years following NERC Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

5.3. 对于要求R2，在第一个日历季度的第一天，即适用监管机构批准后的六年内，或根据适用于该ERO政府当局的法律或在没有监管机构的司法管辖区生效的其他法律，每个互连的实体适用的机组总MVA的50%，或那些不需要监管机构批准的司法管辖区，在第一个日历季度的第一天（即NERC董事会通过后六年）或根据适用于此类ERO政府机构的法律以其他方式生效的。

5.4. For Requirement R2, 100 percent of the entity’s applicable unit gross MVA for each Interconnection on the first day of the first calendar quarter that is 10 years

5.4. 对于要求R2，在第一个日历季度（即10年）的第一天，实体适用的单位总MVA的100%

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Technical justification is achieved by the Transmission Planner demonstrating that the simulated unit or plant response does not match the measured unit or plant response.

输电规划人员通过证明模拟机组或电厂响应与测量机组或电厂响应不匹配来实现技术论证。

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following applicable regulatory approval or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities, or in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter that is 10 years following NERC Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

在获得适用的监管批准后，或根据适用于此类ERO政府机构的法律生效，或在不需要监管批准的司法管辖区内，在第一个日历季度的第一天，即NERC董事会通过后10年，或根据适用于此类政府机构的法律以其他方式生效。

1. Requirements

B、 规范

R1. Each Transmission Planner shall provide the following requested information to the Generator Owner within 90 calendar days of receiving a written request : [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

R1.各输电规划人员应在收到书面请求后90个日历日内, 向发电机运营商商提供以下要求的信息：[违规风险系数：较低][时间范围：运行计划]

 Instructions on how to obtain the list of excitation control system or plant volt/var control function models that are acceptable to the Transmission Planner for use in dynamic simulation,

关于如何获得输电规划人员可接受的用于动态仿真的励磁控制系统或电厂电压/无功控制功能模型列表的说明，

 Instructions on how to obtain the dynamic excitation control system or plant volt/var control function model library block diagrams and/or data sheets for models that are acceptable to the Transmission Planner, or

关于如何获得动态励磁控制系统或设备的说明电压/无功控制功能模型库框图和/或数据表传输规划器可接受的模型，或

 Model data for any of the Generator Owner’s existing applicable unit specific excitation control system or plant volt/var control function contained in the Transmission Planner’s dynamic database from the current (in-use) models, including generator MVA base.

输电规划人员的动态数据库来自当前（使用中）模型，包括发电机MVA基础信息，其中包含任何发电机运行商现有适用机组特定励磁控制系统或电厂电压/无功控制功能的模型数据。

R2. Each Generator Owner shall provide for each applicable unit, a verified generator excitation control system or plant volt/var control function model, including documentation and data (as specified in Part 2.1) to its Transmission Planner in accordance with the periodicity specified in MOD-026 Attachment 1. [Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]

R2.各发电机运营商运营商应按照MOD-026附件1中规定的周期，为各适用机组提供经验证的发电机励磁控制系统或电厂电压/无功控制功能模型，包括文件和数据（如第2.1部分所规定）。【违规风险因素：中】【时间范围：长期规划】

2.1. Each applicable unit’s model shall be verified by the Generator Owner using one or more models acceptable to the Transmission Planner. Verification for individual units less than 20 MVA (gross nameplate rating) in a generating plant (per Section 4.2.1.2, 4.2.2.2, or 4.2.3.2) may be performed using either individual unit or aggregate unit model(s), or both. Each verification shall include the following:

2.1. 发电机运行商应使用输电规划人员可接受的一个或多个模型验证每个适用机组的模型。在发电厂（根据第4.2.1.2节、第4.2.2.2节或第4.2.3.2节）中，小于20 MVA（铭牌总额定值）的单个机组的验证，可使用单个机组或聚合机组模型进行，或同时使用两者进行。每次验证应包括以下内容：

2.1.1. Documentation demonstrating the applicable unit’s model response matches the recorded response for a voltage excursion from either a staged test or a measured system disturbance,

2.1.1. 证明适用机组的模型响应与记录的电压偏移响应相匹配的文件测试或测量系统干扰，

2.1.2. Manufacturer, model number (if available), and type of the excitation control system including, but not limited to static, AC brushless, DC rotating, and/or the plant volt/var control function (if installed),

2.1.2. 制造商，型号（如果有），励磁控制系统的类型包括但不限于静态、交流无刷、直流旋转和/或电厂电压/无功控制功能（如已安装），

2.1.3. Model structure and data including, but not limited to reactance, time

constants, saturation factors, total rotational inertia, or equivalent data for

the generator,

2.1.3. 模型结构和数据，包括但不限于电抗、时间常数、饱和系数、总转动惯量或发电机的等效数据，

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2.1.4. Model structure and data for the excitation control system, including the closed loop voltage regulator if a closed loop voltage regulator is installed or the model structure and data for the plant volt/var control function system,

2.1.4. 励磁控制系统的模型结构和数据，包括闭环电压调节器（如果安装了闭环电压调节器）或电厂电压/无功控制功能系统的模型结构和数据，

2.1.5. Compensation settings (such as droop, line drop, differential compensation), if used, and

2.1.5. 补偿设置（如下垂、线路压降、微分补偿），如果使用，以及

2.1.6. Model structure and data for power system stabilizer, if so equipped.

2.1.6. 电力系统稳定器的模型结构和数据（如有配备）。

R3. Each Generator Owner shall provide a written response to its Transmission Planner within 90 calendar days of receiving one of the following items for an applicable unit:

R3。各发电机运营商应在收到适用机组的下列项目之一后90个日历日内，向其输电规划人员提供书面回复：

 Written notification from its Transmission Planner (in accordance with Requirement R6) that the excitation control system or plant volt/var control function model is not usable, 

输电规划人员（根据要求R6）发出书面通知，说明励磁控制系统或电厂电压/无功控制模型不可用

Written comments from its Transmission Planner identifying technical concerns with the verification documentation related to the excitation control system or plant volt/var control function model, or

输电规划师的书面意见，确定与励磁控制系统或电厂电压/无功控制功能模型相关的验证文件的技术问题，或

 Written comments and supporting evidence from its Transmission Planner indicating that the simulated excitation control system or plant volt/var control function model response did not match the recorded response to a transmission system event.

输电规划师的书面意见和支持证据表示模拟励磁控制系统或电厂电压/无功控制功能模型响应与记录的传输系统事件响应不匹配。

The written response shall contain either the technical basis for maintaining the current model, the model changes, or a plan to perform model verification3(in accordance with Requirement R2). [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

书面回复应包含维护当前模型的技术依据、模型变更或执行模型验证的计划3（根据要求R2）。【违规风险系数：较低】【时间范围：运营规划】

R4. Each Generator Owner shall provide revised model data or plans to perform model verification4(in accordance with Requirement R2) for an applicable unit to its Transmission Planner within 180 calendar days of making changes to the excitation control system or plant volt/var control function that alter the equipment response characteristic.5[Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

R4.每位发电机运行商应在更改励磁控制系统或工厂电压/无功控制功能后的180个日历日内，向其输电计划者提供修改后的适用机组模型数据或计划，以对其模型进行验证4（根据要求R2）。 数据或计划改变了设备响应的特性。5[违规风险因素：较低] [时间范围：运营计划]

3

If verification is performed, the 10-year period as outlined in MOD-026 Attachment 1 is reset.

如果进行验证，则重置MOD-026附件1中概述的10年期限。

4

Ibid

同上

5 Exciter, voltage regulator, plant volt/var or power system stabilizer control replacement including software alterations that alter excitation control system equipment response, plant digital control system addition or replacement, plant digital control system software alterations that alter excitation control system equipment response, plant volt/var function equipment addition or replacement (such as static var systems, capacitor banks, individual unit excitation systems, etc), a change in the voltage control mode (such as going from power factor control to automatic voltage control, etc), exciter, voltage regulator, impedance compensator, or power system stabilizer settings change. Automatic changes in settings that occur due to changes in operating mode do not apply to Requirement R4.

励磁机、电压调节器、电厂电压/无功或电力系统稳定器控制更换，包括改变励磁控制系统设备响应的软件变更、电厂数字控制系统添加或更换、改变励磁控制系统设备响应的电厂数字控制系统软件变更，电厂电压/无功功能设备的添加或更换（如静态无功系统、电容器组、单机励磁系统等）、电压控制模式的改变（如从功率因数控制到自动电压控制等）、励磁机、电压调节器、阻抗补偿器，或电力系统稳定器设置更改。由于操作系统的变化而自动改变设置模式不适用于要求R4。

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R5. Each Generator Owner shall provide a written response to its Transmission Planner,within 90 calendar days following receipt of a technically justified6 unit request from the Transmission Planner to perform a model review of a unit or plant that includes one of the following: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

R5。各发机运行商电商应在收到输电规划人员提出的技术上合理的机组要求后90个日历日内，向其输电规划师提供书面回复，以对机组或电厂进行模型审查，包括以下内容之一：[违规风险系数：较低][时间范围：运行规划]

 Details of plans to verify the model (in accordance with Requirement R2), or

验证模型的详细计划（根据要求R2），或

 Corrected model data including the source of revised model data such as discovery of manufacturer test values to replace generic model data or updating of data parameters based on an on-site review of the equipment.

修正模型数据，包括修正模型数据的来源，如发现制造商测试值以替换通用模型数据或根据设备的现场审查更新数据参数。

R6. Each Transmission Planner shall provide a written response to the Generator Owner within 90 calendar days of receiving the verified excitation control system or plant volt/var control function model information in accordance with Requirement R2 that the model is usable (meets the criteria specified in Parts 6.1 through 6.3) or is not usable.

R6。每个输电规划人员应在收到经验证的励磁控制系统或电厂电压/无功控制功能模型信息后的90个日历日内，根据R2要求，向发电机运营商提供一份书面回复，说明模型可用（符合第6.1至6.3部分规定的标准）或不可用。

6.1. The excitation control system or plant volt/var control function model initializes to compute modeling data without error,

6.1. 励磁控制系统或电厂电压/无功控制功能模型初始化，以无误差地计算建模数据，

6.2. A no-disturbance simulation results in negligible transients, and

6.2. 无干扰模拟可忽略瞬态，以及

6.3. For an otherwise stable simulation, a disturbance simulation results in the excitation control and plant volt/var control function model exhibiting positive damping.

6.3. 对于其他情况下稳定的仿真，扰动仿真会导致励磁控制和电厂电压/无功控制功能模型表现出正阻尼。

If the model is not usable, the Transmission Planner shall provide a technical

description of why the model is not usable. [Violation Risk Factor: Medium] [Time Horizon: Operations Planning]

如果模型不可用，输电规划人员应提供模型不可用原因的技术说明。【违规风险因素：中等】【时间范围：运营规划】

1. Measures

措施

M1. The Transmission Planner must have and provide the dated request for instructions or data, the transmitted instructions or data, and dated evidence of a written transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) as evidence that it provided the request within 90 calendar days in accordance with Requirement R1.

M1。传输规划人员必须拥有并提供注明日期的指令或数据请求、传输的指令或数据，以及注明日期的书面传输证据（如电子邮件、邮政收据或传真确认），作为其在90个日历日内按照要求R1提供请求的凭证。

M2. The Generator Owner must have and provide dated evidence it verified each generator excitation control system or plant volt/var control function model according to Part 2.1 for each applicable unit and a dated transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) as evidence it provided the model, documentation, and data to its Transmission Planner, in accordance with Requirement R2.

发电机运营商必须拥有并提供注明日期的凭证，证明其根据第2.1部分对每个适用机组的每个发电机励磁控制系统或电厂电压/无功控制功能模型进行了验证，并提供注明日期的传送单（如电子邮件、邮政收据或传真确认）作为其提供模型、文件的证据，并根据R2的要求将数据传输到其传输计划器。

M3. Evidence for Requirement R3 must include the Generator Owner’s dated written response containing the information identified in Requirement R3 and dated evidence of transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) of the response.要求R3的凭证必须包括发电机运营商注明日期的书面回复，其中包含要求R3中确定的信息和注明日期的传递凭证（例如，电子邮件、邮政收据或传真确认）回复。

6 Technical justification is achieved by the Transmission Planner demonstrating that the simulated unit or plant response does not match the measured unit or plant response.

6技术论证是由输电规划人员证明模拟机组或装置响应与测量的机组或电厂响应不匹配。

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M4. Evidence for Requirement R4 must include, for each of the Generator Owner’s applicable units for which system changes specified in Requirement R4 were made, a dated revised model data or plans to perform a model verification and dated evidence(e.g., electronic mail message, postal receipt, or confirmation of facsimile) it provided the revised model and data or plans within 180 calendar days of making changes.

M4。要求R4的证据必须包括，对于要求R4中规定的系统变更的每个发电机运营商的适用机组，进行模型验证的日期修订的模型数据或计划以及日期证据（例如，电子邮件、邮政收据、或传真确认）在作出更改后的180个日历日内提供修改后的模型和数据或计划。

M5. Evidence for Requirement R5 must include the Generator Owner’s dated written response containing the information identified in Requirement R5 and dated evidence (e.g., electronic mail message, postal receipt, or confirmation of facsimile) it provided a written response within 90 calendar days following receipt of a technically justified request.

M5。要求R5的证据必须包括发电机运营商注明日期的书面回复，其中包含要求R5中确定的信息，以及注明日期的证据（例如，电子邮件、邮寄收据或传真确认），其在收到技术上合理的请求后90个历日内提供了书面回复。

M6. Evidence of Requirement R6 must include, for each model received, the dated response indicating the model was usable or not usable according to the criteria specified in Parts 6.1 through 6.3 and for a model that is not usable, a technical description; and dated evidence of transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) that the Generator Owner was notified within 90 calendar days of receipt of model information.

M6。要求R6的证据必须包括，对于收到的每个模型，注明日期的响应，表明模型根据第6.1部分至第6.3部分规定的标准可用或不可用，对于不可用的模型，技术说明；以及注明日期的传输证据（例如，电子邮件、邮政收据、或传真确认）在收到型号信息后90个日历日内通知发电机运营商。

D. Compliance

D、 合规性

1. Compliance Monitoring Process

1合规监控流程

* 1. Compliance Enforcement Authority

1.1. 合规执法机关

The Regional Entity shall serve as the Compliance Enforcement Authority unless the applicable entity is owned, operated, or controlled by the Regional Entity. In such cases the ERO or a Regional entity approved by FERC or other applicable governmental authority shall serve as the CEA.

区域实体应作为合规执法机关，除非适用主体由区域实体拥有、经营或控制。在这种情况下，能源监管局或经联邦能源监管委员会或其他适用政府机构批准的区域主体应作为CEA。

* 1. Data Retention

1.2. 数据留存

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

以下证据留存期确定了主体需要保留特定证据以证明合规性的期限。例如如果下文规定的证据留存期短于自上次审计以来的时间，合规执行机构可要求主体提供其他证据，证明其在自上次审计以来的整个时间内是合规的。

The Generator Owner and Transmission Planner shall each keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation: 

发电机运营商和输电规划人员应各自保存数据或凭证，以证明符合以下规定，除非其合规执法机关指示将特定凭证保留较长时间作为调查的一部分：

The Transmission Planner shall retain the information/data request and provided response evidence of Requirements R1 and R6, Measures M1 and M6 for three calendar years from the date the document was provided.

输电规划人员应留存信息/数据请求并提供R1和R6要求、M1和M1措施的响应凭证自文件提供之日起三个日历年。

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 The Generator Owner shall retain the latest excitation control system or plant volt/var control function model verification evidence of Requirement R2, Measure M2.

发电机运营商应留存最新的励磁控制系统或电厂电压/无功控制功能模型验证凭证，证明要求R2，测量M2。

 The Generator Owner shall retain the information/data request and provided response evidence of Requirements R3 through R5, and Measures M3 through M5 for three calendar years from the date the document was provided.

发电机运营商应留存信息/数据请求和提供的R3至R5要求的响应凭证，并从文件提供之日起三个日历年内测量M3至M5。

If a Generator Owner or Transmission Planner is found non-compliant, it shall keep information related to the non-compliance until mitigation is complete or approved or for the time specified above, whichever is longer.

如果发现发电机运营商或输电规划人员不符合要求，则其应保留与不符合要求相关的信息，直到缓解措施完成或完成批准或在上述规定时间内，以较长者为准。

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

合规执行机构应保存上次审计记录以及所有要求和提交的后续审计记录。

* 1. Compliance Monitoring and Assessment Processes

1.3. 合规监测和评估流程

Compliance Audit

合规性审计

Self-Certification

自我认证

Spot Checking

抽查

Compliance Investigation

合规性调查

Self-Reporting

自我报告

Complaints

投诉

1.4. Additional Compliance Information

1.4. 其他合规信息

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1. **Violation Severity Levels**

违规严重程度

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R# | Lower VSL低 | Moderate VSL中 | High VSL高 | Severe VSL严重 |
| R1 | The Transmission Planner provided the instructions and data to the Generator Owner more than 90 calendar days but less than or equal to 120 calendar days of receiving a written request.  输电规划人员在收到书面请求后的90个日历日内（但不超过或等于120个日历日）向发电机运营商提供指示和数据。 | The Transmission Planner provided the instructions and data to the Generator Owner more than 120 calendar days but less than or equal to 150 calendar days of receiving a written request.  输电规划人员在收到书面请求后超过120个日历日但少于或等于150个日历日，向发电机运营商提供了说明和数据。 | The Transmission Planner provided the instructions and data to the Generator Owner more than 150 calendar days but less than or equal to 180 calendar days of receiving a written request.  输电规划人员在收到书面请求后超过150个日历日但少于或等于180个日历日内，向发电机运营商提供了说明和数据。 | The Transmission Planner failed to provide the instructions and data to the Generator Owner within 180 calendar days of receiving a written request.  输电规划人员未能在收到书面请求后180个日历日内向发电机运营商所有者提供说明和数据。 |
| R2 | The Generator Owner provided its verified model(s), including documentation and data to its Transmission Planner after the timeframe specified in MOD-026 Attachment 1 but less than or equal to 90 calendar days late;  发电机运营商在MOD-026附件1中规定的时间段后，向其输电规划人员提供了其验证模型，包括文件和数据，但迟交时间不超过90个日历日；  OR  The Generator Owner provided the Transmission Planner verified models that omitted one of the six Parts identified in Requirement R2, Parts 2.1.1 through 2.1.6.  发电机运营商向输电规划人员提供了验证模型，该模型省略了要求R2第2.1.1至2.1.6部分中确定的六个部分中的一个。 | The Generator Owner provided its verified model(s), including documentation and data to its Transmission Planner more than 90 calendar days but less than or equal to 180 calendar days late as specified by the periodicity timeframe in MOD-026 Attachment 1.  按照MOD-026附件1中规定的周期时间，发电机运营商向其输电规划人员提供了其验证模型，包括超过90个日历日但少于或等于180个日历日的文件和数据。  OR  The Generator Owner provided the Transmission Planner verified models that omitted two of the six Parts identified in Requirement R2, Parts 2.1.1 through 2.1.6.  发电机所有者向输电规划人员提供了验证模型，该模型省略了需求R2第2.1.1至2.1.6部分中确定的六个部分中的两个。 | The Generator Owner provided its verified model(s), including documentation and data to its Transmission Planner more than 180 calendar days but less than or equal to 270 calendar days late as specified by the periodicity timeframe in MOD-026 Attachment 1.  按照MOD-026附件1中规定的周期性时间框架，发电机运营商向其输电规划人员提供了超过180个日历日但少于或等于270个日历日的验证模型，包括文件和数据。  OR  The Generator Owner provided the Transmission Planner verified models that omitted three of the six Parts identified in Requirement R2, Parts 2.1.1 through 2.1.6.  发电机所有者向输电规划人员提供了验证模型，该模型省略了需求R2第2.1.1至2.1.6部分中确定的六个部分中的三个。 | The Generator Owner provided itsverified model(s), including documentation and data more than 270 calendar days late to its Transmission Planner in accordance with the periodicity specified in MOD-026 Attachment 1.  按照MOD-026号附件向其所有者提供的数据传输周期超过270天。  OR  The Generator Owner failed to use model(s) acceptable to the Transmission Planner as specified in Requirement R2, Part 2.1.  发电机运营商未能按照要求R2第2.1部分的规定使用输电规划人员可接受的型号。  OR  The Generator Owner provided the Transmission Planner verified model(s) but omitted four or more of the six parts identified in Requirement R2, Subparts 2.1.1 through 2.1.6.  发电机运营商向输电规划人员提供了验证模型，但遗漏了要求R2第2.1.1子部分至第2.1.6子部分中确定的六个部分中的四个或更多部分。 |

# Introduction A.介绍

## Title: Transmission Operations 标题： 输电运营

* 1. **Number:** TOP-001-4 **编号：**TOP-001-4
  2. **Purpose:** To prevent instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Interconnection by ensuring prompt action to prevent or mitigate such occurrences.

**目的:** 通过确保及时的操作以防止或减轻不稳定,不受控制的分离,或级联故障,严重影响互连的可靠性等此类事件。

## Applicability: 适用性：

* + 1. **Functional Entities: 4.1.功能性实体：**
       1. Balancing Authority **4.1.1.** 平衡机构
       2. Transmission Operator **4.1.2.** 输电运营商
       3. Generator Operator **4.1.3.** 发电机运营商
       4. Distribution Provider **4.1.4.** 配电供应商
  1. **Effective Date:** See Implementation Plan

**5. 生效日期：**见实施计划

# Requirements and Measures B.要求与措施

**R1.** Each Transmission Operator shall act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions. *[Violation Risk Factor: High][Time Horizon: Same-Day Operations, Real-time Operations]*

**R1.** 每个输电运营商应通过自己的行动或发布操作指令来维持其输电运营商区域的可靠性。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M1.** 每个输电运营商应提供证据可能包括但不限于过去时期的操作员日志,过去时期的记录,日期和带时间戳的声音录音或过去时期的记录的声音录音、电子通讯、或相关文档,这将被用来决定采取通过自己的行动或通过发行操作指令的行动来维护的可靠性输电运营商区域。

**R2.** Each Balancing Authority shall act to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions. *[Violation Risk Factor: High][Time Horizon: Same-Day Operations, Real-time Operations]*

**R2.** 每一个平衡机构应通过其自身的行动或发布操作指示来维持其平衡机构区域的可靠性。*(违反风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M2.** 每个平衡机构应拥有并提供证据，可能包括但不限于过去时期的操作员日志、日期记录、日期和时间戳的录音或日期的录音誊本、电子通信或同等文件，用于确定其通过自己的行动或发布操作指令来维持其平衡机构区域的可靠性。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R3.** 每个平衡机构、发电机运营商和配电供应商应遵守其输电运营商发出的每个操作指令，除非该操作无法实际执行，或违反安全、设备、监管或法律要求。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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, and Distribution Provider 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, or Distribution Provider may provide an attestation.

**M3.** 各平衡机构、发电机运营商和配电供应商应根据要求提供证据，证明其遵守了输电运营商发出的每个操作指令，除非该操作无法实际执行，或违反了安全、设备、监管或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。在这种情况下，平衡主管部门、发电机运营商和配电供应商应拥有并提供安全、设备、监管或法定要求的副本，作为不遵守输电运营商操作指令的证据。如果没有发生这种情况，平衡机构、发电机运营商或配电供应商可提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R4.** 各平衡机构、发电机运营商和配电供应商应告知其输电运营商其无法遵守其输电运营商发出的操作指令。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M4**. 各平衡机构、发电机运营商和配电供应商应根据要求提供证据，这些证据可能包括但不限于过去时期的运营商日志、录音或录音誊本、电子通信或电子或纸质格式的同等证据，说明其告知其输电运营商其无法遵守其发出的操作指令。如果这种情况并没有发生,平衡权威,发电机运营商或分布提供者可提供一个可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R5.** 每个输电运营商、发电机运营商和配电供应商都应遵守其平衡机构发出的每个操作指令，除非该操作无法实际执行，或违反安全、设备、法规或法律要求。*(违规风险因素:高)(时间:当天操作,实时操作)*

**M5.** Each Transmission Operator, Generator Operator, and Distribution Provider shall make available upon request, evidence that it complied with each Operating Instruction issued by its Balancing Authority 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.

**M5.** 每个输电运营商、发电机运营商和配电供应商应根据要求提供证据，证明其遵守了其平衡机构发出的每个操作指令，除非该操作无法实际执行，或违反了安全、设备、监管或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。在这种情况下，输电运营商、发电机运营商和配电提供商应拥有并提供安全、设备、法规或法定要求的副本，作为不遵守平衡机构操作指令的证据。未发生上述情形的，由输电运营商、发电运营商或配电运营商提供可信证明。

**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 its Balancing Authority. *[Violation Risk Factor: High] [Time Horizon: Same- Day Operations, Real-Time Operations]*

**R6.** 每个输电运营商、发电机运营商和配电供应商应告知其平衡机构其无法遵守其平衡机构发出的操作指令。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M6.** 每个输电运营商、发电机运营商和配电供应商应根据要求提供证据，这些证据可能包括但不限于过去时期的运营商日志、录音或录音誊本、电子通信或电子或纸质格式的同等证据，说明其已告知平衡机构其无法遵守其操作指令。未发生上述情形的，由输电运营商、发电运营商或配电供应商提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R7.** 每个输电运营商应在其可靠性协调区域内协助其他输电运营商，前提是提出请求的输电运营商已经实施了类似的应急程序，除非这种协助无法实际实施，或会违反安全、设备、监管或法律要求。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M7.** 每个输电运营商应根据要求提供相关证据，证明在其可靠性协调区域内，已向其他输电运营商提供类似要求的协助，除非此类协助无法实际实施，或违反了安全、设备、法规或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。如果没有收到援助请求，输电运营商可提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-Time Operations]*

**R8.** 每个输电运营商应将其实际或预期的导致或可能导致紧急情况的操作通知其可靠性协调员、已知受影响的平衡机构和已知受影响的输电运营商。*(违规风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M8.** 每个输电运营商应根据要求提供证据，证明其已将导致或可能导致紧急情况的实际或预期操作通知其可靠性协调员、已知受影响的平衡机构和已知受影响的输电运营商。证据可包括但不限于注明日期的操作员日志、语音记录或语音记录的抄本、电子通信或其他等效证据。未发生上述情形的，配电运营商可以提供可信证明。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning, Same-Day Operations, Real-Time Operations]*

**R9.** 对于遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信通道，每个平衡机构和输电运营商应将所有计划中断和30分钟以上的计划外中断通知其可靠性协调员和已知受影响的互联实体。*(违规风险因素:中等)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M9.** 每个平衡机构和输电运营商应提供证据，证明其已向其可靠性协调员和已知受影响的互联实体通报了所有计划中断，以及30分钟或以上的计划外中断，用于遥测和控制设备、监测和评估能力以及相关的通信通道。证据可包括但不限于注明日期的操作员日志、语音记录或语音记录的抄本、电子通信或其他等效证据。如果这种情况并没有发生,平衡机构或输电运营商可提供一个可信证明。

**R10.** Each Transmission Operator shall perform the following for determining System Operating Limit (SOL) exceedances within its Transmission Operator Area: *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R10.** 每个输电运营商应执行以下操作，以确定其输电运营商区域内的系统运行限值(SOL)超过:(*违规风险因素:高)(时间范围:实时运行)*

* 1. Monitor Facilities within its Transmission Operator Area;

**10.1.**  监控其输电运营商区域内的设施;

* 1. Monitor the status of Remedial Action Schemes within its Transmission Operator Area;

**10.2.** 监察其输电运营商范围内补救行动计划的状况;

* 1. Monitor non-BES facilities within its Transmission Operator Area identified as necessary by the Transmission Operator;

**10.3.** 根据输电运营商的需要，监控其输电运营商区域内的非BES设施;

* 1. Obtain and utilize status, voltages, and flow data for Facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator;

**10.4.** 获取和使用输电运营商认为必要的其输电运营商区域以外设施的状 态、电压和流量数据;

* 1. Obtain and utilize the status of Remedial Action Schemes outside its Transmission Operator Area identified as necessary by the Transmission Operator; and

**10.5.** 获取和利用输电运营商认为必要的输电运营商区域以外的补救行动 方案的状态;

* 1. Obtain and utilize status, voltages, and flow data for non-BES facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator.

**10.6.** 根据输电运营商的要求，获取并利用其输电运营商区域以外的非BES设备 的状态、电压和流量数据。

**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.

**M10.** 每个输电运营商应拥有并根据要求提供证据，包括但不限于能源管理系统描述文件、计算机打印输出、监控和数据采集(SCADA)数据收集或其他同等证据，用于确认其监控或获取和利用数据，以确定其输电运营商区域内任何系统运行限制(SOL)的超出。

**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 generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R11.** 每个平衡机构应监测其平衡管辖区域，包括影响发电或负载的补救行动计划的状态，以在其平衡管辖区域内维持发电-负载交换平衡，并支持互连频率。*(违反风险因素:高)(时间范围:实时操作)*

**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 generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.

**M11.** 每个平衡机构为了在其均衡权限范围内保持发电负载交换平衡，支持互连频率应具有并应要求提供证据，可包括但不限于能源管理系统描述文件、计算机打印件、SCADA数据收集，或用于确认其监控平衡机构领域的其他等效证据，包括影响发电或负荷的补救行动计划的状态。

**R12.** Each Transmission Operator shall not operate outside any identified Interconnection Reliability Operating Limit (IROL) for a continuous duration exceeding its associated IROL Tv. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R12.** 每个输电运营商不得在超过其相关联的IROL Tv的持续时间内超出任何已识别的互连可靠性运行限制(IROL)。*(违反风险因素:高)(时间范围:实时操作)*

**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 Tv. 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.

**M12.** 每个输电运营商应提供证据，表明其在任何已识别的互联可靠性运行限制(IROL)之外运行的任何情况下，持续时间不超过其关联的IROL Tv。这些证据可包括但不限于注明日期、时间、持续时间和功率骤增细节的电子或硬拷贝格式的注明日期的计算机日志或报告。如果尚未发生此类情况，输电运营商可以提供未发生事件的可信证明。

**R13.** Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R13.** 每个输电运营商应确保至少每30分钟进行一次实时评估。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M13.** 每个输电运营商应拥有并应要求提供证据，以证明其确保至少每30分钟进行一次实时评估。该证据可以包括但不限于显示评估执行时间的计算机日志、日期清单或其他证据。

**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. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R14.** 每个输电运营商应启动其操作计划，以减轻作为实时监测或实时评估一部分的SOL超标。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M14.** 每个输电运营商应有证据表明，它启动了其操作计划，以减轻SOL超标，这是其实时监测或实时评估的一部分。这一证据可以包括但不限于显示操作计划启动时间的日期的计算机日志、日期清单或其他证据。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Real-Time Operations]*

**R15.** 当超过SOL时，每个输电运营商应通知其可靠性协调人员为使系统恢复到一定范围所采取的行动。*(违反风险因素:中等)(时间范围:实时操作)*

**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.

**M15.** 每个输电运营商应提供证据，表明当超出SOL值时，其通知其可靠性协调程序已采取措施使系统恢复到限制范围内。这些证据可以包括但不限于注明日期的操作员日志、语音记录或语音记录的转录本、或注明日期的计算机打印输出。未发生上述情形的，输电运营商可以提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R16.** 每个输电运营商应向其系统运营商提供批准其遥测和控制设备的计划停机和维护、监控和评估能力以及受影响实体之间的相关通信信道的权限。(*违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M16.** 每个输电运营商应拥有并应要求提供证据，包括但不限于文件化程序或同等证据，用于确认输电运营商已向其系统运营商提供授权，以批准计划中断和远程测量和控制设备的维护、监测和评估能力，以及受影响实体之间的相关通信渠道。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R17.** 每个平衡机构应向其系统操作员提供授权，以批准计划中的中断和对其遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信通道的维护。*(违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M17.** 每个平衡机构应拥有并应要求提供证据，包括但不限于文件化程序或同等证据，用于确认平衡机构已向其系统操作人员提供了批准计划中断和对其遥测和控制设备、监测和评估能力以及受影响实体之间相关通信渠道的权限。

**R18.** Each Transmission Operator shall operate to the most limiting parameter in instances where there is a difference in SOLs. [*Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R18.** 在SOLs存在差异时，每个输电运营商都应以最大的限制参数进行操作。*(违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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 ost limiting parameter in instances where there is a difference in SOLs.

**M18.** 每个输电运营商应拥有并根据要求提供证据，包括但不限于运营商日志、语音记录、电子通信或同等证据，用于确定在SOLs差异的情况下，其操作是否达到ost限制参数。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R19.** 每个输电运营商应具有与它所识别的需要数据的实体进行数据交换的能力，以便执行其业务规划分析。*(违反风险因素:中等)(时间范围:运营计划)*

**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.

**M19.** 每个输电运营商应拥有并应要求提供证据，这些证据可能包括但不限于:运营商日志、系统规范、系统图或其他证据，证明其与其确定需要数据的实体具有数据交换能力，以便进行运营计划分析。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

**R20.**  每个输电运营商应具备数据交换能力，并在其主要控制中心内建立冗余和多种路由的数据交换基础设施，以便与其可靠性协调机构、平衡机构和其确定需要数据的实体进行实时数据交换，以便进行实时监控和实时评估。*(违反风险因素:高)(时间:当天操作,实时操作)*

**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.

**M20.** 每个输电运营商应根据要求提供证据，包括但不限于系统规范、系统图或其他列出其数据交换能力的文件，包括输电运营商主要控制中心内冗余和分散路由的数据交换基础设施，以便与其可靠性协调器、平衡机构进行实时数据交换，它所确定的实体需要数据，以便按照要求进行实时监测和实时评估。

**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. *[Violation Risk Factor: Medium ] [Time Horizon: Operations Planning]*

**R21.** 每个输电运营商应至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换能力的冗余功能。如果测试失败，输电运营商应在两小时内采取行动恢复冗余功能。*(违反风险因素:中等)(时间范围:行动计划)*

**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 the 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.

**M21.** 每个输电运营商应拥有并应要求提供证据，证明其测试了要求R20中规定的冗余功能的主要控制中心数据交换功能，或经历了证明冗余功能的事件;并且，如果测试不成功，在两个小时内启动操作，以恢复需求R21中指定的冗余功能。证据可以包括但不限于:有日期和时间戳的测试记录、操作员日志、语音记录或电子通信。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R22.** 每个平衡机构应具有与其确定需要数据的实体进行数据交换的能力，以便为第二天的行动制定运营计划。*(违反风险因素:中等)(时间范围:行动计划)*

**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.

**M22.** 每个平衡机构应拥有并应要求提供证据，这些证据可能包括但不限于:操作员日志、系统规范、系统图或其他证据，证明其与其确定需要数据的实体具有数据交换能力，以便为第二天的操作制定运营计划。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

**R23.** 每个平衡机构应具备数据交换能力，在平衡机构的主要控制中心内设置冗余的、路由多样的数据交换基础设施，以便与其可靠性协调者、输电运营商以及确定需要数据的实体进行实时数据交换，以实现其实时监控和分析功能。*(违反风险因素:高)(时间:当天操作,实时操作)*

**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.

M23. 每个平衡机构应具备并应请求提供证据，可包括但不限于系统规范、系统图或列出其数据交换能力的其他文件，包括平衡权主要控制中心内冗余和分散路由的数据交换基础设施，用于与其可靠性协调员、输电运营商交换实时数据，为了执行需求中指定的实时监控和分析功能，它所识别的实体需要从中获取数据。

**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. *[Violation Risk Factor: Medium ] [Time Horizon: Operations Planning]*

**R24.** 每个平衡机构应至少每90个日历天测试一次要求R23中规定的主要控制中心数据交换能力的冗余功能。如果测试不成功，平衡机构将在两小时内启动操作来恢复冗余功能。*(违反风险因素:中等)(时间范围:行动计划)*

**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.

**M24.** 每个平衡机构应拥有并应要求提供证据，证明其对需求R23中规定的冗余功能的主要控制中心数据交换能力进行了测试，或经历了证明冗余功能的事件;并且，如果测试不成功，在两个小时内启动操作，以恢复需求R24中指定的冗余功能。证据可以包括但不限于:有日期和时间戳的测试记录、操作员日志、语音记录或电子通信。

# Compliance C.合规手段

## Compliance Monitoring Process: 1.合规监控过程:

* + 1. **Compliance Enforcement Authority:**

“Compliance Enforcement Authority” means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

* 1. **合规执法机构:**

“合规执行机构”系指NERC或区域实体，或由适用的政府机构指定的任何实体，在各自的管辖范围内各自履行监督和/或强制执行可靠性标准的职责。

## Evidence Retention: 1.2. 保留证据:

The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

以下证据保留期限指实体被要求保留特定证据以证明合规的期限。如果以下规定的证据保留期比上次审计后的时间短，合规执行机构可以要求实体提供其他证据，以证明其在上次审计后的全职期间是合规的。

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

适用实体应保存数据或证据，以证明符合下述规定，除非其合规执行机构指示将特定证据保留较长时间，作为调查的一部分。

* Each Balancing Authority, Transmission Operator, Generator Operator, and Distribution Provider shall each keep data or evidence for each applicable Requirement R1 through R11, and Measure M1 through M11, for the current calendar year and one previous calendar year, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
* 各平衡机构、输电运营商、发电机运营商和配电供应商应各自保存当前日历年和之前一年适用要求R1至R11以及检测M1至M11的数据或证据，且应保留至少90公历日的运营商日志和语音记录除外，除非遵约执法部门指示将特定证据保留更长的时间，作为调查的一部分。
* Each Transmission Operator shall retain evidence for three calendar years of any occasion in which it has exceeded an identified IROL and its associated IROL Tv as specified in Requirement R12 and Measure M12.
* 每个输电运营商应在超过R12和M12要求中规定的已识别的IROL及其相关的IROL Tv的任何情况下保留三个公历年的证据。
* Each Transmission Operator shall keep data or evidence for Requirement R13 and Measure M13 for a rolling 30-day period, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
* 每个输电运营商应保存滚动的30天内的要求R13和检测M13的数据或证据,除非由其合规执法机构保留更长一段时间的具体证据,作为调查的一部分。
* Each Transmission Operator shall retain evidence and that it initiated its Operating Plan to mitigate a SOL exceedance as specified in Requirement R14 and Measurement M14 for three calendar years.
* 每个输电运营商应保留其启动其运营计划以在三个公历年内减轻R14和M14中规定的SOL超过的情况的证据。
* Each Transmission Operator and Balancing Authority shall each keep data or evidence for each applicable Requirement R15 through R19, and Measure M15 through M19 for the current calendar year and one previous calendar year, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个输电运营商和平衡机构应各自保存每个适用要求R15至R19的数据或证据，并对当前公历年和之前的一个公历年检测M15至M19，但操作员日志和语音记录除外，该记录应至少保留90个公历日。
* Each Transmission Operator shall keep data or evidence for Requirement R20 and Measure M20 for the current calendar year and one previous calendar year.
* 每个输电运营商应保存适用于当前公历年和之前的一个公历年的要求R20和检测M20的数据或证据。
* Each Transmission Operator shall keep evidence for Requirement R21 and Measure M21 for the most recent twelve calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个输电运营商要保留最近12个公历月的R21和检测M21证据,但操作日志和语音记录除外，它们应保留至少90个公历日。
* Each Balancing Authority shall keep data or evidence for Requirement R22 and Measure M22 for the current calendar year and one previous calendar year,

with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.

每个平衡机构应保存当前公历年和之前的一个公历年要求R22和检测M22的数据或证据，但操作员日志和语音记录除外，它们应至少保留90个公历日。

* Each Balancing Authority shall keep data or evidence for Requirement R23 and Measure M23 for the current calendar year and one previous calendar year.
* 每个平衡机构应保存当前公历年和之前的一个公历年要求R23的和检测M23数据或证据。
* Each Balancing Authority shall keep evidence for Requirement R24 and Measure M24 for the most recent twelve calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个平衡机构应保存最近12个日历月要求R24和检测M24的证据，但操作员日志和语音记录应至少保留90个日历天。

## 1.3. Compliance Monitoring and Enforcement Program

## 1.3. 合规性监视和执行程序

As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

按照NERC程序规则的定义，“合规性监测和执行计划”指的是将用于评估数据或信息的过程的识别，以评估相关可靠性标准的性能或结果。

# Violation Severity Levels 违规严重性级别

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| **R #** | **Violation Severity Levels违反严重性级别** | | | |
| **Lower VSL**  **低违规级别** | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | **Severe VSL**  **严重违规级别** |
| **R1** | N/A | N/A | N/A | The Transmission Operator failed to act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions.  输电运营商未能通过自己的行动或发布操作指令来维持其输电运营商区域的可靠性。 |
| **R2** | N/A | N/A | N/A | The Balancing Authority failed to act to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions.  平衡机构未能通过自己的行动或发布操作指示来维持其平衡机构区域的可靠性。 |
| **R3** | N/A | N/A | N/A | The responsible entity did not comply with an Operating Instruction issued by the Transmission Operator, and such action could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  负责任的实体没有遵守输电运营商发出的操作指令，这种行为本可以实际执行，不会违反安全、设备、监管或法律要求。 |
| **R4** | N/A | N/A | N/A | The responsible entity did not inform its Transmission Operator of its inability to comply with an Operating Instruction issued by its Transmission Operator.  负责单位未告知其输电运营商其未能遵守其输电运营商发出的操作指示。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R5** | N/A | N/A | | | N/A | | The responsible entity did not comply with an Operating Instruction issued by the Balancing Authority, and such action could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  负责的实体不遵守平衡机构发出的作业指导书，而这种行动本可以实际执行，不会违反安全、设备、监管或法定要求。 |
| **R6** | N/A | N/A | | | N/A | | The responsible entity did not inform its Balancing Authority of its inability to comply with an Operating Instruction issued by its Balancing Authority.  负责实体没有通知其平衡机构它没有能力遵守其平衡机构发出的操作指示。 |
| **R7** | N/A | N/A | | | N/A | | The Transmission Operator did not provide comparable assistance to other Transmission Operators within its Reliability Coordinator Area, when requested and able, and the requesting entity had implemented its Emergency procedures, and such actions could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  在接到请求时，输电运营商没有向其可靠性协调区域内的其他输电运营商提供相当的的援助，而且请求实体已经执行了紧急程序，且这种行动可以实际执行，不会违反安全、设备、监管或法律要求。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R8** | The Transmission Operator did not inform one known impacted Transmission Operator or 5% or less of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商没有将其实际操作或预期操作导致或可能导致相关输电运营商区域发生紧急情况的情况告知一个已知受影响的输电运营商或5%或以下已知受影响的输电运营商(以两者中较大者为准)。  OR,  The Transmission Operator did not inform one known impacted Balancing Authorities or 5% or less of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相应的平衡管理区域发生紧急情况)通知某一已知受影响的平衡管理机构或5%或以下已知受影响的平衡管理机构(以两者中较大的一个为准)。 | The Transmission Operator did not inform two known impacted Transmission Operators or more than 5% and less than or equal to 10% of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商未向两个已知受影响的输电运营商(或大于5%、小于或等于10%的已知受影响输电运营商)通报其实际操作或预期操作导致或可能导致相关输电运营商区域发生紧急情况的情况。  OR,  The Transmission Operator did not inform two known impacted Balancing Authorities or more than 5% and less than or equal to 10% of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相关平衡管理区域发生紧急情况)通知两个已知受影响平衡管理机构或大于5%且小于或等于已知受影响平衡管理机构(以两者中较大的一个为准)。 | | | The Transmission Operator did not inform three known impacted Transmission Operators or more than 10% and less than or equal to 15% of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商没有向三个已知受影响的输电运营商或超过10%、小于或等于15%的已知受影响的输电运营商(以两者中较大者为准)通报其实际或预期的导致或可能导致相关输电运营商区域发生紧急情况的操作。  OR,  The Transmission Operator did not inform three known impacted Balancing Authorities or more than 10% and less than or equal to 15% of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相关平衡管理区域发生紧急情况)通知三个已知受影响平衡管理机构或大于10%且小于或等于已知受影响平衡管理机构的15%(以两者中较大的一个为准)。 | | The Transmission Operator did not inform its Reliability Coordinator of its actual or expected operations that resulted in, or could have resulted in, an Emergency on those respective Transmission Operator Areas.  输电运营商没有将其实际或预期的操作导致或可能导致相关输电运营商区域发生紧急情况的情况通知其可靠性协调员。  OR  The Transmission Operator did not inform four or more known impacted Transmission Operators or more than 15% of the known impacted Transmission Operators of its actual or expected operations that resulted in, or could have resulted in, an Emergency on those respective Transmission Operator Areas.  或者，  输电运营商没有通知4个或4个以上已知受影响的输电运营商或超过15%已知受影响的输电运营商，其实际或预期的操作导致或可能导致在这些各自的输电运营商区域发生紧急情况。  OR,  The Transmission Operator did not inform four or more known impacted Balancing Authorities or more than 15% of the known impacted Balancing Authorities of its actual or expected operations that resulted in, or  could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商没有向四个或四个以上的已知受影响平衡机构或超过15%的已知受影响平衡机构通报其实际或预期的导致或可能导致相应平衡机构区域发生紧急情况的操作。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R9** | The responsible entity did not notify one known impacted interconnected entity or 5% or less of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未向一个已知受影响的互联实体或已知受影响实体的5%或以下(以两者中较大者为准)通知计划中断，或30分钟或更长时间的计划外中断。 | The responsible entity did not notify two known impacted interconnected entities or more than 5% and less than or equal to 10% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未将计划中断或30分钟以上的计划外中断通知两个已知受影响相互关联的实体，或大于5%、小于或等于10%的已知受影响实体(以两者中较大者为准)。 | | | The responsible entity did not notify three known impacted interconnected entities or more than 10% and less than or equal to 15% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未通知三个已知受影响相互关联的实体或超过10%、小于或等于15%已知受影响实体(以两者中较大者为准)的计划中断，或30分钟或以上的计划外中断。 | | The responsible entity did not notify its Reliability Coordinator of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels.  对于遥测和控制设备、监视和评估能力以及相关通信通道的计划停机或30分钟以上的计划外停机，责任实体未通知其可靠性协调器。  OR,  The responsible entity did not notify four or more known impacted interconnected entities or more than 15% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  或者，  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体没有通知四个或四个以上已知受影响相互关联的实体或15%以上已知受影响实体(以较大的实体为准)的计划中断，或30分钟或更长时间的计划外中断。 |
| **R10** | The Transmission Operator did not monitor, obtain, or utilize one of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6.  输电运营商未监控、获取或使用输电运营商要求或确定的且在要求R10第10.1至10.6部分中列出的项目之一。 | The Transmission Operator did not monitor, obtain, or utilize two of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6  输电运营商没有监控、获取或利用输电运营商所要求的或确定的、列于需求R10第10.1至10.6部分的两个项目 | | | The Transmission Operator did not monitor, obtain, or utilize three of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6.  输电运营商没有监控、获取或利用要求R10 第10.1至10.6部分中列出的输电运营商所要求或确定的必要物品中的三种。 | | The Transmission Operator did not monitor, obtain, or utilize four or more of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10 Part 10.1 through 10.6.  输电运营商未监控、获取或利用要求R10第10.1至10.6部分中所列的输电运营商所要求或确定的四种或四种以上的必要物品。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R11** | N/A | N/A | | | The Balancing Authority did not monitor the status of Remedial Action Schemes that impact generation or Load, in order to maintain generation-Load- interchange balance within its Balancing Authority Area and support Interconnection frequency.  平衡机构没有监测影响发电或负载的补救行动方案的状态，以便在其平衡机构范围内维持发电-负载-交换平衡并支持互连频率。 | | The Balancing Authority did not monitor its Balancing Authority Area, in order to maintain generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.  平衡机构没有监控其平衡机构区域，以维护其平衡机构区域内的生成负载-交换平衡并支持互连频率。 |
| **R12** | N/A | N/A | | | N/A | | The Transmission Operator exceeded an identified Interconnection Reliability Operating Limit (IROL) for a continuous duration greater than its associated IROL Tv.  输电运营商在持续时间大于其相关IROL Tv的情况下，超过了确定的互连可靠性操作限制(IROL)。 |
| **R13** | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for one 30- minute period within that 24-hour period.  对于30天保留期内的24小时内的任何样本，输电运营商的实时评估没有在24小时内进行30分钟的评估。 | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for two 30-minute periods within that 24-hour period.  在30天保留期内的任何24小时样本，在该24小时期内的两个30分钟内，输电运营商都没有进行实时评估。 | | | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for three 30- minute periods within that 24- hour period.  对于30天保留期内的任何24小时样本，输电运营商没有在24小时内进行3次30分钟的实时评估。 | | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for four or more 30-minute periods within that 24-hour period.  对于30天保留期内的任何24小时样本，输电运营商不会在该24小时内进行4次或更多次30分钟的实时评估。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R14.** | N/A | N/A | | | N/A | | The Transmission Operator did not initiate its Operating Plan for mitigating a SOL exceedance identified as part of its Real- time monitoring or Real-time Assessment  在实时监测或实时评估中，输电运营商并没有启动降低SOL超标的作业计划 |
| **R15.** | N/A | N/A | | | N/A | | The Transmission Operator did not inform its Reliability Coordinator of actions taken to return the System to within limits when a SOL had been exceeded.  当超出SOL时，输电运营商没有通知其可靠性协调器将系统返回到限制范围内所采取的行动。 |
| **R16.** | N/A | N/A | | | N/A | | The Transmission Operator did not 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.  输电运营商没有向其系统运营商提供授权，以批准计划中的停机和维护其遥测和控制设备、监视和评估能力，以及受影响实体之间的相关通信通道。 |
| **R17.** | N/A | N/A | | | N/A | | The Balancing Authority did not 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.  平衡机构没有向其系统运营商提供权力，以核准计划中的中断和维修其遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信渠道。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R18** | N/A | N/A | | | N/A | | The Transmission Operator failed to operate to the most limiting parameter in instances where there was a difference in SOLs.  在SOLs存在差异的情况下，输电运营商不能操作到最极限的参数。 |
| **R19** | The Transmission Operator did not have data exchange capabilities for performing its Operational Planning Analyses with one identified entity, or 5% or less of the applicable entities, whichever is greater.  输电运营商没有数据交换能力，无法与一个确定的实体或5%或更少的适用实体(以较大者为准)进行业务规划分析。 | The Transmission Operator did not have data exchange capabilities for performing its Operational Planning Analyses with two identified entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.  输电运营商不具备数据交换能力，无法与两个确定的实体或超过5%或小于或等于10%的适用实体(以较大者为准)进行业务规划分析。 | | | The Transmission Operator did not have data exchange capabilities for performing its Operational Planning Analyses with three identified entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.  输电运营商没有数据交换能力，无法与三个确定的实体或超过10%或小于或等于15%的适用实体(以较大者为准)进行业务计划分析。 | | The Transmission Operator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more identified entities or greater than 15% of the applicable entities, whichever is greater.  输电运营商不具备数据交换能力，无法与4个或4个以上已确定的实体或超过15%的适用实体(以较大者为准)进行业务规划分析。 |
| **R20** | N/A | N/A | | | The Transmission Operator had data exchange capabilities with its Reliability Coordinator, Balancing Authority, and identified entities for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Transmission  Operator's primary Control Center, as specified in the Requirement.  输电运营商具有数据交换能力，其可靠性协调器、平衡机构和用于执行实时监控和实时评估的识别实体，但在输电运营商的主要控制中心内没有需求中指定的冗余和不同路由的数据交换基础设施。 | | The Transmission Operator did not have data exchange capabilities with its Reliability Coordinator, Balancing Authority, and identified entities for performing Real-time monitoring and Real-time Assessments as specified in the Requirement.  输电运营商不具备数据交换能力，不具备可靠性协调器、平衡机构，也不具备执行需求中指定的实时监控和实时评估的实体。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | | **Severe VSL**  **严重违规级别** | |
| **R21** | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test;  输电运营商测试了需求R20中为冗余功能指定的主要控制中心数据交换能力，但自上次测试以来，测试时间超过90个日历天，但少于或等于120个日历天; | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来已经进行了超过120个日历天但小于或等于150个日历天的测试; | | | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过150个日历天，但小于或等于180个日历天;  OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过6小时且小于或等于8小时的时间内启动恢复冗余功能的操作。 | | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 180 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来已经进行了超过180个日历天;  OR |
|  | OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过2小时和小于或等于4小时的时间内启动恢复冗余功能的操作。 | OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过4小时且小于或等于6小时的时间内启动恢复冗余功能的操作。 | | | The Transmission Operator did  not test its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality;  或者，  输电运营商没有测试要求R20中规定的主要控制中心数据交换功能的冗余功能;  OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not  initiate action within 8 hours to  restore the redundant functionality.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在8小时内没有采取行动恢复冗余功能。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | |
| **Lower VSL**  **低违规级别** | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | **Severe VSL**  **严重违规级别** |
| **R22** | The Balancing Authority did not have data exchange capabilities for developing its Operating Plan with one identified entity, or 5% or less of the applicable entities, whichever is greater.  平衡机构没有数据交换能力来与一个已确定的实体或5%或更少的适用实体(以较大者为准)开发其业务计划。 | The Balancing Authority did not have data exchange capabilities for developing its Operating Plan with two identified entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.平衡机构没有数据交换能力来与两个已确定的实体或超过适用实体的5%或小于或等于10%(以较大者为准)开发其业务计划。 | The Balancing Authority did not have data exchange capabilities for developing its Operating Plan with three identified entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.  平衡机构没有数据交换能力来与两个已确定的实体或超过适用实体的10%或小于或等于15%(以较大者为准)开发其业务计划。 | The Balancing Authority did not have data exchange capabilities for developing its Operating Plan with four or more identified entities or greater than 15% of the applicable entities, whichever is greater.  平衡机构没有数据交换能力来与一个已确定的实体或15%或更多的适用实体(以较大者为准)开发其业务计划。 |
| **R23** | N/A | N/A | The Balancing Authority had data exchange capabilities with its Reliability Coordinator, Transmission Operator, and identified entities for performing Real-time monitoring and analysis functions, but did not have redundant and diversely routed data exchange infrastructure within the Balancing Authority's primary Control Center, as specified in the Requirement.  平衡机构与其可靠性协调人员、输电运营商以及用于执行实时监视和分析功能的已识别实体具有数据交换功能，但在平衡机构的主要控制中心内没有冗余和分散路由的数据交换基础设施(如需求中所述)。 | The Balancing Authority did not have data exchange capabilities with its Reliability Coordinator, Transmission Operator, and identified entities for performing Real-time monitoring and analysis functions as specified in the Requirement.  平衡机构没有与可靠性协调人员、输电运营商和标识的实体进行数据交换的能力，以执行需求中指定的实时监视和分析功能。 |

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| **R #** | **Violation Severity Levels违反严重性级别** | | | |
| **Lower VSL**  **低违规级别** | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | **Severe VSL**  **严重违规级别** |
| **R24** | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but  did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能，以确定冗余功能，但是自上次测试以来超过90个日历天但小于或等于120个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过2小时且小于或等于4小时内恢复冗余功能的操作。 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 120 calendar  days but less than or equal to 150 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了120个日历天，但小于或等于150个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过4小时且小于或等于6小时内恢复冗余功能的操作 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了150个日历天，但小于或等于180个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过6小时且小于或等于8小时内恢复冗余功能的操作 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 180 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了180个日历天  OR  The Balancing Authority did not test its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality;  或者，  平衡机构没有测试其在需求R23中为冗余功能指定的主要控制中心数据交换能力;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，没有在8小时内恢复冗余功能的操作 |

1. **Regional Variances D. 区域变化**

None. 无。

# Associated Documents E.相关文件

The Implementation Plan and other project documents can be found on the [project page.](http://www.nerc.com/pa/Stand/Pages/Project-2016-01-Modifications-to-TOP-and-IRO-Standards.aspx)

在项目页面可以找到实施计划和其他项目文件。

The Project 2014-03 SDT has created the SOL Exceedance White Paper as guidance on SOL issues and the URL for that document is: [http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx.](http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx)

项目2014-03 SDT已经创建了SOL超越数白皮书作为SOL问题的指导，该文件的网址是:

[http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx.](http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx)

Operating Plan - An Operating Plan includes general Operating Processes and specific Operating Procedures. It may be an overview document which provides a prescription for an Operating Plan for the next-day, or it may be a specific plan to address a specific SOL or IROL exceedance identified in the Operational Planning Analysis (OPA). Consistent with the NERC definition, Operating Plans can be general in nature, or they can be specific plans to address specific reliability issues. The use of the term Operating Plan in the revised TOP/IRO standards allows room for both. An Operating Plan references processes and procedures, including electronic data exchange, which are available to the System Operator on a daily basis to allow the operator to reliably address conditions which may arise throughout the day. It is valid for tomorrow, the day after, and the day after that. Operating Plans should be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an OPA or a Real-time Assessment (RTA). As the definition in the Glossary of Terms states, a restoration plan is an example of an Operating Plan. It contains all the overarching principles that the System Operator needs to work his/her way through the restoration process. It is not a specific document written for a specific blackout scenario but rather a collection of tools consisting of processes, procedures, and automated software systems that are available to the operator to use in restoring the system. An Operating Plan can in turn be looked upon in a similar manner. It does not contain a prescription for the specific set-up for tomorrow but contains a treatment of all the processes, procedures, and automated software systems that are at the operator’s disposal. The existence of an Operating Plan, however, does not preclude the need for creating specific action plans for specific SOL or IROL exceedances identified in the OPA. When a Reliability Coordinator performs an OPA, the analysis may reveal instances of possible SOL or IROL exceedances for pre- or post-Contingency conditions. In these instances, Reliability Coordinators are expected to ensure that there are plans in place to prevent or mitigate those SOLs or IROLs, should those operating conditions be encountered the next day. The Operating Plan may contain a description of the process by which specific prevention or mitigation plans for

day-to-day SOL or IROL exceedances identified in the OPA are handled and communicated. This approach could alleviate any potential administrative burden associated with perceived requirements for continual day-to-day updating of “the Operating Plan document” for compliance purposes.

操作计划——一个操作计划包括一般操作流程和具体的操作程序。它可以是一份概述文件，提供第二天的操作计划的处方，也可以是一份具体计划，以解决操作计划分析(OPA)中确定的特定SOL或IROL超标情况。与NERC的定义一致，操作计划可以是一般性质的，也可以是解决特定可靠性问题的具体计划。在修订的TOP/IRO标准中使用操作计划，为两者都留有余地。操作计划参考了包括电子数据交换在内的程序和程序，系统操作员每天都可以使用这些程序和程序，使操作员能够可靠地处理一天中可能出现的情况。有效期为明天、后天、大后天。操作计划应由临时操作指南加以补充，这些临时操作指南概述了OPA或实时评估(RTA)每天确定的特定情况的预防/缓解计划。正如术语表中的定义所述，恢复计划是操作计划的一个示例。它包含了系统操作员在恢复过程中所需要的所有总体原则。它不是为特定的停电场景编写的具体文件，而是由操作人员在恢复系统时可使用的过程、程序和自动化软件系统组成的工具集合。操作计划也可以以同样的方式来看待。它不包含明天的具体设置的处方，但包含了操作员处置的所有过程、程序和自动化软件系统的处理。然而，操作计划的存在并不排除为OPA中确定的特定SOL或IROL超标情况制定具体行动计划的必要性。当可靠性协调器执行OPA时，分析可能会揭示事故发生前或事故发生后SOL或IROL超标的实例。在这种情况下，可靠性协调人员应确保有预防或减少SOLs或irol的计划，以防第二天遇到这些运行条件。操作计划可包括对处理和通报外地处理方案中确定的每日SOL或IROL超标的具体预防或缓解计划的过程的说明。这种方法可以减轻任何潜在的管理负担，这些负担与为了遵从性目的而对“操作计划文件”进行持续的日常更新的可感知的需求有关。

# Version History 版本历史

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| --- | --- | --- | --- |
| **Version**  **版本** | **Date**  **日期** | **Action**  **行动** | **Change Tracking**  **变更追踪** |
| 0 | April 1,  2005  2005年4月1日 | Effective Date  生效日期 | New  新 |
| 0 | August 8,  2005  2005年8月8日 | Removed “Proposed” from Effective Date  从生效日期中删除“建议”一词 | Errata  勘误 |
| 1 | November 1, 2006  2006年11月1日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 1a | May 12,  2010  2010年5月12日 | Added Appendix 1 – Interpretation of R8 approved by Board of Trustees on May 12, 2010  增加附录1 - 2010年5月12日理事会批准的R8解释 | Interpretation  解释 |
| 1a | September 15, 2011  2011年9月15日 | FERC Order issued approved the Interpretation of R8 (FERC Order became effective November 21, 2011)  发布的FERC命令批准了对R8的解释(FERC命令于2011年11月21日生效) | Interpretation  解释 |
| 2 | May 6,  2012  2012年5月6日 | Revised under Project 2007-03  在2007-03计划下修订 | Revised  校订 |
| 2 | May 9,  2012  2012年5月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 3 | February 12, 2015  2015年2月12日 | Adopted by Board of Trustees  经理事会通过 | Revisions under Project 2014-03  在项目2014-03校订 |
| 3 | November 19, 2015  2015年11月19日 | FERC approved TOP-001-3. Docket No. RM15-16-000. Order No. 817.  FERC批准TOP-001-3。审单编号RM15 -16-000号。命令817号。 | Approved  同意 |
| 4 | February 9, 2017  2017年2月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 4 | April 17,  2017  2017年4月17日 | FERC letter Order approved TOP-001-   1. Docket No. RD17-4-000 2. FERC批准的信件命令TOP-001-4。摘要编号RD17-4-000 |  |

**Guidelines and Technical Basis 指引及技术基础**

None 无

# Rationale 理论基础

During development of TOP-001-4, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of TOP-001-4, the text from the rationale text boxes will be moved to this section.

在TOP-001-4的开发过程中，文本框被嵌入到标准中，以解释标准各个部分的基本原理。董事会通过TOP-001-4后，理论基础中的内容将移至本节。

Rationale text from the development of TOP-001-3 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 [project page](http://www.nerc.com/pa/Stand/Pages/Project-2014-03-Revisions-to-TOP-and-IRO-Standards.aspx).

以下是项目2014-03中TOP-001-3开发的基本原理。其他信息可在项目2014-03项目页面上找到。

## Rationale for Requirement R3:

The phrase ‘cannot be physically implemented’ means that a Transmission Operator may request something to be done that is not physically possible due to its lack of knowledge of the system involved.

**要求R3的基本原理:**

短语“不能在根本上实现”是指输电运营商可能由于其对所涉及的系统缺乏知识而请求在根本上不可能完成的事情。

## Rationale for Requirement R10: 要求R10的基本原理:

New proposed Requirement R10 is derived from approved IRO-003-2, Requirement R1, adapted to the Transmission Operator Area. This new requirement is in response to NOPR paragraph 60 concerning monitoring capabilities for the Transmission Operator. New Requirement R11 covers the Balancing Authorities. Monitoring of external systems can be accomplished via data links.

新提议的要求R10源自经批准的IRO-003-2要求R1，适用于输电运营商区域。这项新要求是对NOPR第60段关于输电运营商监控能力的响应。新的需求R11涵盖了平衡权威。外部系统的监控可以通过数据链路来完成。

The revised requirement addresses directives for Transmission Operator (TOP) monitoring of some non-Bulk Electric System (BES) facilities as necessary for determining System Operating Limit (SOL) exceedances (FERC Order No. 817 Para 35-36). The proposed requirement corresponds with approved IRO-002-4 Requirement R4 (proposed IRO-002-5 Requirement R5), which specifies the Reliability Coordinator's (RC) monitoring responsibilities for determining SOL exceedances.

修订后的规定针对输电运营商(TOP)监测一些非大型电力系统(BES)设施以确定系统运行极限(SOL)超出所需的指令(FERC第817号命令第35-36段)。拟议的要求符合已批准的IRO-002-4要求R4(拟议的IRO-002-5要求R5)，该要求规定了可靠性协调者(RC)对确定SOL超出的监控责任。

The intent of the requirement is to ensure that all facilities (i.e., BES and non-BES) that can adversely impact reliability of the BES 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.

该要求的目的是确保对所有可能对BES可靠性产生不利影响的设施(即BES和非BES)进行监测。正如TOP和IRO可靠性标准所使用的，监控包括实时观察运行状态和运行值，以了解系统状况。确定SOL超标所必需的设施应指定为BES的一部分，或通过规划和运行研究(如TOP-002-4要求R1和IRO-008-2要求的运行计划分析(OPA))确定后纳入监测。SDT认识到，并非所有最高管理者认为满足其监测需要的非最佳预算外设施都需要包括在最佳预算内。

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 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 the TOP to identify a non-BES facility that should be temporarily monitored for determining SOL exceedances.

上层要求监测的非预算外设施仅是上层在其输电运营商范围内确定SOL超标所需的设施。在执行各种分析和研究作为功能性的义务的一部分,可能会导致识别non-BES设施应监测确定溶胶超过数点。例子包括:

* OPA;
* 实时评估(RTA)；
* 由TOP执行的裂解作为BES异常处理的一部分，用于在BES中包括一个设;和
* 可在RC的大修协调过程中指定的分析，该分析可引导TOP确定应临时监控的非BES设施，以确定SOL超标。

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.

TOP-003-3要求R1规定，TOP应制定数据规范，其中包括TOP支持OPAs、实时监控和RTAs所需的数据和信息。这包括高层认为必要的非bes数据和外部网络数据。

The format of the proposed requirement has been changed from the approved standard to more clearly indicate which monitoring activities are required to be performed.

拟议要求的格式已从批准的标准改为更清楚地表明需要进行哪些监测活动。

## Rationale for Requirement R13: 要求R13的基本原理：

The new Requirement R13 is in response to NOPR paragraphs 55 and 60 concerning Real-time analysis responsibilities for Transmission Operators and is copied from approved IRO-008-1, Requirement R2. The Transmission Operator’s Operating Plan will describe how to perform the Real-time Assessment. The Operating Plan should contain instructions as to how to perform Operational Planning Analysis and Real-time Assessment with detailed instructions and timing requirements as to how to adapt to conditions where processes, procedures, and automated software systems are not available (if used). This could include instructions such as an indication that no actions may be required if system conditions have not changed significantly and that previous Contingency analysis or Real-time Assessments may be used in such a situation.

新的要求R13是对NOPR第55段和第60段关于输电运营商实时分析责任的响应，并从批准的IRO-008-1，要求R2中复制。输电运营商的运营计划将描述如何执行实时评估。操作计划应包含如何执行操作计划分析和实时评估的说明，以及如何适应流程、程序和自动化软件系统不可用（如果使用）的条件的详细说明和时间要求。这可能包括指示，例如，如果系统条件没有发生重大变化，则无需采取任何行动，在这种情况下，可以使用先前的应急分析或实时评估。

## Rationale for Requirement R14: 要求R14的基本原理：

The original Requirement R8 was deleted and original Requirements R9 and R11 were revised in order to respond to NOPR paragraph 42 which raised the issue of handling all SOLs and not just a sub-set of SOLs. The SDT has developed a white paper on SOL exceedances that explains its intent on what needs to be contained in such an Operating Plan. These Operating Plans are developed and documented in advance of Real-time and may be developed from Operational Planning Assessments required per proposed TOP-002-4 or other assessments. Operating Plans could be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an Operational Planning Assessment or a Real-time Assessment. The intent is to have a plan and philosophy that can be followed by an operator.

删除了原始要求R8，修订了原始要求R9和R11，以响应NOPR第42段，该段提出了处理所有SOL而不仅仅是SOL子集的问题。SDT已经制定了一份关于SOL超标的白皮书，解释了其在此类运营计划中需要包含哪些内容的意图。这些运行计划是在实时之前制定和记录的，可以根据建议的TOP-002-4或其他评估要求的运行计划评估制定。可通过临时操作指南对操作计划进行补充，临时操作指南概述了日常操作计划评估或实时评估中确定的特定情况的预防/缓解计划。其目的是要有一个计划和哲学，可以遵循一个经营者。

## Rationale for Requirements R16 and R17: 要求R16和R17的基本原理：

In response to IERP Report recommendation 3 on authority.

针对关于权力的IERP报告建议3。

## Rationale for Requirement R18: 要求R18的基本原理：

Moved from approved IRO-005-3.1a, Requirement R10. Transmission Service Provider, Distribution Provider, Load-Serving Entity, Generator Operator, and Purchasing-Selling Entity are deleted as those entities will receive instructions on limits from the responsible entities cited in the requirement. Note – Derived limits replaced by SOLs for clarity and specificity. SOLs include voltage, Stability, and thermal limits and are thus the most limiting factor.

源于批准的要求R10的IRO-005-3.1a。输电服务提供商、配电提供商、负荷服务实体、发电机运营商和购销实体将被删除，因为这些实体将从要求中引用的负责实体收到有关限制的指示。注:推导的限度取代了溶胶的清晰度和特异性。SOLs包括电压、稳定性和热极限，因此是最大的限制因素。

## Rationale for Requirements R19 and R20 (R19, R20, R22, and R23 in TOP-001-4):

## 要求R19和R20的基本原理(R19, R20, R22和R23在TOP-001-4):

Added for consistency with proposed IRO-002-4, Requirement R1. Data exchange capabilities are required to support the data specification concept in proposed TOP-003-3.

增加了与拟议的IRO-002-4，要求R1的一致性。为了支持TOP-003-3中提出的数据规范概念，需要数据交换能力。

The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

拟议的修改地址指示冗余和不同的路由数据交换能力(FERC第817号命令第47段)。

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, 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.

冗余和多样化数据交换路由功能包括数据交换基础设施组件(如交换机、路由器、服务器、电源、网络布线和这些组件之间的通信路径的主要控制中心的交换系统运行数据)将提供持续的功能,尽管失败或单个组件的故障传播算子的主控制中心(上)。冗余和多种路由的数据交换功能防止了主控制中心数据交换基础设施中的单点故障，从而阻止了实时数据流的中断。要求R20不要求数据交换的自动或瞬时故障转移能力。根据TOP的主控制中心内的基础设施或硬件的安排，可以通过各种方式实现不稳定和不同的路由。

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

冗余的可靠性目标是在中断、维护或测试数据交换基础设施期间提供持续的数据交换功能。对于个别数据交换组件的计划或非计划中断期间，建议的需求不需要额外的冗余数据交换基础设施组件，仅仅是为了提供冗余。

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

建议的需求不涉及不在TOP主控制中心内的基础设施。

## Rationale for Requirement R21: 要求R21的基本原理：

The proposed requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

拟议要求涉及主要控制中心所用数据交换能力测试指令（联邦能源监管委员会第817号命令第51段）。

## A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). 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.

冗余功能测试表明，尽管单个组件（如交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径，用于交换系统操作数据）。随着时间的推移，实体的测试实践应该检查其数据交换功能的各种故障模式。当一个实际的事件成功地执行了冗余功能时，它可以被认为是一个测试，用于提出的需求。

## Rationale for Requirements R22 and R23: 要求R22和R23的基本原理：

The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

拟议的修改涉及数据交换能力的冗余和多样化路由指令（联邦能源监管委员会第817号命令第47段）。

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, 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.

冗余和不同路由的数据交换功能由数据交换基础设施组件组成（例如，交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径（用于交换系统操作数据），即使平衡机构（BA）主控制中心中的单个组件出现故障或故障，也能提供持续的功能。冗余和不同路由的数据交换功能可防止主控制中心数据交换基础设施中的单点故障中断实时数据流。要求R23不要求数据交换功能的自动或瞬时故障转移。根据平衡机构的主要控制中心内的基础设施或硬件的安排，可以通过各种方式实现不稳定和不同的路由。

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

冗余的可靠性目标是在数据交换基础设施的中断、维护或测试期间提供持续的数据交换功能。对于单个数据交换组件的计划内或计划外停机期间，拟议的要求不需要额外的冗余数据交换基础设施组件来提供冗余。

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

建议的要求没有涉及平衡机构主要控制中心之外的基础设施。

## Rationale for Requirement R24: 要求R24的基本原理：

The proposed requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

拟议要求涉及主要控制中心所用数据交换能力测试指令（联邦能源监管委员会第817号命令第51段）。

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component(e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). 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.

冗余功能测试表明，尽管单个组件（如交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径，用于交换系统操作数据）。随着时间的推移，实体的测试实践应该检查其数据交换功能的各种故障模式。当一个实际的事件成功地执行了冗余功能时，它可以被认为是一个测试，用于提出的需求。

# Introduction A.介绍

* 1. **Title:** Transmission Operations **标题：输电运营**
  2. **Number:** TOP-001-5 **编号：** TOP-001-5
  3. **Purpose:** To prevent instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Interconnection by ensuring prompt action to prevent or mitigate such occurrences.

**目的:** 通过确保及时的操作以防止或减轻不稳定,不受控制的分离,或级联 故障,严重影响互连的可靠性等此类事件。

## Applicability: 4. 适用范围:

* + 1. **Functional Entities: 4.1功能性实体**
       1. Balancing Authority **4.1.1** 平衡机构
       2. Transmission Operator **4.1.2**  输电运营商
       3. Generator Operator **4.1.3** 发电机运营商
       4. Distribution Provider **4.1.4** 配电供应商
  1. **Effective Date:** See Implementation Plan **5.生效日期：** 见实施计划

# Requirements and Measures B.要求与措施

**R1.** Each Transmission Operator shall act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions. *[Violation Risk Factor: High][Time Horizon: Same-Day Operations, Real-time Operations]*

**R1.** 每个输电运营商应通过自己的行动或发布操作指令来维持其输电运营商区域的可靠性。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M1.** 每个输电运营商应拥有并提供证据，这些证据可能包括但不限于日期的运营商日志、日期记录、日期和时间戳的录音或日期的录音誊本、电子通信或同等文件，用于确定其通过自己的行动或发布操作指令来维持其输电运营商区域的可靠性。

**R2.** Each Balancing Authority shall act to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions. *[Violation Risk Factor: High][Time Horizon: Same-Day Operations, Real-time Operations]*

**R2.** 每一个平衡机构应通过其自身的行动或发布操作指示来维持其平衡机构区域的可靠性。*(违反风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M2.** 每个平衡机构应拥有并提供证据，可能包括但不限于过去时期的操作员日志、日期记录、日期和时间戳的录音或日期的录音誊本、电子通信或同等文件，用于确定其通过自己的行动或发布操作指令来维持其平衡机构区域的可靠性。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R3.** 每个平衡机构、发电机运营商和配电供应商应遵守其输电运营商发出的每个操作指令，除非该操作无法实际执行，或违反安全、设备、监管或法律要求。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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, and Distribution Provider 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, or Distribution Provider may provide an attestation.

**M3.** 各平衡机构、发电机运营商和配电供应商应根据要求提供证据，证明其遵守了输电运营商发出的每个操作指令，除非该操作无法实际执行，或违反了安全、设备、监管或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。在这种情况下，平衡主管部门、发电机运营商和配电供应商应拥有并提供安全、设备、监管或法定要求的副本，作为不遵守输电运营商操作指令的证据。如果没有发生这种情况，平衡机构、发电机运营商或配电供应商可提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R4.** 各平衡机构、发电机运营商和配电供应商应告知其输电运营商其无法遵守其输电运营商发出的操作指令。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M4**. 各平衡机构、发电机运营商和配电供应商应根据要求提供证据，这些证据可能包括但不限于过去时期的运营商日志、录音或录音誊本、电子通信或电子或纸质格式的同等证据，说明其告知其输电运营商其无法遵守其发出的操作指令。如果这种情况并没有发生,平衡权威,发电机运营商或配电供应商可提供一个可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-Time Operations]*

**R5.** 每个输电运营商、发电机运营商和配电供应商都应遵守其平衡机构发出的每个操作指令，除非该操作无法实际执行，或违反安全、设备、法规或法律要求。*(违规风险因素:高)(时间:当天操作,实时操作)*

**M5.** Each Transmission Operator, Generator Operator, and Distribution Provider shall make available upon request, evidence that it complied with each Operating Instruction issued by its Balancing Authority 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.

**M5.** 每个输电运营商、发电机运营商和配电供应商应根据要求提供证据，证明其遵守了其平衡机构发出的每个操作指令，除非该操作无法实际执行，或违反了安全、设备、监管或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。在这种情况下，输电运营商、发电机运营商和配电提供商应拥有并提供安全、设备、法规或法定要求的副本，作为不遵守平衡机构操作指令的证据。未发生上述情形的，由输电运营商、发电运营商或配电运营商提供可信证明。

**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 its Balancing Authority. *[Violation Risk Factor: High] [Time Horizon: Same- Day Operations, Real-Time Operations]*

**R6.** 每个输电运营商、发电机运营商和配电供应商应告知其平衡机构其无法遵守其平衡机构发出的操作指令。*(违规风险因素:高)(时间范围:当日操作，实时操作)*

**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.

**M6.** 每个输电运营商、发电机运营商和配电供应商应根据要求提供证据，这些证据可能包括但不限于过去时期的运营商日志、录音或录音誊本、电子通信或电子或纸质格式的同等证据，说明其已告知平衡机构其无法遵守其操作指令。未发生上述情形的，由输电运营商、发电运营商或配电供应商提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R7.** 每个输电运营商应在其可靠性协调区域内协助其他输电运营商，前提是提出请求的输电运营商已经实施了类似的应急程序，除非这种协助无法实际实施，或会违反安全、设备、监管或法律要求。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M7.** 每个输电运营商应根据要求提供相关证据，证明在其可靠性协调区域内，已向其他输电运营商提供类似要求的协助，除非此类协助无法实际实施，或违反了安全、设备、法规或法律要求。此类证据可以包括但不限于过去时期的操作员日志、语音记录或语音记录的文本、电子通信或其他电子或硬拷贝格式的同等证据。如果没有收到援助请求，输电运营商可提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-Time Operations]*

**R8.** 每个输电运营商应将其实际或预期的导致或可能导致紧急情况的操作通知其可靠性协调员、已知受影响的平衡机构和已知受影响的输电运营商。*(违规风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M8.** 每个输电运营商应根据要求提供证据，证明其已将导致或可能导致紧急情况的实际或预期操作通知其可靠性协调员、已知受影响的平衡机构和已知受影响的输电运营商。证据可包括但不限于注明日期的操作员日志、语音记录或语音记录的抄本、电子通信或其他等效证据。未发生上述情形的，配电运营商可以提供可信证明。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning, Same-Day Operations, Real-Time Operations]*

**R9.** 对于遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信通道，每个平衡机构和输电运营商应将所有计划中断和30分钟以上的计划外中断通知其可靠性协调员和已知受影响的互联实体。*(违规风险因素:中等)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M9.** 每个平衡机构和输电运营商应提供证据，证明其已向其可靠性协调员和已知受影响的互联实体通报了所有计划中断，以及30分钟或以上的计划外中断，用于遥测和控制设备、监测和评估能力以及相关的通信通道。证据可包括但不限于注明日期的操作员日志、语音记录或语音记录的抄本、电子通信或其他等效证据。如果这种情况并没有发生,平衡机构或输电运营商可提供一个可信证明。

**R10.** Each Transmission Operator shall perform the following for determining System Operating Limit (SOL) exceedances within its Transmission Operator Area: *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R10.** 每个输电运营商应执行以下操作，以确定其输电运营商区域内的系统运行限值(SOL)超过:(*违规风险因素:高)(时间范围:实时运行)*

* 1. Monitor Facilities within its Transmission Operator Area;

**10.1.**  监控其输电运营商区域内的设施;

* 1. Monitor the status of Remedial Action Schemes within its Transmission Operator Area;

**10.2.** 监察其输电运营商范围内补救行动计划的状况;

* 1. Monitor non-BES facilities within its Transmission Operator Area identified as necessary by the Transmission Operator;

**10.3.** 根据输电运营商的需要，监控其输电运营商区域内的非BES设施;

* 1. Obtain and utilize status, voltages, and flow data for Facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator;

**10.4.** 获取和使用输电运营商认为必要的其输电运营商区域以外设施的状 态、电压和流量数据;

* 1. Obtain and utilize the status of Remedial Action Schemes outside its Transmission Operator Area identified as necessary by the Transmission Operator; and

**10.5.** 获取和利用输电运营商认为必要的输电运营商区域以外的补救行动 方案的状态;

* 1. Obtain and utilize status, voltages, and flow data for non-BES facilities outside its Transmission Operator Area identified as necessary by the Transmission Operator.

**10.6.** 根据输电运营商的要求，获取并利用其输电运营商区域以外的非BES设备 的状态、电压和流量数据。

**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.

**M10.** 每个输电运营商应拥有并根据要求提供证据，包括但不限于能源管理系统描述文件、计算机打印输出、监控和数据采集(SCADA)数据收集或其他同等证据，用于确认其监控或获取和利用数据，以确定其输电运营商区域内任何系统运行限制(SOL)的超出。

**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 generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

**R11.** 每个平衡机构应监测其平衡管辖区域，包括影响发电或负载的补救行动计划的状态，以在其平衡管辖区域内维持发电-负载交换平衡，并支持互连频率。*(违反风险因素:高)(时间范围:实时操作)*

**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 generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.

**M11.** 每个平衡机构为了在其均衡权限范围内保持发电负载交换平衡，支持互连频率应具有并应要求提供证据，可包括但不限于能源管理系统描述文件、计算机打印件、SCADA数据收集，或用于确认其监控平衡权领域的其他等效证据，包括影响发电或负荷的补救行动计划的状态。

**R12.** Each Transmission Operator shall not operate outside any identified Interconnection Reliability Operating Limit (IROL) for a continuous duration exceeding its associated IROL Tv. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R12.** 每个输电运营商不得在超过其相关联的IROL Tv的持续时间内超出任何已识别的互连可靠性运行限制(IROL)。*(违反风险因素:高)(时间范围:实时操作)*

**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 Tv. 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.

**M12.** 每个输电运营商应提供证据，表明其在任何已识别的互联可靠性运行限制(IROL)之外运行的任何情况下，持续时间不超过其关联的IROL Tv。这些证据可包括但不限于注明日期、时间、持续时间和功率骤增细节的电子或硬拷贝格式的注明日期的计算机日志或报告。如果尚未发生此类情况，输电运营商可以提供未发生事件的可信证明。

**R13.** Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R13.** 每个输电运营商应确保至少每30分钟进行一次实时评估。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M13.** 每个输电运营商应拥有并应要求提供证据，以证明其确保至少每30分钟进行一次实时评估。该证据可以包括但不限于显示评估执行时间的计算机日志、日期清单或其他证据。

**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. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R14.** 每个输电运营商应启动其操作计划，以减轻作为实时监测或实时评估一部分的SOL超标。*(违反风险因素:高)(时间范围:实时操作)*

**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.

**M14.** 每个输电运营商应有证据表明，它启动了其操作计划，以减轻SOL超标，这是其实时监测或实时评估的一部分。这一证据可以包括但不限于显示操作计划启动时间的日期的计算机日志、日期清单或其他证据。

**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. *[Violation Risk Factor: Medium] [Time Horizon: Real-Time Operations]*

**R15.** 当超过SOL时，每个输电运营商应通知其可靠性协调人员为使系统恢复到一定范围所采取的行动。*(违反风险因素:中等)(时间范围:实时操作)*

**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.

**M15.** 每个输电运营商应提供证据，表明当超出SOL值时，其通知其可靠性协调程序已采取措施使系统恢复到限制范围内。这些证据可以包括但不限于注明日期的操作员日志、语音记录或语音记录的转录本、或注明日期的计算机打印输出。未发生上述情形的，输电运营商可以提供可信证明。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R16.** 每个输电运营商应向其系统运营商提供批准其遥测和控制设备的计划停机和维护、监控和评估能力以及受影响实体之间的相关通信信道的权限。(*违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M16.** 每个输电运营商应拥有并应要求提供证据，包括但不限于文件化程序或同等证据，用于确认输电运营商已向其系统运营商提供授权，以批准计划中断和远程测量和控制设备的维护、监测和评估能力，以及受影响实体之间的相关通信渠道。

**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. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R17.** 每个平衡机构应向其系统操作员提供授权，以批准计划中的中断和对其遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信通道的维护。*(违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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.

**M17.** 每个平衡机构应拥有并应要求提供证据，包括但不限于文件化程序或同等证据，用于确认平衡机构已向其系统操作人员提供了批准计划中断和对其遥测和控制设备、监测和评估能力以及受影响实体之间相关通信渠道的权限。

**R18.** Each Transmission Operator shall operate to the most limiting parameter in instances where there is a difference in SOLs. [*Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R18.** 在SOLs存在差异时，每个输电运营商都应以最大的限制参数进行操作。*(违反风险因素:高)(时间范围:业务规划,当天操作,实时操作)*

**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 ost limiting parameter in instances where there is a difference in SOLs.

**M18.** 每个输电运营商应拥有并根据要求提供证据，包括但不限于运营商日志、语音记录、电子通信或同等证据，用于确定在SOLs差异的情况下，其操作是否达到ost限制参数。

**R19.** Reserved

**R19.** 保留

**M19.** Reserved

**M19.** 保留

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

**R20.**  每个输电运营商应具备数据交换能力，并在其主要控制中心内建立冗余和多种路由的数据交换基础设施，以便与其可靠性协调机构、平衡机构和其确定需要数据的实体进行实时数据交换，以便进行实时监控和实时评估。*(违反风险因素:高)(时间:当天操作,实时操作)*

**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.

**M20.** 每个输电运营商应根据要求提供证据，包括但不限于系统规范、系统图或其他列出其数据交换能力的文件，包括输电运营商主要控制中心内冗余和分散路由的数据交换基础设施，以便与其可靠性协调器、平衡机构进行实时数据交换，它所确定的实体需要数据，以便按照要求进行实时监测和实时评估。

**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. *[Violation Risk Factor: Medium ] [Time Horizon: Operations Planning]*

**R21.** 每个输电运营商应至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换能力的冗余功能。如果测试失败，输电运营商应在两小时内采取行动恢复冗余功能。*(违反风险因素:中等)(时间范围:行动计划)*

**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 the 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.

**M21.** 每个输电运营商应拥有并应要求提供证据，证明其测试了要求R20中规定的冗余功能的主要控制中心数据交换功能，或经历了证明冗余功能的事件;并且，如果测试不成功，在两个小时内启动操作，以恢复需求R21中指定的冗余功能。证据可以包括但不限于:有日期和时间戳的测试记录、操作员日志、语音记录或电子通信。

**R22.** Reserved

**R22.** 保留

**M22.** Reserved

**M22.** 保留

**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. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

**R23.** 每个平衡机构应具备数据交换能力，在平衡机构的主要控制中心内设置冗余的、路由多样的数据交换基础设施，以便与其可靠性协调者、输电运营商以及确定需要数据的实体进行实时数据交换，以实现其实时监控和分析功能。*(违反风险因素:高)(时间:当天操作,实时操作)*

**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.

M23. 每个平衡机构应具备并应请求提供证据，可包括但不限于系统规范、系统图或列出其数据交换能力的其他文件，包括平衡权主要控制中心内冗余和分散路由的数据交换基础设施，用于与其可靠性协调员、输电运营商交换实时数据，为了执行需求中指定的实时监控和分析功能，它所识别的实体需要从中获取数据。

**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. *[Violation Risk Factor: Medium ] [Time Horizon: Operations Planning]*

**R24.** 每个平衡机构应至少每90个日历天测试一次要求R23中规定的主要控制中心数据交换能力的冗余功能。如果测试不成功，平衡机构将在两小时内启动操作来恢复冗余功能。*(违反风险因素:中等)(时间范围:行动计划)*

**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.

**M24.** 每个平衡机构应拥有并应要求提供证据，证明其对需求R23中规定的冗余功能的主要控制中心数据交换能力进行了测试，或经历了证明冗余功能的事件;并且，如果测试不成功，在两个小时内启动操作，以恢复需求R24中指定的冗余功能。证据可以包括但不限于:有日期和时间戳的测试记录、操作员日志、语音记录或电子通信。

# C.Compliance C.合规手段

## Compliance Monitoring Process: 1.合规监控过程:

* + 1. **Compliance Enforcement Authority:**

“Compliance Enforcement Authority” means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

* 1. **合规执法机构:**

“合规执行机构”系指NERC或区域实体，或由适用的政府机构指定的任何实体，在各自的管辖范围内各自履行监督和/或强制执行可靠性标准的职责。

## Evidence Retention: 1.2. 保留证据:

The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

以下证据保留期限指实体被要求保留特定证据以证明合规的期限。如果以下规定的证据保留期比上次审计后的时间短，合规执行机构可以要求实体提供其他证据，以证明其在上次审计后的全职期间是合规的。

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

适用实体应保存数据或证据，以证明符合下述规定，除非其合规执行机构指示将特定证据保留较长时间，作为调查的一部分。

* Each Balancing Authority, Transmission Operator, Generator Operator, and Distribution Provider shall each keep data or evidence for each applicable Requirement R1 through R11, and Measure M1 through M11, for the current calendar year and one previous calendar year, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
* 各平衡机构、输电运营商、发电机运营商和配电供应商应各自保存当前日历年和之前一年适用要求R1至R11以及检测M1至M11的数据或证据，且应保留至少90公历日的运营商日志和语音记录除外，除非遵约执法部门指示将特定证据保留更长的时间，作为调查的一部分。
* Each Transmission Operator shall retain evidence for three calendar years of any occasion in which it has exceeded an identified IROL and its associated IROL Tv as specified in Requirement R12 and Measure M12.
* 每个输电运营商应在超过R12和M12要求中规定的已识别的IROL及其相关的IROL Tv的任何情况下保留三个公历年的证据。
* Each Transmission Operator shall keep data or evidence for Requirement R13 and Measure M13 for a rolling 30-day period, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
* 每个输电运营商应保存滚动的30天内的要求R13和检测M13的数据或证据,除非由其合规执法机构保留更长一段时间的具体证据,作为调查的一部分。
* Each Transmission Operator shall retain evidence and that it initiated its Operating Plan to mitigate a SOL exceedance as specified in Requirement R14 and Measurement M14 for three calendar years.
* 每个输电运营商应保留其启动其运营计划以在三个公历年内减轻R14和M14中规定的SOL超过的情况的证据。
* Each Transmission Operator and Balancing Authority shall each keep data or evidence for each applicable Requirement R15 through R19, and Measure M15 through M19 for the current calendar year and one previous calendar year, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个输电运营商和平衡机构应各自保存每个适用要求R15至R19的数据或证据，并对当前公历年和之前的一个公历年检测M15至M19，但操作员日志和语音记录除外，该记录应至少保留90个公历日。
* Each Transmission Operator shall keep data or evidence for Requirement R20 and Measure M20 for the current calendar year and one previous calendar year.
* 每个输电运营商应保存适用于当前公历年和之前的一个公历年的要求R20和检测M20的数据或证据。
* Each Transmission Operator shall keep evidence for Requirement R21 and Measure M21 for the most recent twelve calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个输电运营商要保留最近12个公历月的R21和检测M21证据,但操作日志和语音记录除外，它们应保留至少90个公历日。
* Each Balancing Authority shall keep data or evidence for Requirement R22 and Measure M22 for the current calendar year and one previous calendar year,

with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.

每个平衡机构应保存当前公历年和之前的一个公历年要求R22和检测M22的数据或证据，但操作员日志和语音记录除外，它们应至少保留90个公历日。

* Each Balancing Authority shall keep data or evidence for Requirement R23 and Measure M23 for the current calendar year and one previous calendar year.
* 每个平衡机构应保存当前公历年和之前的一个公历年要求R23的和检测M23数据或证据。
* Each Balancing Authority shall keep evidence for Requirement R24 and Measure M24 for the most recent twelve calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
* 每个平衡机构应保存最近12个日历月要求R24和检测M24的证据，但操作员日志和语音记录应至少保留90个日历天。

## 1.3. Compliance Monitoring and Enforcement Program

## 1.3. 合规性监视和执行程序

As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

按照NERC程序规则的定义，“合规性监测和执行计划”指的是将用于评估数据或信息的过程的识别，以评估相关可靠性标准的性能或结果。

# Violation Severity Levels

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| **R #** | **Violation Severity Levels违反严重性级别** | | | | |
| **Lower VSL**  **低违规级别** | | **Moderate VSL**  **中等违规级别** | **High VSL高违规级别** | **Severe VSL**  **严重违规级别** |
| **R1.** | N/A | N/A | | N/A | The Transmission Operator failed to act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions.  输电运营商未能通过自己的行动或发布操作指令来维持其输电运营商区域的可靠性。 |
| **R2.** | N/A | N/A | | N/A | The Balancing Authority failed to act to maintain the reliability of its Balancing Authority Area via its own actions or by issuing Operating Instructions.  平衡机构未能通过自己的行动或发布操作指示来维持其平衡机构区域的可靠性。 |
| **R3.** | N/A | N/A | | N/A | The responsible entity did not comply with an Operating Instruction issued by the Transmission Operator, and such action could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  负责任的实体没有遵守输电运营商发出的操作指令，这种行为本可以实际执行，不会违反安全、设备、监管或法律要求。 |
| **R4.** | N/A | N/A | | N/A | The responsible entity did not inform its Transmission Operator of its inability to  comply with an Operating Instruction issued by its Transmission Operator.  负责单位未告知其输电运营商其未能遵守其输电运营商发出的操作指示。 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R5** | N/A | N/A | N/A | The responsible entity did not comply with an Operating Instruction issued by the Balancing Authority, and such action could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  负责的实体不遵守平衡机构发出的作业指导书，而这种行动本可以实际执行，不会违反安全、设备、监管或法定要求。 |
| **R6** | N/A | N/A | N/A | The responsible entity did not inform its Balancing Authority of its inability to comply with an Operating Instruction issued by its Balancing Authority.  负责实体没有通知其平衡机构它没有能力遵守其平衡机构发出的操作指示。 |
| **R7** | N/A | N/A | N/A | The Transmission Operator did not provide comparable assistance to other Transmission Operators within its Reliability Coordinator Area, when requested and able, and the requesting entity had implemented its Emergency procedures, and such actions could have been physically implemented and would not have violated safety, equipment, regulatory, or statutory requirements.  在接到请求时，输电运营商没有向其可靠性协调区域内的其他输电运营商提供相当的的援助，而且请求实体已经执行了紧急程序，且这种行动可以实际执行，不会违反安全、设备、监管或法律要求。 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R8** | The Transmission Operator did not inform one known impacted Transmission Operator or 5% or less of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商没有将其实际操作或预期操作导致或可能导致相关输电运营商区域发生紧急情况的情况告知一个已知受影响的输电运营商或5%或以下已知受影响的输电运营商(以两者中较大者为准)。  OR,  The Transmission Operator did not inform one known impacted Balancing Authorities or 5% or less of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相应的平衡管理区域发生紧急情况)通知某一已知受影响的平衡管理机构或5%或以下已知受影响的平衡管理机构(以两者中较大的一个为准)。 | The Transmission Operator did not inform two known impacted Transmission Operators or more than 5% and less than or equal to 10% of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商未向两个已知受影响的输电运营商(或大于5%、小于或等于10%的已知受影响输电运营商)通报其实际操作或预期操作导致或可能导致相关输电运营商区域发生紧急情况的情况。  OR,  The Transmission Operator did not inform two known impacted Balancing Authorities or more than 5% and less than or equal to 10% of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相关平衡管理区域发生紧急情况)通知两个已知受影响平衡管理机构或大于5%且小于或等于已知受影响平衡管理机构(以两者中较大的一个为准)。 | The Transmission Operator did not inform three known impacted Transmission Operators or more than 10% and less than or equal to 15% of the known impacted Transmission Operators, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Transmission Operator Areas.  输电运营商没有向三个已知受影响的输电运营商或超过10%、小于或等于15%的已知受影响的输电运营商(以两者中较大者为准)通报其实际或预期的导致或可能导致相关输电运营商区域发生紧急情况的操作。  OR,  The Transmission Operator did not inform three known impacted Balancing Authorities or more than 10% and less than or equal to 15% of the known impacted Balancing Authorities, whichever is greater, of its actual or expected operations that resulted in, or could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商未将其实际或预期的操作(导致或可能导致相关平衡管理区域发生紧急情况)通知三个已知受影响平衡管理机构或大于10%且小于或等于已知受影响平衡管理机构的15%(以两者中较大的一个为准)。 | The Transmission Operator did not inform its Reliability Coordinator of its actual or expected operations that resulted in, or could have resulted in, an Emergency on those respective Transmission Operator Areas.  输电运营商没有将其实际或预期的操作导致或可能导致相关输电运营商区域发生紧急情况的情况通知其可靠性协调员。  OR  The Transmission Operator did not inform four or more known impacted Transmission Operators or more than 15% of the known impacted Transmission Operators of its actual or expected operations that resulted in, or could have resulted in, an Emergency on those respective Transmission Operator Areas.  或者，  输电运营商没有通知4个或4个以上已知受影响的输电运营商或超过15%已知受影响的输电运营商，其实际或预期的操作导致或可能导致在这些各自的输电运营商区域发生紧急情况。  OR,  The Transmission Operator did not inform four or more known impacted Balancing Authorities or more than 15% of the known impacted Balancing Authorities of its actual or expected operations that resulted in, or  could have resulted in, an Emergency on respective Balancing Authority Areas.  或者，  输电运营商没有向四个或四个以上的已知受影响平衡机构或超过15%的已知受影响平衡机构通报其实际或预期的导致或可能导致相应平衡机构区域发生紧急情况的操作。 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R9** | The responsible entity did not notify one known impacted interconnected entity or 5% or less of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未向一个已知受影响的互联实体或已知受影响实体的5%或以下(以两者中较大者为准)通知计划中断，或30分钟或更长时间的计划外中断。 | The responsible entity did not notify two known impacted interconnected entities or more than 5% and less than or equal to 10% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未将计划中断或30分钟以上的计划外中断通知两个已知受影响相互关联的实体，或大于5%、小于或等于10%的已知受影响实体(以两者中较大者为准)。 | The responsible entity did not notify three known impacted interconnected entities or more than 10% and less than or equal to 15% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体未通知三个已知受影响相互关联的实体或超过10%、小于或等于15%已知受影响实体(以两者中较大者为准)的计划中断，或30分钟或以上的计划外中断。 | The responsible entity did not notify its Reliability Coordinator of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels.  对于遥测和控制设备、监视和评估能力以及相关通信通道的计划停机或30分钟以上的计划外停机，责任实体未通知其可靠性协调器。  OR,  The responsible entity did not notify four or more known impacted interconnected entities or more than 15% of the known impacted entities, whichever is greater, of a planned outage, or an unplanned outage of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between the affected entities.  或者，  对于遥测和控制设备、监测和评估能力，或受影响实体之间的关联通信渠道，责任实体没有通知四个或四个以上已知受影响相互关联的实体或15%以上已知受影响实体(以较大的实体为准)的计划中断，或30分钟或更长时间的计划外中断。 |
| **R10** | The Transmission Operator did not monitor, obtain, or utilize one of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6.  输电运营商未监控、获取或使用输电运营商要求或确定的且在要求R10第10.1至10.6部分中列出的项目之一。 | The Transmission Operator did not monitor, obtain, or utilize two of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6  输电运营商没有监控、获取或利用输电运营商所要求的或确定的、列于需求R10第10.1至10.6部分的两个项目 | The Transmission Operator did not monitor, obtain, or utilize three of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10, Part 10.1 through 10.6.  输电运营商没有监控、获取或利用要求R10 第10.1至10.6部分中列出的输电运营商所要求或确定的必要物品中的三种。 | The Transmission Operator did not monitor, obtain, or utilize four or more of the items required or identified as necessary by the Transmission Operator and listed in Requirement R10 Part 10.1 through 10.6.  输电运营商未监控、获取或利用要求R10第10.1至10.6部分中所列的输电运营商所要求或确定的四种或四种以上的必要物品。 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R11** | N/A | N/A | The Balancing Authority did not monitor the status of Remedial Action Schemes that impact generation or Load, in order to maintain generation-Load- interchange balance within its Balancing Authority Area and support Interconnection frequency.  平衡机构没有监测影响发电或负载的补救行动方案的状态，以便在其平衡机构范围内维持发电-负载-交换平衡并支持互连频率。 | The Balancing Authority did not monitor its Balancing Authority Area, in order to maintain generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.  平衡机构没有监控其平衡机构区域，以维护其平衡机构区域内的生成负载-交换平衡并支持互连频率。 |
| **R12** | N/A | N/A | N/A | The Transmission Operator exceeded an identified Interconnection Reliability Operating Limit (IROL) for a continuous duration greater than its associated IROL Tv.  输电运营商在持续时间大于其相关IROL Tv的情况下，超过了确定的互连可靠性操作限制(IROL)。 |
| **R13** | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for one 30- minute period within that 24-hour period.  对于30天保留期内的24小时内的任何样本，输电运营商的实时评估没有在24小时内进行30分钟的评估。 | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for two 30-minute periods within that 24-hour period.  在30天保留期内的任何24小时样本，在该24小时期内的两个30分钟内，输电运营商都没有进行实时评估。 | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for three 30- minute periods within that 24- hour period.  对于30天保留期内的任何24小时样本，输电运营商没有在24小时内进行3次30分钟的实时评估。 | For any sample 24-hour period within the 30-day retention period, the Transmission Operator’s Real-time Assessment was not conducted for four or more 30-minute periods within that 24-hour period.  对于30天保留期内的任何24小时样本，输电运营商不会在该24小时内进行4次或更多次30分钟的实时评估。 |
| **R14.** | N/A | N/A | N/A | The Transmission Operator did not initiate its Operating Plan for mitigating a SOL exceedance identified as part of its Real- time monitoring or Real-time Assessment  在实时监测或实时评估中，输电运营商并没有启动降低SOL超标的作业计划 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R15.** | N/A | N/A | N/A | The Transmission Operator did not inform its Reliability Coordinator of actions taken to return the System to within limits when a SOL had been exceeded.  当超出SOL时，输电运营商没有通知其可靠性协调器将系统返回到限制范围内所采取的行动。 |
| **R16.** | N/A | N/A | N/A | The Transmission Operator did not 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.  输电运营商没有向其系统运营商提供授权，以批准计划中的停机和维护其遥测和控制设备、监视和评估能力，以及受影响实体之间的相关通信通道。 |
| **R17.** | N/A | N/A | N/A | The Balancing Authority did not provide its System Operators with the |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
|  |  |  |  | authority to approve planned outages and maintenance of its telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels between affected entities.  平衡机构没有向其系统运营商提供权力，以核准计划中的中断和维修其遥测和控制设备、监测和评估能力以及受影响实体之间的相关通信渠道。 |
| **R18** | N/A | N/A | N/A | The Transmission Operator failed to operate to the most limiting parameter in instances where there was a difference in SOLs.  在SOLs存在差异的情况下，输电运营商不能操作到最极限的参数。 |
| **R19.**  Reserved.  保留 |  |  |  |  |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R20** | N/A | N/A | The Transmission Operator had data exchange capabilities with its Reliability Coordinator, Balancing Authority, and identified entities for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Transmission Operator's primary Control Center, as specified in the Requirement.  输电运营商具有数据交换能力，其可靠性协调器、平衡机构和用于执行实时监控和实时评估的识别实体，但在输电运营商的主要控制中心内没有需求中指定的冗余和不同路由的数据交换基础设施。 | The Transmission Operator did not have data exchange capabilities with its Reliability Coordinator, Balancing Authority, and identified entities for performing Real-time monitoring and Real-time Assessments as specified in the Requirement.  输电运营商不具备数据交换能力，不具备可靠性协调器、平衡机构，也不具备执行需求中指定的实时监控和实时评估的实体。 |
| **R21.** | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test;  输电运营商测试了需求R20中为冗余功能指定的主要控制中心数据交换能力，但自上次测试以来，测试时间超过90个日历天，但少于或等于120个日历天;  OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来已经进行了超过120个日历天但小于或等于150个日历天的测试;  OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过150个日历天，但小于或等于180个日历天;  OR  The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality, but did so more than 180 calendar days since the previous test;  输电运营商测试了要求R20中规定的主要控制中心数据交换功能的冗余功能，但自上次测试以来已经进行了超过180个日历天;  OR  The Transmission Operator did not test its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality;  或者，  输电运营商没有测试要求R20中规定的主要控制中心数据交换功能的冗余功能;  OR |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
|  | but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过2小时和小于或等于4小时的时间内启动恢复冗余功能的操作。 | redundant functionality in more than 4 hours and less than or equal to 6 hours.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过4小时且小于或等于6小时的时间内启动恢复冗余功能的操作。 | redundant functionality in more than 6 hours and less than or equal to 8 hours.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在超过6小时且小于或等于8小时的时间内启动恢复冗余功能的操作。 | The Transmission Operator tested its primary Control Center data exchange capabilities specified in Requirement R20 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.  或者，  输电运营商至少每90个日历天测试一次要求R20中规定的主要控制中心数据交换功能的冗余功能，但在测试失败后，在8小时内没有采取行动恢复冗余功能。 |
| **R22.**  Reserved.  保留 |  |  |  |  |
| **R23** | N/A | N/A | The Balancing Authority had data exchange capabilities with its Reliability Coordinator, Transmission Operator, and identified entities for performing Real-time monitoring and analysis functions, but did not have redundant and diversely routed data exchange infrastructure within the Balancing Authority's primary Control Center, as specified in the Requirement.  平衡机构与其可靠性协调员、输电运营商以及用于执行实时监视和分析功能的已识别实体具有数据交换功能，但在平衡机构的主要控制中心内没有冗余和分散路由的数据交换基础设施(如需求中所述)。 | The Balancing Authority did not have data exchange capabilities with its Reliability Coordinator, Transmission Operator, and identified entities for performing Real-time monitoring and analysis functions as specified in the Requirement.  平衡机构没有与可靠性协调员、输电运营商和标识的实体进行数据交换的能力，以执行需求中指定的实时监视和分析功能。 |

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| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R24** | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but  did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能，以确定冗余功能，但是自上次测试以来超过90个日历天但小于或等于120个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过2小时且小于或等于4小时内恢复冗余功能的操作。 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 120 calendar  days but less than or equal to 150 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了120个日历天，但小于或等于150个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过4小时且小于或等于6小时内恢复冗余功能的操作 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了150个日历天，但小于或等于180个日历天;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，启动了在超过6小时且小于或等于8小时内恢复冗余功能的操作 | The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality, but did so more than 180 calendar days since the previous test;  平衡机构测试了需求R23中指定的主要控制中心数据交换功能的冗余功能，但自上次测试以来，测试时间超过了180个日历天  OR  The Balancing Authority did not test its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality;  或者，  平衡机构没有测试其在需求R23中为冗余功能指定的主要控制中心数据交换能力;  OR  The Balancing Authority tested its primary Control Center data exchange capabilities specified in Requirement R23 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.  或者，  对于冗余功能，平衡机构至少每90个日历天测试一次需求R23中规定的主要控制中心数据交换能力，但在一次不成功的测试之后，没有在8小时内恢复冗余功能的操作 |

**D.Regional Variances C.区域变化**

None. 无

# E.Associated Documents

The Project 2014-03 SDT has created the SOL Exceedance White Paper as guidance on SOL issues and the URL for that document is: [http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx.](http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx)

项目2014-03 SDT已经创建了SOL超越数白皮书作为SOL问题的指导，该文件的网址是:

[http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx.](http://www.nerc.com/pa/stand/Pages/TOP0013RI.aspx)

Operating Plan - An Operating Plan includes general Operating Processes and specific Operating Procedures. It may be an overview document which provides a prescription for an Operating Plan for the next-day, or it may be a specific plan to address a specific SOL or IROL exceedance identified in the Operational Planning Analysis (OPA). Consistent with the NERC definition, Operating Plans can be general in nature, or they can be specific plans to address specific reliability issues. The use of the term Operating Plan in the revised TOP/IRO standards allows room for both. An Operating Plan references processes and procedures, including electronic data exchange, which are available to the System Operator on a daily basis to allow the operator to reliably address conditions which may arise throughout the day. It is valid for tomorrow, the day after, and the day after that. Operating Plans should be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an OPA or a Real-time Assessment (RTA). As the definition in the Glossary of Terms states, a restoration plan is an example of an Operating Plan. It contains all the overarching principles that the System Operator needs to work his/her way through the restoration process. It is not a specific document written for a specific blackout scenario but rather a collection of tools consisting of processes, procedures, and automated software systems that are available to the operator to use in restoring the system. An Operating Plan can in turn be looked upon in a similar manner. It does not contain a prescription for the specific set-up for tomorrow but contains a treatment of all the processes, procedures, and automated software systems that are at the operator’s disposal. The existence of an Operating Plan, however, does not preclude the need for creating specific action plans for specific SOL or IROL exceedances identified in the OPA. When a Reliability Coordinator performs an OPA, the analysis may reveal instances of possible SOL or IROL exceedances for pre- or post-Contingency conditions. In these instances, Reliability Coordinators are expected to ensure that there are plans in place to prevent or mitigate those SOLs or IROLs, should those operating conditions be encountered the next day. The Operating Plan may contain a description of the process by which specific prevention or mitigation plans for

day-to-day SOL or IROL exceedances identified in the OPA are handled and communicated. This approach could alleviate any potential administrative burden associated with perceived requirements for continual day-to-day updating of “the Operating Plan document” for compliance purposes.

操作计划——一个操作计划包括一般操作流程和具体的操作程序。它可以是一份概述文件，提供第二天的操作计划的处方，也可以是一份具体计划，以解决操作计划分析(OPA)中确定的特定SOL或IROL超标情况。与NERC的定义一致，操作计划可以是一般性质的，也可以是解决特定可靠性问题的具体计划。在修订的TOP/IRO标准中使用操作计划，为两者都留有余地。操作计划参考了包括电子数据交换在内的程序和程序，系统操作员每天都可以使用这些程序和程序，使操作员能够可靠地处理一天中可能出现的情况。有效期为明天、后天、大后天。操作计划应由临时操作指南加以补充，这些临时操作指南概述了OPA或实时评估(RTA)每天确定的特定情况的预防/缓解计划。正如术语表中的定义所述，恢复计划是操作计划的一个示例。它包含了系统操作员在恢复过程中所需要的所有总体原则。它不是为特定的停电场景编写的具体文件，而是由操作人员在恢复系统时可使用的过程、程序和自动化软件系统组成的工具集合。操作计划也可以以同样的方式来看待。它不包含明天的具体设置的处方，但包含了操作员处置的所有过程、程序和自动化软件系统的处理。然而，操作计划的存在并不排除为OPA中确定的特定SOL或IROL超标情况制定具体行动计划的必要性。当可靠性协调器执行OPA时，分析可能会揭示事故发生前或事故发生后SOL或IROL超标的实例。在这种情况下，可靠性协调人员应确保有预防或减少SOLs或irol的计划，以防第二天遇到这些运行条件。操作计划可包括对处理和通报外地处理方案中确定的每日SOL或IROL超标的具体预防或缓解计划的过程的说明。这种方法可以减轻任何潜在的管理负担，这些负担与为了遵从性目的而对“操作计划文件”进行持续的日常更新的可感知的需求有关。

# Version History 版本历史

|  |  |  |  |
| --- | --- | --- | --- |
| **Version**  **版本** | **Date**  **日期** | **Action**  **行动** | **Change Tracking**  **变更追踪** |
| 0 | April 1,  2005  2005年4月1日 | Effective Date  生效日期 | New  新 |
| 0 | August 8,  2005  2005年8月8日 | Removed “Proposed” from Effective Date  从生效日期中删除“建议”一词 | Errata  勘误 |
| 1 | November 1, 2006  2006年11月1日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 1a | May 12,  2010  2010年5月12日 | Added Appendix 1 – Interpretation of R8 approved by Board of Trustees on May 12, 2010  增加附录1 - 2010年5月12日理事会批准的R8解释 | Interpretation  解释 |
| 1a | September 15, 2011  2011年9月15日 | FERC Order issued approved the Interpretation of R8 (FERC Order became effective November 21, 2011)  发布的FERC命令批准了对R8的解释(FERC命令于2011年11月21日生效) | Interpretation  解释 |
| 2 | May 6,  2012  2012年5月6日 | Revised under Project 2007-03  在2007-03计划下修订 | Revised  校订 |
| 2 | May 9,  2012  2012年5月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 3 | February 12, 2015  2015年2月12日 | Adopted by Board of Trustees  经理事会通过 | Revisions under Project 2014-03  在项目2014-03校订 |
| 3 | November 19, 2015  2015年11月19日 | FERC approved TOP-001-3. Docket No. RM15-16-000. Order No. 817.  FERC批准TOP-001-3。审单编号RM15 -16-000号。命令817号。 | Approved  同意 |
| 4 | February 9, 2017  2017年2月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 4 | April 17,  2017  2017年4月17日 | FERC letter Order approved TOP-001-   1. Docket No. RD17-4-000 2. FERC批准的信件命令TOP-001-4。摘要编号RD17-4-000 |  |
| 5 | May 9, 2019  2019年5月19日 | Adopted by Board of Trustees  经理事会通过 | R19 and R22 retired under Project 2018-03 Standards Efficiency Review Retirements  R19和R22根据2018-03项目标准效率评审止用 |

**Guidelines and Technical Basis 指引及技术基础**

None 无

# Rationale

Rationale text from the development of TOP-001-3 in Project 2014-03 and TOP-001-4 in Project 2016-01 follows. Additional information can be found on the [Project 2014-03](https://www.nerc.com/pa/Stand/Pages/Project-2014-03-Revisions-to-TOP-and-IRO-Standards.aspx) and [Project 2016-](https://www.nerc.com/pa/Stand/Pages/Project-2016-01-Modifications-to-TOP-and-IRO-Standards.aspx) [01](https://www.nerc.com/pa/Stand/Pages/Project-2016-01-Modifications-to-TOP-and-IRO-Standards.aspx) pages.

以下是项目2014-03中的TOP-001-3和项目2016-01中的TOP-001-4的开发原理。其他信息可在项目2014-03和项目2016- 01页上找到。

## Rationale for Requirement R3:

The phrase ‘cannot be physically implemented’ means that a Transmission Operator may request something to be done that is not physically possible due to its lack of knowledge of the system involved.

**要求R3的基本原理:**

短语“不能在根本上实现”是指输电运营商可能由于其对所涉及的系统缺乏知识而请求在根本上不可能完成的事情。

## Rationale for Requirement R10: 要求R10的基本原理:

New proposed Requirement R10 is derived from approved IRO-003-2, Requirement R1, adapted to the Transmission Operator Area. This new requirement is in response to NOPR paragraph 60 concerning monitoring capabilities for the Transmission Operator. New Requirement R11 covers the Balancing Authorities. Monitoring of external systems can be accomplished via data links.

新提议的要求R10源自经批准的IRO-003-2要求R1，适用于输电运营商区域。这项新要求是对NOPR第60段关于输电运营商监控能力的响应。新的需求R11涵盖了平衡权威。外部系统的监控可以通过数据链路来完成。

The revised requirement addresses directives for Transmission Operator (TOP) monitoring of some non-Bulk Electric System (BES) facilities as necessary for determining System Operating Limit (SOL) exceedances (FERC Order No. 817 Para 35-36). The proposed requirement corresponds with approved IRO-002-4 Requirement R4 (proposed IRO-002-5 Requirement R5), which specifies the Reliability Coordinator's (RC) monitoring responsibilities for determining SOL exceedances.

修订后的规定针对输电运营商(TOP)监测一些非大型电力系统(BES)设施以确定系统运行极限(SOL)超出所需的指令(FERC第817号命令第35-36段)。拟议的要求符合已批准的IRO-002-4要求R4(拟议的IRO-002-5要求R5)，该要求规定了可靠性协调者(RC)对确定SOL超出的监控责任。

The intent of the requirement is to ensure that all facilities (i.e., BES and non-BES) that can adversely impact reliability of the BES 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.

该要求的目的是确保对所有可能对BES可靠性产生不利影响的设施(即BES和非BES)进行监测。正如TOP和IRO可靠性标准所使用的，监控包括实时观察运行状态和运行值，以了解系统状况。确定SOL超标所必需的设施应指定为BES的一部分，或通过规划和运行研究(如TOP-002-4要求R1和IRO-008-2要求的运行计划分析(OPA))确定后纳入监测。SDT认识到，并非所有最高管理者认为满足其监测需要的非最佳预算外设施都需要包括在最佳预算内。

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 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 the TOP to identify a non-BES facility that should be temporarily monitored for determining SOL exceedances.

上层要求监测的非预算外设施仅是上层在其输电运营商范围内确定SOL超标所需的设施。在执行各种分析和研究作为功能性的义务的一部分,可能会导致识别non-BES设施应监测确定溶胶超过数点。例子包括:

* OPA;
* 实时评估(RTA)；
* 由TOP执行的裂解作为BES异常处理的一部分，用于在BES中包括一个设;和
* 可在RC的大修协调过程中指定的分析，该分析可引导TOP确定应临时监控的非BES设施，以确定SOL超标。

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.

TOP-003-3要求R1规定，TOP应制定数据规范，其中包括TOP支持OPAs、实时监控和RTAs所需的数据和信息。这包括高层认为必要的非bes数据和外部网络数据。

The format of the proposed requirement has been changed from the approved standard to more clearly indicate which monitoring activities are required to be performed.

拟议要求的格式已从批准的标准改为更清楚地表明需要进行哪些监测活动。

## Rationale for Requirement R13: 要求R13的基本原理：

The new Requirement R13 is in response to NOPR paragraphs 55 and 60 concerning Real-time analysis responsibilities for Transmission Operators and is copied from approved IRO-008-1, Requirement R2. The Transmission Operator’s Operating Plan will describe how to perform the Real-time Assessment. The Operating Plan should contain instructions as to how to perform Operational Planning Analysis and Real-time Assessment with detailed instructions and timing requirements as to how to adapt to conditions where processes, procedures, and automated software systems are not available (if used). This could include instructions such as an indication that no actions may be required if system conditions have not changed significantly and that previous Contingency analysis or Real-time Assessments may be used in such a situation.

新的要求R13是对NOPR第55段和第60段关于输电运营商实时分析责任的响应，并从批准的IRO-008-1，要求R2中复制。输电运营商的运营计划将描述如何执行实时评估。操作计划应包含如何执行操作计划分析和实时评估的说明，以及如何适应流程、程序和自动化软件系统不可用（如果使用）的条件的详细说明和时间要求。这可能包括指示，例如，如果系统条件没有发生重大变化，则无需采取任何行动，在这种情况下，可以使用先前的应急分析或实时评估。

## Rationale for Requirement R14:

The original Requirement R8 was deleted and original Requirements R9 and R11 were revised in order to respond to NOPR paragraph 42 which raised the issue of handling all SOLs and not just a sub-set of SOLs. The SDT has developed a white paper on SOL exceedances that explains its intent on what needs to be contained in such an Operating Plan. These Operating Plans are developed and documented in advance of Real-time and may be developed from Operational Planning Assessments required per proposed TOP-002-4 or other assessments. Operating Plans could be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an Operational Planning Assessment or a Real-time Assessment. The intent is to have a plan and philosophy that can be followed by an operator.

删除了原始要求R8，修订了原始要求R9和R11，以响应NOPR第42段，该段提出了处理所有SOL而不仅仅是SOL子集的问题。SDT已经制定了一份关于SOL超标的白皮书，解释了其在此类运营计划中需要包含哪些内容的意图。这些运行计划是在实时之前制定和记录的，可以根据建议的TOP-002-4或其他评估要求的运行计划评估制定。可通过临时操作指南对操作计划进行补充，临时操作指南概述了日常操作计划评估或实时评估中确定的特定情况的预防/缓解计划。其目的是要有一个计划和哲学，可以遵循一个经营者。

## Rationale for Requirements R16 and R17: 要求R16和R17的基本原理：

In response to IERP Report recommendation 3 on authority.

针对关于权力的IERP报告建议3。

## Rationale for Requirement R18: 要求R18的基本原理：

Moved from approved IRO-005-3.1a, Requirement R10. Transmission Service Provider, Distribution Provider, Load-Serving Entity, Generator Operator, and Purchasing-Selling Entity are deleted as those entities will receive instructions on limits from the responsible entities cited in the requirement. Note – Derived limits replaced by SOLs for clarity and specificity. SOLs include voltage, Stability, and thermal limits and are thus the most limiting factor.

源于批准的要求R10的IRO-005-3.1a。输电服务提供商、配电提供商、负荷服务实体、发电机运营商和购销实体将被删除，因为这些实体将从要求中引用的负责实体收到有关限制的指示。注:推导的限度取代了溶胶的清晰度和特异性。SOLs包括电压、稳定性和热极限，因此是最大的限制因素。

## Rationale for Requirements R19 and R20 (R19, R20, R22, and R23 in TOP-001-4):

## 要求R19和R20的基本原理(在TOP-001-4的R19, R20, R22和R23):

[Note: Requirement R19 proposed for retirement under Project 2018-03 Standards Efficiency Review Retirements.]

[注:根据2018-03项目标准效率审阅止用计划申请止用的要求R19。]

The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

拟议的修改地址指示冗余和不同的路由数据交换能力(FERC第817号命令第47段)。

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, 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.

冗余和多样化数据交换路由功能包括数据交换基础设施组件(如交换机、路由器、服务器、电源、网络布线和这些组件之间的通信路径的主要控制中心的交换系统运行数据)将提供持续的功能,尽管失败或单个组件的故障传播算子的主控制中心(上)。冗余和多种路由的数据交换功能防止了主控制中心数据交换基础设施中的单点故障，从而阻止了实时数据流的中断。要求R20不要求数据交换的自动或瞬时故障转移能力。根据TOP的主控制中心内的基础设施或硬件的安排，可以通过各种方式实现不稳定和不同的路由。

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

冗余的可靠性目标是在中断、维护或测试数据交换基础设施期间提供持续的数据交换功能。对于个别数据交换组件的计划或非计划中断期间，建议的需求不需要额外的冗余数据交换基础设施组件，仅仅是为了提供冗余。

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

建议的需求不涉及不在TOP主控制中心内的基础设施。

## Rationale for Requirement R21: 要求R21的基本原理：

The proposed requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

拟议要求涉及主要控制中心所用数据交换能力测试指令（联邦能源监管委员会第817号命令第51段）。

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). 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.

## 冗余功能测试表明，尽管单个组件（如交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径，用于交换系统操作数据）。随着时间的推移，实体的测试实践应该检查其数据交换功能的各种故障模式。当一个实际的事件成功地执行了冗余功能时，它可以被认为是一个测试，用于提出的需求。

## Rationale for Requirements R22 and R23: 要求R22和R23的基本原理：

[Note: Requirement R22 proposed for retirement under Project 2018-03 Standards Efficiency Review Retirements]

[注:根据2018-03项目标准效率审阅止用计划申请止用的要求R22和R23。]

The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

拟议的修改涉及数据交换能力的冗余和多样化路由指令（联邦能源监管委员会第817号命令第47段）。

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, 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.

冗余和不同路由的数据交换功能由数据交换基础设施组件组成（例如，交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径（用于交换系统操作数据），即使平衡机构（BA）主控制中心中的单个组件出现故障或故障，也能提供持续的功能。冗余和不同路由的数据交换功能可防止主控制中心数据交换基础设施中的单点故障中断实时数据流。要求R23不要求数据交换功能的自动或瞬时故障转移。根据平衡机构的主要控制中心内的基础设施或硬件的安排，可以通过各种方式实现不稳定和不同的路由。

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

冗余的可靠性目标是在数据交换基础设施的中断、维护或测试期间提供持续的数据交换功能。对于单个数据交换组件的计划内或计划外停机期间，拟议的要求不需要额外的冗余数据交换基础设施组件来提供冗余。

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

建议的要求没有涉及平衡机构主要控制中心之外的基础设施。

## Rationale for Requirement R24: 要求R24的基本原理：

The proposed requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

拟议要求涉及主要控制中心所用数据交换能力测试指令（联邦能源监管委员会第817号命令第51段）。

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component(e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). 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.

冗余功能测试表明，尽管单个组件（如交换机、路由器、服务器、电源、，以及主控制中心中这些组件之间的网络布线和通信路径，用于交换系统操作数据）。随着时间的推移，实体的测试实践应该检查其数据交换功能的各种故障模式。当一个实际的事件成功地执行了冗余功能时，它可以被认为是一个测试，用于提出的需求。

## Introduction A.介绍

* 1. **Title: Operations Planning 1. 标题：运营规划**
  2. **Number: TOP-002-4 2. 编号：TOP-002-4**
  3. **Purpose:** To ensure that Transmission Operators and Balancing Authorities have plans for operating within specified limits.

**3.目的：**确保输电运营商和平衡机构有在规定的限制内运行的计划。

## Applicability: 4.适用范围：

* + 1. Transmission Operator 4.1. 输电运营商
    2. Balancing Authority 4.2. 平衡机构

## Effective Date: 5.生效日期

See Implementation Plan. 见执行计划

## Background: 6.背景

See Project 2014-03 project page. 见项目2014-03项目页。

## Requirements and Measures B.要求与措施

**R1.** Each Transmission Operator shall have an Operational Planning Analysis that will allow it to assess whether its planned operations for the next day within its Transmission Operator Area will exceed any of its System Operating Limits (SOLs). *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R1.** 每个输电运营商应具备一份运营计划分析，以评估其在其输电运营商区域内第二天的计划运营是否将超过其任何系统运营限制(SOLs)。*[违规风险因素:中等][时间范围:运营计划]*

**M1.** Each Transmission Operator shall have evidence of a completed Operational Planning Analysis. Such evidence could include but is not limited to dated power flow study results.

M1. 每个输电运营商应拥有完整的运营计划分析的证据。这样的证据可能包括但不限于注明日期的的功率流研究的结果。

**R2.** Each Transmission Operator shall have an Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) exceedances identified as a result of its Operational Planning Analysis as required in Requirement R1. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R2.** 每个输电运营商都应有一份第二天运营的运营计划，以解决运营计划分析结果中根据要求R1确定的潜在系统运营限制(SOL)超标问题。*[违规风险因素:中等][时间范围:运营计划]*

**M2.** Each Transmission Operator shall have evidence that it has an Operating Plan to address potential System Operating Limits (SOLs) exceedances identified as a result of the Operational Planning Analysis performed in Requirement R1. Such evidence could include but it is not limited to plans for precluding operating in excess of each SOL that was identified as a result of the Operational Planning Analysis.

**M2.** 每个输电运营商应有证据证明其有一个运营计划，以解决根据要求R1中的运营计划分析确定的潜在系统运营限制(SOLs)超出。这类证据可以包括但不限于防止操作超出作为业务规划分析结果确定的每个SOL的计划。

**R3.** Each Transmission Operator shall notify entities identified in the Operating Plan(s) cited in Requirement R2 as to their role in those plan(s). *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R3.** 各输电运营商应将其在要求R2中引用的运营计划中所指明的实体告知其在这些计划中的角色。*[违规风险因素:中等][时间范围:运营计划]*

**M3.** Each Transmission Operator shall have evidence that it notified entities identified in the Operating Plan(s) cited in Requirement R2 as to their role in the plan(s). Such evidence could include but is not limited to dated operator logs, or e-mail records.

M3. 每个输电运营商应拥有证据，证明其通知了要求R2中引用的运营计划中确定的实体，说明其在计划中的部分。这些证据可能包括但不限于注明日期的操作员日志或电子邮件记录。

**R4.** Each Balancing Authority shall have an Operating Plan(s) for the next-day that addresses: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R4.** 每个平衡机构应具有次日的操作计划，该操作计划涉及:*[违规风险因素:中等][时间范围:操作计划]*

* 1. Expected generation resource commitment and dispatch

**4.1** 预期的发电资源承诺和调度

* 1. Interchange scheduling

**4.2** 交换调度

* 1. Demand patterns

**4.3** 需求模式

* 1. Capacity and energy reserve requirements, including deliverability capability

**4.4** 容量和能源储备要求，包括产能

**M4.** Each Balancing Authority shall have evidence that it has developed a plan to operate within the criteria identified. Such evidence could include but is not limited to dated operator logs or e-mail records.

**M4.** 每个平衡机构应有证据证明其已制定了在确定的标准内运行的计划。这些证据可能包括但不限于注明日期的操作员日志或电子邮件记录。

**R5.** Each Balancing Authority shall notify entities identified in the Operating Plan(s) cited in Requirement R4 as to their role in those plan(s). *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R5.** 各平衡机构应通知要求R4中所引用的经营计划中所确定的实体其在这些计划中的角色。*[违规风险因素:中等][时间范围:运营计划]*

**M5.** Each Balancing Authority shall have evidence that it notified entities identified in the plan(s) cited in Requirement R4 as to their role in the plan(s). Such evidence could include but is not limited to dated operator logs or e-mail records.

**M5.** 每个平衡机构都应该有证据证明它通知了要求R4中引用的计划中确定的实体，说明它们在计划中的角色。这些证据可能包括但不限于注明日期的操作员日志或电子邮件记录。

**R6.** Each Transmission Operator shall provide its Operating Plan(s) for next-day operations identified in Requirement R2 to its Reliability Coordinator. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R6.** 每个输电运营商应向其可靠性协调员提供其在要求R2中确定的第二天操作的运行计划。*[违规风险因素:中等][时间范围:运营计划]*

**M6.** Each Transmission Operator shall have evidence that it provided its Operating Plan(s) for next-day operations identified in Requirement R2 to its Reliability Coordinator.

Such evidence could include but is not limited to dated operator logs or e-mail records.

M6. 每个输电运营商应向其可靠性协调员提供证据，证明其已向其可靠性协调员提供了要求R2中确定的第二天操作的运行计划。这些证据可能包括但不限于注明日期的操作员日志或电子邮件记录。

**R7.** Each Balancing Authority shall provide its Operating Plan(s) for next-day operations identified in Requirement R4 to its Reliability Coordinator. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

**R7.** 每个平衡机构应向其可靠性协调机构提供需求R4中确定的第二天操作的运行计划。*[违规风险因素:中等][时间范围:运营计划]*

**M7.** Each Balancing Authority shall have evidence that it provided its Operating Plan(s) for next-day operations identified in Requirement R4 to its Reliability Coordinator. Such evidence could include but is not limited to dated operator logs or e-mail records.

M7. 每个平衡机构应有证据证明其向其可靠性协调机构提供了要求R4中确定的第二天操作的运行计划。这些证据可能包括但不限于注明日期的操作员日志或电子邮件记录。

## Compliance C.合规手段

* 1. **Compliance Monitoring Process** 1.合规监控过程:
     1. **Compliance Enforcement Authority**

As defined in the NERC Rules of Procedure, “Compliance Enforcement Authority” (CEA) means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.

* 1. **合规执法机构:**

“合规执行机构”系指NERC或区域实体，或由适用的政府机构指定的任何实体，在各自的管辖范围内各自履行监督和/或强制执行可靠性标准的职责。

## Compliance Monitoring and Assessment Processes 1.2. 合规监测和评估流程

As defined in the NERC Rules of Procedure, “Compliance Monitoring and

Assessment Processes” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated reliability standard.

按照NERC程序规则的定义，“合规性监测和评估过程”指的是将用于评估数据或信息的过程的识别，以评估性能或结果与相关的可靠性标准。

## Data Retention 1.3. 数据保留

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

以下证据保存期确定了一个实体被要求保留特定证据以证明合规的时间期限。如果以下规定的证据保留期比上次审计后的时间短，合规执行机构可以要求实体提供其他证据，以证明其在上次审计后的完整时间内是合规的。

Each Transmission Operator and Balancing Authority shall keep data or evidence to show compliance for each applicable Requirement for a rolling 90-calendar days period for analyses, the most recent 90-calendar days for voice recordings, and 12 months for operating logs and e-mail records unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

每个输电运营商和平衡机构应保存数据或证据，以表明符合每项适用要求，滚动90个日历天的周期进行分析，最近的90个日历天进行语音记录，12个月的操作日志和电子邮件记录，除非合规执行机构指示将特定证据保留更长的时间作为调查的一部分。

If a Transmission Operator or Balancing Authority is found non-compliant, it shall keep information related to the non-compliance until found compliant or the time period specified above, whichever is longer.

如果发现输电运营商或平衡机构不符合规定，它应保存与不符合规定有关的信息，直到发现符合规定或上述规定的时间期限(以较长者为准)。

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records

合规执行机构应保留上次审核记录以及所有要求和提交的后续审核记录

## Additional Compliance Information 1.4. 其他合规信息

None. 无

## Table of Compliance Elements

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **R #** | **Time Horizon**  **时间范围** | **VRF** | **Violation Severity Levels**  **违规严重性级别** | | | |
| **Lower VSL**  **低违规级别** | **Moderate VSL**  **中等违规级别** | **High VSL**  **高违规级别** | **Severe VSL**  **严重违规级别** |
| R1 | Operations  Planning  运营规划 | Medium  中等 | N/A | N/A | N/A | The Transmission  Operator did not  have an Operational  Planning Analysis  allowing it to assess  whether its planned  operations for the  next day within its  Transmission  Operator Area  exceeded any of its  System Operating  Limits (SOLs).  该输电运营商没有运营计划分析，从而无法评估其计划的第二天在其输电运营商区域内的运营是否超过了任何系统运营限制(SOLs)。 |
| R2 | Operations  Planning  运营规划 | Medium  中等 | N/A | N/A | N/A | The Transmission  Operator did not  have an Operating  Plan to address  potential System  Operating Limit  (SOL) exceedances  identified as a result  of the Operational  Planning Analysis  performed in  Requirement R1.  输电运营商没有一个运行计划来解决需求R1中运行计划分析所确定的潜在系统运行极限(SOL)超出。 |

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| --- | --- | --- | --- | --- | --- | --- |
| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| For the Requirement R3 and R5 VSLs only, the intent of the SDT is to start with the Severe VSL first and then to work your way to the left until you find the situation that fits. In this manner, the VSL will not be discriminatory by size of entity. If a small entity has just one affected reliability entity to inform, the intent is that that situation would be a Severe violation.  仅对于要求R3和R5 VSL, SDT的目的是首先从严重的VSL开始，然后一直向左工作，直到找到适合的情况。通过这种方式，VSL将不会因实体的大小而受到歧视。如果一个小的实体只有一个受影响的可靠性实体要通知，其意图是这种情况将是一个严重的违反。 | | | | | | |
| R3 | Operations Planning  运营规划 | Medium  中等 | The Transmission Operator did not notify one impacted entity or 5% or less of the entities, whichever is greater identified in the Operating Plan(s) as to their role in the plan(s).  输电运营商未就其在计划中的角色通知受影响的实体或5%或以下的实体(以运营计划中确定的较大者为准)。 | The Transmission Operator did not notify two entities or more than 5% and less than or equal to 10% of the impacted entities, whichever is greater, identified in the Operating Plan(s) as to their role in the plan(s).  输电运营商未就其在运营计划中所扮演的角色通知两个实体或超过受影响实体的5%至10%(以两者中较大者为准)。 | The Transmission Operator did not notify three impacted entities or more than 10% and less than or equal to 15% of the entities, whichever is greater, identified in the Operating Plan(s) as to their role in the plan(s).  输电运营商未就其在运营计划中的角色通知三个受影响实体或超过10%、小于或等于15%的实体(以较大者为准)。 | The Transmission Operator did not notify four or more entities or more than 15% of the impacted NERC identified in the Operating Plan(s) as to their role in the plan(s).  输电运营商没有就其在计划中的角色通知四个或四个以上的实体或运营计划中确定的受影响的NERC的15%以上。 |
| R4 | Operations Planning  运营规划 | Medium  中等 | The Balancing Authority has an Operating Plan but it does not address one of the criteria in Requirement R4.  平衡机构有一个运营计划，但它没有满足要求R4中的标准之一。 | The Balancing Authority has an Operating Plan but it does not address two of the criteria in Requirement R4.  平衡机构有一个运营计划，但它没有满足要求R4中的两个标准。 | The Balancing Authority has an Operating Plan but it does not address three of the criteria in Requirement R4.  平衡机构有一个运营计划，但它没有满足要求R4中的三个标准。 | The Balancing Authority did not have an Operating Plan.  平衡机构没有运营计划。 |
| R5 | Operations Planning  运营规划 | Medium  中等 | The Balancing Authority did not notify one impacted entity or 5% or less of the entities,  whichever is greater,  identified in the  Operating Plan(s) as  to their role in the plan(s).  平衡机构未通知受影响的实体或5%或以下的实体(以经营计划中确定的较大的为准)其在计划中的部分。 | The Balancing Authority did not notify two entities or more than 5% and less than or equal to  10% of the impacted  entities, whichever  is greater, identified  in the Operating  Plan(s) as to their role in the plan(s).  平衡机构未通知受影响的两个实体或受影响实体的5%以上小于或等于10%  (以经营计划中确定的较大的为准)其在计划中的部分。 | The Balancing Authority did not notify three impacted entities or more than 10% and  less than or equal to  15% of the entities,  whichever is greater,  identified in the  Operating Plan(s) as  to their role in the plan(s).  平衡机构未通知受影响的三个实体或受影响实体的10%以上小于或等于15%  (以经营计划中确定的较大的为准)其在计划中的部分。 | The Balancing Authority did not notify four or more entities or more than 15% of the impacted  entities identified in  the Operating Plan(s)  as to their role in the plan(s).  平衡机构未通知受影响的四个实体或5%及以上的实体(以经营计划中确定的较大的为准)其在计划中的部分。 |

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| --- | --- | --- | --- | --- | --- | --- |
| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| R6 | Operations  Planning  运营规划 | Medium  中等 | N/A | N/A | N/A | The Transmission  Operator did not  provide its Operating  Plan(s) for next-day  operations as  identified in  Requirement R2 to its  Reliability  Coordinator.  输电运营商未向其可靠性协调人提供其在要求R2中确定的第二天操作的操作计划。 |
| R7 | Operations  Planning  运营规划 | Medium  中等 | N/A | N/A | N/A | The Balancing  Authority did not  provide its Operating  Plan(s) for next-day  operations as  identified in  Requirement R4 to its  Reliability  Coordinator.  平衡机构没有向其可靠性协调机构提供需求R4中确定的第二天操作的操作计划。 |

1. **Regional Variances D.区域变化**

None. 无

## Interpretations E. 解释

None. 无

## Associated Documents F. 相关文件

Operating Plan - An Operating Plan includes general Operating Processes and specific Operating Procedures. It may be an overview document which provides a prescription for an Operating Plan for the next-day, or it may be a specific plan to address a specific SOL or IROL exceedance identified in the Operational Planning Analysis (OPA). Consistent with the NERC definition, Operating Plans can be general in nature, or they can be specific plans to address specific reliability issues. The use of the term Operating Plan in the revised TOP/IRO standards allows room for both. An Operating Plan references processes and procedures which are available to the System Operator on a daily basis to allow the operator to reliably address conditions which may arise throughout the day. It is valid for tomorrow, the day after, and the day after that. Operating Plans should be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an OPA or a Real-time Assessment (RTA). As the definition in the Glossary of Terms states, a restoration plan is an example of an Operating Plan. It contains all the overarching principles that the System Operator needs to work his/her way through the restoration process. It is not a specific document written for a specific blackout scenario but rather a collection of tools consisting of processes, procedures, and automated software systems that are available to the operator to use in restoring the system. An Operating Plan can in turn be looked upon in a similar manner. It does not contain a prescription for the specific set-up for tomorrow but contains a treatment of all the processes, procedures, and automated software systems that are at the operator’s disposal. The existence of an Operating Plan, however, does not preclude the need for creating specific action plans for specific SOL or IROL exceedances identified in the OPA. When a Reliability Coordinator performs an OPA, the analysis may reveal instances of possible SOL or IROL exceedances for pre- or post-Contingency conditions. In these instances, Reliability Coordinators are expected to ensure that there are plans in place to prevent or mitigate those SOLs or IROLs, should those operating conditions be encountered the next day. The Operating Plan may contain a description of the process by which specific prevention or mitigation plans for day-to-day SOL or IROL exceedances identified in the OPA are handled and communicated. This approach could alleviate any potential administrative burden associated with perceived requirements for continual day-to-day updating of “the Operating Plan document” for compliance purposes.

操作计划——一个操作计划包括一般操作流程和具体的操作程序。它可以是一份概述文件，提供第二天的操作计划的处方，也可以是一份具体计划，以解决操作计划分析(OPA)中确定的特定SOL或IROL超标情况。与NERC的定义一致，操作计划可以是一般性质的，也可以是解决特定可靠性问题的具体计划。在修订的TOP/IRO标准中使用操作计划，为两者都留有余地。操作计划参考了包括电子数据交换在内的程序和程序，系统操作员每天都可以使用这些程序和程序，使操作员能够可靠地处理一天中可能出现的情况。有效期为明天、后天、大后天。操作计划应由临时操作指南加以补充，这些临时操作指南概述了OPA或实时评估(RTA)每天确定的特定情况的预防/缓解计划。正如术语表中的定义所述，恢复计划是操作计划的一个示例。它包含了系统操作员在恢复过程中所需要的所有总体原则。它不是为特定的停电场景编写的具体文件，而是由操作人员在恢复系统时可使用的过程、程序和自动化软件系统组成的工具集合。操作计划也可以以同样的方式来看待。它不包含明天的具体设置的处方，但包含了操作员处置的所有过程、程序和自动化软件系统的处理。然而，操作计划的存在并不排除为OPA中确定的特定SOL或IROL超标情况制定具体行动计划的必要性。当可靠性协调器执行OPA时，分析可能会揭示事故发生前或事故发生后SOL或IROL超标的实例。在这种情况下，可靠性协调人员应确保有预防或减少SOLs或irol的计划，以防第二天遇到这些运行条件。操作计划可包括对处理和通报外地处理方案中确定的每日SOL或IROL超标的具体预防或缓解计划的过程的说明。这种方法可以减轻任何潜在的管理负担，这些负担与为了遵从性目的而对“操作计划文件”进行持续的日常更新的可感知的需求有关。

**Version History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version**  **版本** | **Date**  **日期** | **Action**  **行动** | **Change Tracking**  **变更追踪** |
| 0 | April 1, 2005  2005年4月1日 | Effective Date  生效日期 | New  新 |
| 0 | August 8, 2005  2005年8月8日 | Removed “Proposed” from Effective Date  从生效日期中删除“建议”一词 | Errata  勘误 |
| 1 | August 2, 2006  2006年8月2号 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 2 | November 1, 2006  2006年11月1日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 2 | June 14, 2007  2007年6月14日 | Fixed typo in R11., (subject to …)  修正了R11中的错误。，(以…为准) | Errata  勘误 |
| 2a | February 10, 2009  2009年2月10日 | Added Appendix 1 – Interpretation of R11 approved by BOT on February 10, 2009  增加了附录1 - 2009年2月10日由BOT批准的R11解释 | Interpretation  注释 |
| 2a | December 2, 2009  2009年12月2日 | Interpretation of R11 approved by FERC on December 2, 2009  FERC于2009年12月2日批准了R11的解释 | Same Interpretation  相同注释 |
| 2b | November 4, 2010  2010年11月4日 | Added Appendix 2 – Interpretation of R10 adopted by the Board of Trustees  增加附录2 -理事会通过的R10注释 |  |
| 2b | October 20, 2011  2011年10月20日 | FERC Order issued approving the  Interpretation of R10 (FERC’s Order became effective on October 20, 2011)  FERC发布批准R10的解释(FERC的命令生效于2011年10月20日) |  |
| 2.1b | March 8, 2012  2012年3月8日 | Errata adopted by Standards Committee;  标准委员会通过的勘误表;  (Removed unnecessary language from the Effective Date section. Deleted retired sub-requirements from Requirement R14)  (从生效日期部分删除了不必要的语言。从要求R14中删除已止用的次级要求) | Errata  勘误 |
| 2.1b | April 11, 2012  2012年4月11日 | Additional errata adopted by Standards Committee; (Deleted language from retired sub-requirement from Measure M7)  标准委员会通过的补充勘误表;(从M7措施的已止用子要求中删除语言) | Errata  勘误 |
| 2.1b | September 13, 2012  2012年9月13日 | FERC approved  FERC通过 | Errata  勘误 |
| 3 | May 6, 2012  2012年5月6日 | Revisions under Project 2007-03  根据2007-03项目的修订 | Revised  校正 |
| 3 | May 9, 2012  2012年5月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校正 |
| 4 | April 2014  2014年4月 | Revisions under Project 2014-03  根据2014-03项目的修订 | Revised  校正 |
| 4 | November 13, 2014  2014年11月13日 | Adopted by NERC Board of Trustees  经理事会通过 | Revisions under Project 2014-03  根据2014-03项目的修订 |
| 4 | November 19, 2015  2015年11月19日 | FERC approved TOP-002-4. Docket No.  RM15-16-000. Order No. 817.  FERC批准TOP-001-3。审单编号RM15 -16-000号。命令817号 |  |

**Guidelines and Technical Basis指引及技术基础**

**Rationale: 理论基础**

During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.

在这个标准的开发过程中，文本框被嵌入到标准中来解释标准各个部分的基本原理。在BOT批准后，理论基础文本框中的文本被移到此部分。

## Rationale for Definitions: 理论定义：

Changes made to the proposed definitions were made in order to respond to issues raised in NOPR paragraphs 55, 73, and 74 dealing with analysis of SOLs in all time horizons, questions on Protection Systems and Special Protection Systems in NOPR paragraph 78, and recommendations on phase angles from the SW Outage Report (recommendation 27). The intent of such changes is to ensure that Real-time Assessments contain sufficient details to result in an appropriate level of situational awareness. Some examples include: 1) analyzing phase angles which may result in the implementation of an Operating Plan to adjust generation or curtail transactions so that a Transmission facility may be returned to service, or 2) evaluating the impact of a modified Contingency resulting from the status change of a Special Protection Scheme from enabled/in-service to disabled/out-of-service.

对提议的定义进行了修改，以回应NOPR第55、73和74段中提出的问题，这些问题涉及所有时间段的sol分析，NOPR第78段中关于保护系统和特殊保护系统的问题，以及SW停电报告中关于相位角度的建议(建议27)。这种变化的目的是确保实时评估包含足够的细节，从而产生适当的态势感知水平。一些例子包括:1)分析可能导致运行计划实施的相位角度，以调整发电或减少事务，以便输电设施可以恢复服务，或2)评估特殊保护方案状态从启用/在用变为禁用/不在用所产生的修改后的意外事件的影响。

## Rationale for R1: R1理论基础：

Terms deleted in Requirement R1 as they are now contained in the revised definition of Operational Planning Analysis

条款在要求R1中删除，因为它们现在包含在修订后的运营计划分析的定义中

## Rationale for R2: R2理论基础

The change to Requirement R2 is in response to NOPR paragraph 42 and in concert with proposed changes made to proposed TOP-001-4

对要求R2的修改是对NOPR第42段的响应，并配合对拟议的TOP-001-4所作的修改

## Rationale for R3: R3理论基础：

Changes in response to IERP recommendation

回应IERP建议的更改

## Rationale for R4 and R5: R4和R5理论基础：

These Requirements were added to address IERP recommendations

添加这些要求是为了解决IERP建议

## Rationale for R6 and R7: R6和R7的基本原理:

Added in response to SW Outage Report recommendation 1

添加针对SW停机报告建议1

针对SW停机报告建议1

## Introduction A.介绍

* 1. **Title: Operational Reliability Data 1. 标题：合理可靠性数据**
  2. **Number: TOP-003-3 2.编号：TOP-003-3**
  3. **Purpose:** To ensure that the Transmission Operator and Balancing Authority have data needed to fulfill their operational and planning responsibilities.

**3.目的：**确保输电运营商和平衡机构拥有履行其运营和计划职责所需的数据。

## Applicability: 4.适用范围：

* + 1. Transmission Operator **4.1.**输电运营商
    2. Balancing Authority **4.2.**平衡机构
    3. Generator Owner **4.3.**发电机拥有者
    4. Generator Operator 4.4.发电机运营商
    5. Load-Serving Entity **4.5.**负荷服务实体
    6. Transmission Owner 4.6.输电拥有者
    7. Distribution Provider 4.7.配电供应商

## Effective Date: 5.生效日期

See Implementation Plan. 见实施计划

## Background: 6.背景：

See Project 2014-03 [project page](http://www.nerc.com/pa/Stand/Pages/Project-2014-03-Revisions-to-TOP-and-IRO-Standards.aspx). 见项目2014-03项目页。

## Requirements and Measures B.要求和措施

**R1.** Each Transmission Operator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments. The data specification shall include, but not be limited to: *[Violation Risk Factor: Low] [Time Horizon: Operations Planning]*

**R1.** 每个输电运营商应保持一份文件化的数据规范，以执行其运营计划分析、实时监控和实时评估所需的数据。数据规范应包括但不限于:*[违反风险因素:低][时间范围:运营计划]*

* 1. A list of data and information needed by the Transmission Operator to support its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments including non-BES data and external network data as deemed necessary by the Transmission Operator.
  2. Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability.
  3. A periodicity for providing data.
  4. The deadline by which the respondent is to provide the indicated data.
  5. 输电运营商为支持其运营计划分析、实时监控和实时评估所需的数据和信息列 表，包括输电运营商认为必要的非bes数据和外部网络数据。
  6. 影响系统可靠性的当前保护系统和特殊保护系统状态或降级通知规定。
  7. 提供数据的周期。
  8. 答复人提供所指出的数据的截止日期。

**M1.** Each Transmission Operator shall make available its dated, current, in force documented specification for data.

**M1.** 每个输电运营商应提供其日期、现行的和有效的数据规范文件。

**R2.** Each Balancing Authority shall maintain a documented specification for the data necessary for it to perform its analysis functions and Real-time monitoring. The data specification shall include, but not be limited to: *[Violation Risk Factor: Low] [Time Horizon: Operations Planning]*

**R2.** 每个平衡机构应对其执行分析功能和实时监控所需的数据保持文件化的规格。数据规范应包括但不限于:*[违反风险因素:低][时间范围:运营计划]*

* 1. A list of data and information needed by the Balancing Authority to support its analysis functions and Real-time monitoring.
  2. Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability.
  3. A periodicity for providing data.
  4. The deadline by which the respondent is to provide the indicated data.

2.1. 平衡机构支持其分析功能和实时监控所需的数据和信息列表。

2.2. 影响系统可靠性的当前保护系统和特殊保护系统状态或降级通知规定。

2.3. 提供数据的周期。

2.4. 答复人提供所指出的数据的截止日期。

**M2.** Each Balancing Authority shall make available its dated, current, in force documented specification for data.

M2. 各平衡机构应提供其日期、现行和有效的数据规范文件。

**R3.** Each Transmission Operator shall distribute its data specification to entities that have data required by the Transmission Operator’s Operational Planning Analyses, Real- time monitoring, and Real-time Assessment. *[Violation Risk Factor: Low] [Time Horizon: Operations Planning]*

**R3.** 各输电运营商应当将其数据规范发给具有输电运营商运营规划分析、实时监测、实时评估所需数据的单位。*[违反风险因素:低][时间范围:运营计划]*

**M3.** Each Transmission Operator shall make available evidence that it has distributed its data specification to entities that have data required by the Transmission Operator’s Operational Planning Analyses, Real-time monitoring, and Real-time Assessments.

Such evidence could include but is not limited to web postings with an electronic notice of the posting, dated operator logs, voice recordings, postal receipts showing the recipient, date and contents, or e-mail records.

**M3.** 各输电运营商应提供证据，证明其已将其数据规范分发给具有输电运营商运营计划分析、实时监控和实时评估所需数据的实体。此类证据可以包括但不限于带有张贴电子通知的网页张贴、注明日期的操作员日志、语音记录、显示收件人、日期和内容的邮政收据或电子邮件记录。

**R4.** Each Balancing Authority shall distribute its data specification to entities that have data required by the Balancing Authority’s analysis functions and Real-time monitoring. *[Violation Risk Factor: Low] [Time Horizon: Operations Planning]*

**R4.** 各平衡机构应将其数据规范分发给具有平衡机构分析功能和实时监控所需数据的实体。*[违反风险因素:低][时间范围:运营计划]*

**M4.** Each Balancing Authority shall make available evidence that it has distributed its data specification to entities that have data required by the Balancing Authority’s analysis functions and Real-time monitoring. Such evidence could include but is not limited to web postings with an electronic notice of the posting, dated operator logs, voice recordings, postal receipts showing the recipient, or e-mail records.

**M4.** 各平衡机构应提供证据，证明其已将其数据规范分发给具有平衡机构分析功能和实时监控所需数据的实体。此类证据可以包括但不限于带有张贴电子通知的网页张贴、注明日期的操作员日志、语音记录、显示收件人的邮政收据或电子邮件记录。

**R5.** Each Transmission Operator, Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall satisfy the obligations of the documented specifications using: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

**R5.** 接收到要求R3或R4中的数据规范的每个输电运营商、平衡机构、发电机所有者、发电机运营商、负荷服务实体、传输所有者和配电供应商，应通过以下方式履行规范文件规定的义务:*[违反风险因素:中等][时间范围:运营计划、当日运营、实时运营]*

* 1. A mutually agreeable format
  2. A mutually agreeable process for resolving data conflicts
  3. A mutually agreeable security protocol

5.1. 双方同意的格式

5.2. 解决数据冲突的双方同意的过程

5.3. 双方同意的安全协议

**M5.** Each Transmission Operator, Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall make available evidence that it has satisfied the obligations of the documented specifications. Such evidence could include, but is not limited to, electronic or hard copies of data transmittals or attestations of receiving entities.

M5. 每个接收到要求R3或R4中的数据规范的输电运营商、平衡机构、发电机所有者、发电机运营商、负载服务实体、传输所有者和配电提供商，都应提供证据证明其已满足规范文件规定的义务。这种证据可以包括但不限于数据传输的电子或硬拷贝或接收实体的证明。

## Compliance C.合规手段

* 1. **Compliance Monitoring Process 1.合规监控手段：**
     1. **Compliance Monitoring Process 1.1.合规监控过程**

As defined in the NERC Rules of Procedure, “Compliance Enforcement Authority” (CEA) means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.

按照NERC程序规则的定义，“合规执行机构”(CEA)是指NERC或区域实体在各自的角色中，监督和执行符合NERC可靠性标准。

## Compliance Monitoring and Assessment Processes 1.2.合规监测和评估流程

As defined in the NERC Rules of Procedure, “Compliance Monitoring and

Assessment Processes” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated reliability standard.

按照NERC程序规则的定义，“合规性监测和评估过程”指的是将用于评估数据或信息的过程的识别，以评估性能或结果与相关的可靠性标准。

## Data Retention 1.3.数据保留

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

以下证据保存期确定了一个实体被要求保留特定证据以证明合规的时间期限。如果以下规定的证据保留期比上次审计后的时间短，合规执行机构可以要求实体提供其他证据，以证明其在上次审计后的完整时间内是合规的。

Each responsible entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

每个负责任的实体应保存数据或证据，以显示以下所述的合规情况，除非其合规执法机构指示将特定证据保留较长时间，作为调查的一部分:

Each Transmission Operator shall retain its dated, current, in force, documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments in accordance with Requirement R1 and Measurement M1 as well as any documents in force since the last compliance audit.

每个输电运营商应根据要求R1和测量M1以及自上次符合性审核以来的任何有效文件，保留其已日期的、当前的、有效的、文件化的数据规范，以进行运营计划分析、实时监控和实时评估所需的数据。

Each Balancing Authority shall retain its dated, current, in force, documented specification for the data necessary for it to perform its analysis functions and Real-time monitoring in accordance with Requirement R2 and Measurement M2 as well as any documents in force since the last compliance audit.

每个平衡机构应保留其已日期的、当前的、有效的、文件化的规范，用于按照要求R2和测量M2执行分析功能和实时监控所需的数据，以及自上次合规审核以来的任何有效文件。

Each Transmission Operator shall retain evidence for three calendar years that it has distributed its data specification to entities that have data required by the Transmission Operator’s Operational Planning Analyses, Real-time monitoring, and Real-time Assessments in accordance with Requirement R3 and Measurement M3.

每一个输电运营商应保留其已将其数据规范分发给具有根据R3和M3要求进行运营规划分析、实时监测和实时评估所需数据的实体的证据3个日历年。

Each Balancing Authority shall retain evidence for three calendar years that it has distributed its data specification to entities that have data required by the Balancing Authority’s analysis functions and Real-time monitoring in accordance with Requirement R4 and Measurement M4.

每个平衡机构应保留三个日历年的证据，证明其已将其数据规范分发给具有平衡机构分析功能和根据要求R4和测量M4实时监控所需数据的实体。

Each Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Transmission Operator, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall retain evidence for the most recent 90-calendar days that it has satisfied the obligations of the documented specifications in accordance with Requirement R5 and Measurement M5.

每个接收到要求R3或R4中的数据规范的平衡机构、发电机所有者、发电机运营商、负荷服务实体、输电运营商、输电所有者和配电提供商，应根据要求R5和测量M5，在最近的90个日历天内保留其已履行规范文件义务的证据。

If a responsible entity is found non-compliant, it shall keep information related to the non-compliance until mitigation is complete and approved or the time period specified above, whichever is longer.

如果发现一个责任实体不符合规定，它应保存有关不符合规定的信息，直到缓解措施完成并获得批准或上述规定的时间期限为止(以较长者为准)。

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

合规执行机构应保留上次审核记录以及所有要求和提交的后续审核记录。

## Additional Compliance Information 1.4. 其他合规信息

None.无

## Table of Compliance Elements

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| R1 | Operations Planning  运营计划 | Low  低 | The Transmission Operator did not include one of the parts (Part 1.1 through Part 1.4) of the documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments.  输电运营商没有包括文件规范中的一个部分(第1.1至1.4部分)的数据，这些数据是其进行运营计划分析、实时监控和实时评估所必需的。 | The Transmission Operator did not include two of the parts (Part 1.1 through Part 1.4) of the documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments.  输电运营商没有包括文件规范的两个部分(第1.1到1.4部分)的数据，这些数据是其进行运营计划分析、实时监控和实时评估所必需的。 | The Transmission Operator did not include three of the parts (Part 1.1 through Part 1.4) of the documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments.  输电运营商没有包括规范文件中的三个部分(第1.1至1.4部分)，以提供其执行运营计划分析、实时监控和实时评估所需的数据。 | The Transmission Operator did not include four of the parts (Part 1.1 through Part 1.4) of the documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments.  输电运营商没有包括其执行运营计划分析、实时监控和实时评估所需数据的文件规范中的四个部分(第1.1至1.4部分)。  OR,  The Transmission Operator did not have a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real- time Assessments.  或者，  输电运营商没有一个文件规范的数据，必要的数据，以执行其运营计划分析，实时监测和实时评估。 |

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| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| R2 | Operations Planning  运营规划 | Low  低 | The Balancing Authority did not include one of the parts (Part 2.1 through Part 2.4) of the documented specification for the data necessary for it to perform its analysis functions and Real- time monitoring.  平衡机构没有包括规范文件中为其执行分析功能和实时监控所必需的数据的其中一部分(第2.1部分至第2.4部分)。 | The Balancing Authority did not include two of the parts (Part 2.1 through Part 2.4) of the documented specification for the data necessary for it to perform its analysis functions and Real- time monitoring.  平衡机构没有包括规范文件中两个部分(2.1到2.4部分)的数据，这些数据是其执行分析功能和实时监控所必需的。 | The Balancing Authority did not include three of the parts (Part 2.1 through Part 2.4) of the documented specification for the data necessary for it to perform its analysis functions and Real- time monitoring.  平衡机构没有包括规范文件中为其执行分析功能和实时监控所必需的数据的三个部分(2.1到2.4部分)。 | The Balancing Authority did not include four of the parts (Part 2.1 through Part 2.4) of the documented specification for the data necessary for it to perform its analysis functions and Real- time monitoring.  平衡机构没有包括规范文件中为其执行分析功能和实时监控所需数据的四个部分(第2.1部分至第2.4部分)。  OR,  The Balancing Authority did not have a documented specification for the data necessary for it to perform its analysis functions and Real- time monitoring.  或者，  平衡机构没有一个文档化的数据规范，这些数据是它执行分析功能和实时监控所必需的。 |
| For the Requirement R3 and R4 VSLs only, the intent of the SDT is to start with the Severe VSL first and then to work your way to the left until you find the situation that fits. In this manner, the VSL will not be discriminatory by size of entity. If a small entity has just one affected reliability entity to inform, the intent is that that situation would be a Severe violation.  仅对于需求R3和R4 VSL, SDT的目的是首先从严重的VSL开始，然后一直向左工作，直到找到适合的情况。通过这种方式，VSL将不会因实体的大小而受到歧视。如果一个小的实体只有一个受影响的可靠性实体要通知，其意图是这种情况将是一个严重的违反。 | | | | | | |
| R3 | Operations Planning  运营规划 | Low  低 | The Transmission Operator did not distribute its data  specification to one  entity, or 5% or less of  the entities,  whichever is greater,  that have data  required by the  Transmission  Operator’s  Operational Planning  Analyses, Real-time  monitoring, and Real-  time Assessments.  输电运营商未将其数据规范分发给具有输电运营商运营计划分析、实时监控和实时评估所需数据的一个实体或5%或以下的实体(以较大的实体为准)。 | The Transmission Operator did not distribute its data  specification to two  entities, or more than  5% and less than or  equal to10% of the  reliability entities,  whichever is greater,  that have data  required by the  Transmission  Operator’s  Operational Planning  Analyses, Real-time  monitoring, and Real-  time Assessments.  输电运营商未将其数据规范分发给两个具有输电运营商运营计划分析、实时监控和实时评估所需数据的实体，或大于5%且小于或等于10%的可靠性实体(以两者中较大者为准)。 | The Transmission Operator did not distribute its data  specification to three  entities, or more than  10% and less than or  equal to 15% of the  reliability entities,  whichever is greater,  that have data  required by the  Transmission  Operator’s  Operational Planning  Analyses, Real-time  monitoring, and Real-  time Assessments.  输电运营商未将其数据规范分发给两个具有输电运营商运营计划分析、实时监控和实时评估所需数据的实体，或大于10%且小于或等于15%的可靠性实体(以两者中较大者为准)。 | The Transmission Operator did not distribute its data  specification to four  or more entities, or  more than 15% of the  entities that have  data required by the  Transmission  Operator’s  Operational Planning  Analyses, Real-time  monitoring, and Real-  time Assessments.  输电运营商未将其数据规范分发给具有输电运营商运营计划分析、实时监控和实时评估所需数据的一个实体或15%或以上的实体(以较大的实体为准)。 |

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| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| R4 | Operations  Planning  运营规划 | Low  低 | The Balancing  Authority did not  distribute its data  specification to one  entity, or 5% or less of  the entities,  whichever is greater,  that have data  required by the  Balancing Authority’s  analysis functions and  Real-time monitoring.  平衡机构没有将其数据规范分发给一个具有平衡机构分析功能和实时监控所需数据的实体，或5%或更少的实体(以较大的实体为准)。 | The Balancing  Authority did not  distribute its data  specification to two  entities, or more than  5% and less than or  equal to 10% of the  entities, whichever is  greater, that have  data required by the  Balancing Authority’s  analysis functions and  Real-time monitoring.平衡机构没有将其数据规范分发给两个具有平衡机构分析功能和实时监控所需数据的实体，或者大于5%且小于或等于10%(以两者中较大的一个为准)。 | The Balancing  Authority did not  distribute its data  specification to three  entities, or more than  10% and less than or  equal to 15% of the  entities, whichever is  greater, that have  data required by the  Balancing Authority’s  analysis functions and  Real-time monitoring.  平衡机构没有将其数据规范分发给两个具有平衡机构分析功能和实时监控所需数据的实体，或者大于10%且小于或等于15%(以两者中较大的一个为准)。 | The Balancing  Authority did not  distribute its data  specification to four  or more entities, or  more than 15% of the  entities that have  data required by the  Balancing Authority’s  analysis functions and  Real-time monitoring.  平衡机构没有将其数据规范分发给一个具有平衡机构分析功能和实时监控所需数据的实体，或15%或更多的实体(以较大的实体为准)。 |

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| --- | --- | --- | --- | --- | --- | --- |
| **R #** | **Time Horizon** | **VRF** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| R5 | Operations Planning, Same-Day Operations, Real-time Operations  运营规划，当日作业，实时作业 | Medium  中等 | The responsible entity receiving a data specification in Requirement R3 or R4 satisfied the obligations in the data specification but did not meet one of the criteria shown in Requirement R5 (Parts 5.1 – 5.3).  接收R3或R4中数据规范的负责实体满足了数据规范中的义务，但没有满足R5(5.1 - 5.3部分)中所示的任何一个标准。 | The responsible entity receiving a data specification in Requirement R3 or R4 satisfied the obligations in the data specification but did not meet two of the criteria shown in Requirement R5 (Parts 5.1 – 5.3).  接收R3或R4中数据规范的负责实体满足了数据规范中的义务，但没有满足R5(5.1 - 5.3部分)中的两个标准。 | The responsible entity receiving a data specification in Requirement R3 or R4 satisfied the obligations in the data specification but did not meet three of the criteria shown in Requirement R5 (Parts 5.1 – 5.3).  接收R3或R4中数据规范的负责实体满足了数据规范中的义务，但没有满足R5(5.1 - 5.3部分)中的三个标准。 | The responsible entity receiving a data specification in Requirement R3 or R4 did not satisfy the obligations of the documented specifications for data.  在要求R3或R4中接收数据规范的责任实体不满足记录的数据规范的义务。 |

1. **Regional Variances**

None.

## Interpretations

None.

## Associated Documents

None.

**Version History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Action** | **Change Tracking** |
| 0 | April 1, 2005  2005年4月1日 | Effective Date  生效日期 | New  新 |
| 0 | August 8, 2005  2005年8月8日 | Removed “Proposed” from Effective Date  从生效日期中删除“建议”一词 | Errata  勘误 |
| 1 |  | Modified R1.2 Modified M1  Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs)  修正的R1.2修正的M1  替换了不符合2月28日BOT批准的违规严重程度级别(VSLs) | Revised  校订 |
| 1 | October 17, 2008  2008年10月17日 | Adopted by NERC Board of Trustees  理事会通过 |  |
| 1 | March 17, 2011  2011年3月17日 | Order issued by FERC approving TOP- 003-1 (approval effective 5/23/11)  FERC批准TOP- 003-1发出的命令(批准生效于2011年5月23日) |  |
| 2 | May 6, 2012  2012年5月6日 | Revised under Project 2007-03  根据2007-03项目下修订 | Revised  校订 |
| 2 | May 9, 2012  2012年5月9日 | Adopted by Board of Trustees  经理事会通过 | Revised  校订 |
| 3 | April 2014  2014年4月 | Changes pursuant to Project 2014-03  根据项目2014-03的变更 | Revised  校订 |
| 3 | November 13, 2014  2014年11月13日 | Adopted by Board of Trustees  经理事会通过 | Revisions under Project 2014-03  根据2014-03项目下修订 |
| 3 | November 19, 2015  2015年11月19日 | FERC approved TOP-003-3. Docket No.  RM15-16-000, Order No. 817  FERC批准TOP-001-3。审单编号RM15 -16-000号。命令817号。 |  |

## Guidelines and Technical Basis 指引及技术基础

**Rationale: 理论基础**

During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.

在这个标准的开发过程中，文本框被嵌入到标准中来解释标准各个部分的基本原理。在BOT批准后，理论基础文本框中的文本被移到此部分。

## Rationale for Definitions: 理论定义：

Changes made to the proposed definitions were made in order to respond to issues raised in NOPR paragraphs 55, 73, and 74 dealing with analysis of SOLs in all time horizons, questions on Protection Systems and Special Protection Systems in NOPR paragraph 78, and recommendations on phase angles from the SW Outage Report (recommendation 27). The intent of such changes is to ensure that Real-time Assessments contain sufficient details to result in an appropriate level of situational awareness. Some examples include: 1) analyzing phase angles which may result in the implementation of an Operating Plan to adjust generation or curtail transactions so that a Transmission facility may be returned to service, or 2) evaluating the impact of a modified Contingency resulting from the status change of a Special Protection Scheme from enabled/in-service to disabled/out-of-service.

对提议的定义进行了修改，以回应NOPR第55、73和74段中提出的问题，这些问题涉及所有时间段的sol分析，NOPR第78段中关于保护系统和特殊保护系统的问题，以及SW停电报告中关于相位角度的建议(建议27)。这种变化的目的是确保实时评估包含足够的细节，从而产生适当的态势感知水平。一些例子包括:1)分析可能导致运行计划实施的相位角度，以调整发电或减少事务，以便传输设施可以恢复服务，或2)评估特殊保护方案状态从启用/在用变为禁用/不在用所产生的修改后的意外事件的影响。

## Rationale for R1: R1的理论基础

Changes to proposed Requirement R1, Part 1.1 are in response to issues raised in NOPR paragraph 67 on the need for obtaining non-BES and external network data necessary for the Transmission Operator to fulfill its responsibilities.

对要求R1第1.1部分的修改是为了回应NOPR第67段中提出的关于输电运营商履行其职责所需获取非bes和外部网络数据的需要的问题。

Proposed Requirement R1, Part 1.2 is in response to NOPR paragraph 78 on relay data. The language has been moved from approved PRC-001-1.

提议的要求R1，第1.2部分是对NOPR第78段中继数据的响应，已从核准的PRC-001-1中移出。

Corresponding changes have been made to Requirement R2 for the Balancing Authority and to proposed IRO-010-2, Requirement R1 for the Reliability Coordinator.

关于平衡机构的要求R2和关于可靠性协调器的建议的IRO-010-2要求R1已作出相应的更改。

## Rationale for R5: R5的理论基础

Proposed Requirement R5, Part 5.3 is in response to NOPR paragraph 92 where concerns were raised about data exchange through secured networks.

提议的要求R5，第5.3部分是对NOPR第92段的回应，其中对通过安全网络交换数据提出了关注。

## Introduction A.介绍

* 1. **Title: Real-time Reliability Monitoring and Analysis Capabilities**

**1. 标题： 实时可靠性监测和分析能力**

* 1. **Number: TOP-010-1(i)**

**2. 编号： TOP-010-1(i)**

* 1. **Purpose:** Establish requirements for Real-time monitoring and analysis capabilities to support reliable System operations.

3. 目的： 建立实时监控和分析能力的要求，以支持可靠的系统运 行。

## Applicability: 4.适用范围：

* + 1. **Functional Entities: 4.1.功能性实体**
       1. Transmission Operators 4.1.1. 输电运营商
       2. Balancing Authorities 4.1.2. 平衡机构
  1. **Effective Date:** See Implementation Plan 5.生效日期：见实施计划

## Requirements and Measures B.要求和措施

**R1.** Each Transmission Operator shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real- time monitoring and Real-time Assessments. The Operating Process or Operating Procedure shall include: *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R1.** 每个输电运营商应实施操作流程或操作程序，以解决实时数据的质量问题，这是进行实时监测和实时评估所必需的。操作过程或操作程序应包括:*[违章风险因素:高][时间范围:实时操作]*

* 1. Criteria for evaluating the quality of Real-time data;
  2. Provisions to indicate the quality of Real-time data to the System Operator; and
  3. Actions to address Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects Real-time Assessments.
  4. 实时数据质量评估标准;
  5. 规定向系统操作员显示实时数据的质量;和
  6. 当数据质量影响实时评估时，与负责提供数据的实体(ies)一起解决实时数据质量问题的措施。

**M1.** Each Transmission Operator shall have evidence that it implemented its Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. This evidence could include, but is not limited to: 1) an Operating Process or Operating Procedure in electronic or hard copy format meeting all provisions of Requirement R1; and 2) evidence the Transmission Operator implemented the Operating Process or Operating Procedure as called for in the Operating Process or Operating Procedure, such as dated operator logs, dated checklists, voice recordings, voice transcripts, or other evidence.

M1。每个输电运营商应有证据证明其实施了其操作过程或操作程序，以解决实时数据的质量，这是实施实时监测和实时评估所必需的。该证据可以包括但不限于:1)符合要求R1的所有规定的电子或硬拷贝格式的操作过程或操作程序;2)输电运营商按照《操作规程》或《操作规程》的要求执行操作规程或操作规程的证据，如注明日期的操作员日志、注明日期的核对表、语音记录、语音誊本或其他证据。

**R2.** Each Balancing Authority shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis functions and Real-time monitoring. The Operating Process or Operating Procedure shall include: *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R2.** 每个平衡机构应实施操作过程或操作程序，以解决执行其分析功能和实时监控所需的实时数据的质量问题。操作过程或操作程序应包括:*[违章风险因素:高][时间范围:实时操作]*

* 1. Criteria for evaluating the quality of Real-time data;
  2. Provisions to indicate the quality of Real-time data to the System Operator; and
  3. Actions to address Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects its analysis functions.

2.1. 实时数据质量评估标准;

2.2. 规定向系统操作员显示实时数据的质量;和

2.3. 当数据质量影响数据分析功能时，与负责提供数据的实体(ies)一起解决实时数据质量问题的行动。

**M2.** Each Balancing Authority shall have evidence that it implemented its Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis functions and Real-time monitoring. This evidence could include, but is not limited to: 1) an Operating Process or Operating Procedure in electronic or hard copy format meeting all provisions of Requirement R2; and 2) evidence the Balancing Authority implemented the Operating Process or Operating Procedure as called for in the Operating Process or Operating Procedure, such as dated operator logs, dated checklists, voice recordings, voice transcripts, or other evidence.

M2。每个平衡机构应有证据证明其实施了其操作过程或操作程序，以解决执行其分析功能和实时监控所需的实时数据的质量问题。该证据可以包括但不限于:1)符合要求R2所有规定的电子或纸质格式的操作过程或操作程序;2)证据:平衡机构按照操作过程或操作程序的要求执行操作过程或操作程序，如有日期的操作员日志、有日期的核对表、语音记录、语音誊本或其他证据。

**R3.** Each Transmission Operator shall implement an Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments. The Operating Process or Operating Procedure shall include: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

**R3.** 每个输电运营商应实施操作流程或操作程序，以解决其实时评估中使用的分析质量问题。操作过程或操作程序应包括:*[违规风险因素:中等][时间范围:实时操作]*

* 1. Criteria for evaluating the quality of analysis used in its Real-time Assessments;
  2. Provisions to indicate the quality of analysis used in its Real-time Assessments; and
  3. Actions to address analysis quality issues affecting its Real-time Assessments.

3.1. 用于实时评估的分析质量评估标准;

3.2. 规定用于实时评估的分析质量;和

3.3. 解决影响实时评估的分析质量问题的行动。

**M3.** Each Transmission Operator shall have evidence it implemented its Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments as specified in Requirement R3. This evidence could include, but is not limited to: 1) an Operating Process or Operating Procedure in electronic or hard copy format meeting all provisions of Requirement R3; and 2) evidence the Transmission Operator implemented the Operating Process or Operating Procedure as called for in the Operating Process or Operating Procedure, such as dated operator logs, dated checklists, voice recordings, voice transcripts, or other evidence.

M3。每个输电运营商应有证据证明其按照要求R3规定实施了其操作过程或操作程序，以解决其实时评估中使用的分析质量问题。该证据可以包括但不限于:1)符合要求R3所有规定的电子或纸质的操作过程或操作程序;2)输电运营商按照《操作规程》或《操作规程》的要求执行操作规程或操作规程的证据，如注明日期的操作员日志、注明日期的核对表、语音记录、语音誊本或其他证据。

**R4.** Each Transmission Operator and Balancing Authority shall have an alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

**R4.** 每个输电运营商和平衡机构都应有一个报警过程监视器，当其实时监控报警处理器发生故障时，该监视器向其系统操作员提供通知。*[违反风险因素:中等][时间范围:实时操作]*

**M4.** Each Transmission Operator and Balancing Authority shall have evidence of an alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred. This evidence could include, but is not limited to, operator logs, computer printouts, system specifications, or other evidence.

M4。每个输电运营商和平衡机构都应有报警过程监视器的证据，当其实时监控报警处理器发生故障时，报警过程监视器向其系统操作员提供通知。此证据可以包括但不限于，操作员日志、计算机打印、系统说明或其他证据。

## Compliance C.合规手段

* 1. **Compliance Monitoring Process** 1.合规监控过程:
     1. **Compliance Enforcement Authority**

As defined in the NERC Rules of Procedure, “Compliance Enforcement Authority” (CEA) means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.

* 1. **合规执法机构:**

“合规执行机构”系指NERC或区域实体，或由适用的政府机构指定的任何实体，在各自的管辖范围内各自履行监督和/或强制执行可靠性标准的职责。

## 1.3 Evidence Retention: 1.3 证据保留

The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show it was compliant for the full-time period since the last audit.

以下证据保留期限指实体被要求保留特定证据以证明合规的期限。如果以下规定的证据保留期比上次审计后的时间短，合规执行机构可以要求实体提供其他证据，以证明其在上次审计后的全职期间是合规的。

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.适用实体应保存数据或证据，以证明符合下述规定，除非其合规执行机构指示将特定证据保留较长时间，作为调查的一部分。

The applicable entity shall retain evidence of compliance for Requirements R1, R2, and R4, and Measures M1, M2, and M4 for the current calendar year and one previous calendar year, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

单位应当保留证据的合规需求R1、R2和R4,和措施M1, M2,和M4为当前日历年和一个以前的日历年,除了操作日志和语音记录应保留至少90日历天,除非由其合规执法机构保留更长一段时间的具体证据,作为调查的一部分。

The Transmission Operator shall retain evidence of compliance for Requirement R3 and Measure M3 for a rolling 30-day period, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

输电运营商应保留符合要求R3和措施M3的证据，持续30天，除非其合规执行机构指示保留特定证据更长的时间，作为调查的一部分。

If an applicable entity is found non-compliant it shall keep information related to the non-compliance until mitigation is complete and approved or for the time specified above, whichever is longer.

如果发现一个适用实体不符合规定，它应保存与不符合规定有关的信息，直到缓解措施完成并获得批准或在上述规定的时间内(以较长时间为准)。

## Compliance Monitoring and Enforcement Program 1.4.合规性监视和执行程序

As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

按照NERC程序规则的定义，“合规性监测和执行计划”指的是用于评估数据或信息的过程的识别，目的是评估性能或结果与相关的可靠性标准。

## Violation Severity Levels

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **R #** | **Violation Severity Levels** | | | |
| **Lower VSL** | **Moderate VSL** | **High VSL** | **Severe VSL** |
| **R1.** | N/A | The Transmission Operator's Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments did not include one of the elements listed in Part 1.1 through Part 1.3.  输电运营商的操作流程或操作程序，以解决实时数据的质量，这是执行实时监测和实时评估所必需的，不包括第1.1至1.3部分中列出的要素之一。 | The Transmission Operator's Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments did not include two of the elements listed in Part 1.1 through Part 1.3.  输电运营商的操作流程或操作程序，以解决实时数据的质量，这是执行实时监测和实时评估所必需的，不包括第1.1至1.3部分中列出的两个要素。 | The Transmission Operator's Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments did not include any of the elements listed in Part 1.1 through Part 1.3;  输电运营商处理实时数据质量所需的操作流程或操作程序，以执行实时监控和实时评估，不包括第1.1至1.3部分所列的任何要素;  OR  The Transmission Operator did not implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments.  或者，  输电运营商没有实施操作流程或操作程序来解决实时数据的质量问题，这是执行实时监控和实时评估所必需的。 |
| **R2.** | N/A | The Balancing Authority's Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis functions and Real-time monitoring did not include one of the elements listed in Part 2.1 through Part 2.3.  平衡机构处理执行其分析功能和实时监控所需的实时数据质量的操作流程或操作程序不包括第2.1至2.3部分所列的要素之一。 | The Balancing Authority's Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis functions and Real-time monitoring did not include two of the elements listed in Part 2.1 through Part 2.3.  平衡机构处理执行其分析功能和实时监控所需的实时数据质量的操作流程或操作程序不包括第2.1至2.3部分所列的两个要素。 | The Balancing Authority's Operating Process or Operating Procedure to address the quality of the  Real-time data necessary to perform its analysis functions and Real-time monitoring did not include any of the elements listed in Part 2.1 through Part 2.3;  平衡机构为处理其分析功能及实时监察所需的实时数据的质素而制定的运作程序或运作程序，并没有包括第2.1至2.3部所列的任何要素;  OR  The Balancing Authority did not implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis functions and Real- time monitoring.  或者，  平衡机构没有实施操作流程或操作程序来解决执行其分析功能和实时监控所需的实时数据的质量问题。 |
| **R3.** | N/A | The Transmission Operator's Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments did not include one of the elements listed in Part 3.1 through Part 3.3.  输电运营商用于实时评估的分析质量的操作流程或操作程序不包括第3.1至3.3部分所列的要素之一。 | The Transmission Operator's Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments did not include two of the elements listed in Part 3.1 through Part 3.3.  输电运营商用于实时评估的分析质量的操作流程或操作程序不包括第3.1至3.3部分所列的两个要素。 | The Transmission Operator's Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments did not include any of the elements listed in Part 3.1 through Part 3.3;  输电运营商用于实时评估的分析质量的操作流程或操作程序不包括第3.1至3.3部分所列的任何要素;  OR  The Transmission Operator did not implement an Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments.  或者，输电运营商没有实施操作流程或操作程序来解决其实时评估中使用的分析质量问题。 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **R4.** | N/A | N/A | The responsible entity has an alarm process monitor but the alarm process monitor did not provide notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor occurred.  负责单位有报警过程监视器，但当其实时监控报警处理器发生故障时，报警过程监视器未向其系统操作人员提供通知。 | The responsible entity does not have an alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred.  负责的实体没有报警过程监控器，当其实时监控报警处理器发生故障时，向其系统操作员提供通知。 |

1. **Regional Variances D. 区域变量**

None. 无

## Associated Documents E. 相关文件

* Implementation Plan Implementation Plan

## Version History

|  |  |  |  |
| --- | --- | --- | --- |
| **Version**  **版本** | **Date**  **日期** | **Action行动** | **Change Tracking**  **变更追踪** |
| 1 | October 30,  2015  2015年10月30日 | New standard developed in Project 2009-02 to respond to recommendations in Real-time Best Practices Task Force Report and FERC directives.  项目2009-02中制定的标准，以响应实时最佳实践工作队报告和FERC指令中的建议。 | N/A |
| 1 | May 5, 2016、2016年5月5日 | Adopted by the Board of Trustees  经理事会同意 | New  新的 |
| 1 | September 22,  2016  2016年9月22日 | FERC Order issued approving TOP-010-1. Docket No. RD16-6-000  FERC批准TOP-010-1。审单编号RM16 -6-000号。 |  |
| 1(i) | September 22,  2016  2016年9月22日 | FERC directive to change Requirement 1 and Requirement 2 from ‘medium’ to ‘high’. Docket No. RD16-6-000  FERC指令将要求1和要求2从“中等”改为“高”。审单编号RD16 -6-000号。 | Revised  校订 |
| 1(i) | November 2,  2016  2016年11月2日 | Adopted by the Board of Trustees  经理事会同意 | New  新 |
| 1(i) | December 14,  2016  2016年12月14日 | FERC letter Order approving revisions to the VRF for R1 and R2 from ‘medium’ to ‘high’. Docket No.  RD16-6-001.  FERC批准对R1和R2的VRF从“中”到“高”的修订的顺序。审单编号RD16 -6-000号。 |  |

**Guidelines and Technical Basis 指引和技术基础**

*Real-time monitoring,* or *monitoring* the Bulk Electric System (BES) in Real-time, is a primary function of Reliability Coordinators (RCs), Transmission Operators (TOPs), and Balancing Authorities (BAs) as required by TOP and IRO Reliability Standards. As used in TOP and IRO Reliability Standards, monitoring involves observing operating status and operating values in Real-time for awareness of system conditions. Real-time monitoring may include the following activities performed in Real-time:

根据TOP和IRO可靠性标准的要求，实时监控或实时监控大容量电力系统(BES)是可靠性协调器(RCs)、输电运营商(TOPs)和平衡机构(BAs)的主要功能。正如TOP和IRO可靠性标准所使用的，监控包括实时观察运行状态和运行值，以了解系统状况。实时监控可以包括以下实时执行的活动:

* Acquisition of operating data;
* Display of operating data as needed for visualization of system conditions;
* Audible or visual alerting when warranted by system conditions; and
* Audible or visual alerting when monitoring and analysis capabilities degrade or become unavailable.

 收购操作数据

 显示所需的操作数据可视化系统的条件

 声音或视觉报警时系统保证的条件和

 声音或视觉报警时监测和分析功能降低或不可用。

**Requirement R1 要求R1**

The TOP uses a set of Real-time data identified in TOP-003-3 Requirement R1 to perform its Real-time monitoring and Real-time Assessments. Functional requirements to perform monitoring and Real-time Assessments appear in other Reliability Standards.

TOP使用TOP-003-3要求R1中确定的一组实时数据来执行其实时监控和实时评估。执行监视和实时评估的功能要求出现在其他可靠性标准中。

The TOP's Operating Process or Operating Procedure must contain criteria for evaluating the quality of Real-time data as specified in proposed TOP-010-1 Requirement R1 Part 1.1. The criteria support identification of applicable data quality issues, which may include:

TOP的操作过程或操作程序必须包含根据TOP-010-1要求R1第1.1部分规定的实时数据质量评估标准。该标准支持识别适用的数据质量问题，包括:

* + Data outside of a prescribed data range;
  + Analog data not updated within a predetermined time period;
  + Data entered manually to override telemetered information; or
  + Data otherwise identified as invalid or suspect.

规定以外的数据范围;

模拟数据不更新在一个预定的时期;

覆盖遥测数据手动输入信息;或

数据否则认定为无效或怀疑。

The Operating Process or Operating Procedure must include provisions for indicating the quality of Real-time data to operating personnel. Descriptions of quality indicators such as display color codes, data quality flags, or other such indicators as found in Real-time monitoring specifications could be used.

操作过程或操作程序必须包括向操作人员表明实时数据质量的规定。可以使用诸如显示颜色代码、数据质量标志或实时监控规范中发现的其他质量指标的批评。

Requirement R1 Part 1.3 specifies the TOP shall include actions to address Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects Real-time Assessments. Requirement R1 Part 1.3 is focused on addressing data point quality issues affecting Real-time Assessments. Other data quality issues of a lower priority are addressed according to an entity's operating practices and are not covered under Requirement R1 Part 1.3.

要求R1第1.3部分规定，当数据质量影响实时评估时，TOP应包括与负责提供数据的实体(ies)解决实时数据质量问题的措施。要求R1第1.3部分关注的是解决影响实时评估的数据点质量问题。其他优先级较低的数据质量问题是根据实体的操作实践来解决的，在要求R1第1.3部分中没有涉及。

The TOP's actions to address data quality issues are steps within existing authorities and capabilities that provide awareness and enable the TOP to meet its obligations for performing the Real-time Assessment. Examples of actions to address data quality issues include, but are not limited to, the following:

TOP处理数据质量问题的行动是在现有的权威和能力范围内的步骤，这些措施提供了认识，并使TOP能够履行其履行实时评估的义务。解决数据质量问题的行动示例包括但不限于以下:

* + Notifying entities that provide Real-time data to the TOP;
  + Following processes established for resolving data conflicts as specified in TOP-003-3, or other applicable Reliability Standards;
  + Taking corrective actions on the TOP's own data;
  + Changing data sources or other inputs so that the data quality issue no longer affects the TOP's Real-time Assessment; and
  + Inputting data manually and updating as necessary.

通知实体提供实时数据的;

后过程建立了解决数据冲突中指定- 003 - 3,或其他适用的可靠性标准;

采取纠正措施在顶部的数据;

改变数据源或其他输入,数据质量问题不再影响顶部的实时评估;和

在必要时手动输入数据和更新。

The Operating Process or Operating Procedure must clearly identify to operating personnel how to determine the data that affects the quality of the Real-time Assessment so that effective actions can be taken to address data quality issues in an appropriate time frame.

操作过程或操作程序必须清晰地向操作人员识别如何确定影响实时评估质量的数据，以便在适当的时间范围内采取有效的措施解决数据质量问题。

**Requirement R2 要求R2**

The BA uses a set of Real-time data identified in TOP-003-3 Requirement R2 to perform its analysis functions and Real-time monitoring. Requirements to perform monitoring appear in other Reliability Standards.

平衡机构使用一组在TOP-003-3需求R2中识别的实时数据来执行其分析功能和实时监控。执行监控的要求出现在其他可靠性标准中。

The BA's Operating Process or Operating Procedure must contain criteria for evaluating the quality of Real-time data as specified in proposed TOP-010-1 Requirement R2 Part 2.1. The criteria supports identification of applicable data quality issues, which may include:

平衡机构的操作过程或操作程序必须包含根据TOP-010-1要求R2第2.1部分规定的实时数据质量评估标准。该标准支持识别适用的数据质量问题，其中可能包括:

* + Data outside of a prescribed data range;
  + Analog data not updated within a predetermined time period;
  + Data entered manually to override telemetered information; or
  + Data otherwise identified as invalid or suspect.

规定以外的数据范围;

模拟数据不更新在一个预定的时期;

覆盖遥测数据手动输入信息;或

数据否则认定为无效或怀疑。

The Operating Process or Operating Procedure must include provisions for indicating the quality of Real-time data to operating personnel. Descriptions of quality indicators such as display color codes, data quality flags, or other such indicators as found in Real-time monitoring specifications could be used.

操作规程或操作规程中必须有向操作人员说明实时数据质量的规定。可以使用质量指标的描述，如显示色码、数据质量标志或实时监控规范中发现的其他此类指标。

Requirement R2 Part 2.3 specifies the BA shall include in its Operating Process or Operating Procedure actions to address Real-time data quality issues when data quality affects its analysis functions. Requirement R2 Part 2.3 is focused on addressing data point quality issues affecting analysis functions. Other data quality issues of a lower priority are addressed according to an entity's operating practices and are not covered under Requirement R2 Part 2.3.

要求R2第2.3部分规定，当数据质量影响其分析功能时，BA应在其操作过程或操作程序中包括解决实时数据质量问题的措施。需求R2第2.3部分着重于解决影响分析功能的数据点质量问题。其他优先级较低的数据质量问题是根据实体的操作实践来解决的，不包括在要求R2 2.3部分中。

The BA's actions to address data quality issues are steps within existing authorities and capabilities that provide awareness and enable the BA to meet its obligations for performing its analysis functions. Examples of actions to address data quality issues include, but are not limited to, the following:

平衡机构处理数据质量问题的行动是现有权限和能力范围内的步骤，这些权限和能力提供了认识，并使平衡机构能够履行其履行其分析功能的义务。解决数据质量问题的行动示例包括但不限于以下:

* + Notifying entities that provide Real-time data to the BA;
  + Following processes established for resolving data conflicts as specified in TOP-003-3 or other applicable Reliability Standards;
  + Taking corrective actions on the BA's own data;
  + Changing data sources or other inputs so that the data quality issue no longer affects the BA's analysis functions; and
  + Inputting data manually and updating as necessary.

通知实体向巴提供实时数据;

后过程建立了解决数据冲突规定最高- 003 - 3或其他适用的可靠性标准;

记录数据源或其他输入，使数据质量问题不再影响平衡机构的分析功能

更改数据来源或其他输入，使数据质量问题不再影响平衡机构的分析功能;和

在必要时手动输入数据和更新。

The Operating Process or Operating Procedure must clearly identify to operating personnel how to determine the data that affects the analysis quality so that effective actions can be taken to address data quality issues in an appropriate timeframe.

操作过程或操作程序必须清晰地向操作人员识别如何确定影响分析质量的数据，以便在适当的时间范围内采取有效的措施解决数据质量问题。

**Requirement R3 要求R3**

Requirement R3 ensures TOPs have procedures to address issues related to the quality of the analysis results used for Real-time Assessments. Requirements to perform Real-time Assessments appear in other Reliability Standards. Examples of the types of analysis used in Real-time Assessments may include, as applicable, state estimation, Real-time Contingency analysis, Stability analysis or other studies used for Real-time Assessments.

要求R3确保TOPs有处理实时评估分析结果质量相关问题的程序。其他可靠性标准也要求进行实时评估。在实时评估中使用的分析类型的例子可能包括，如适用，状态估计，实时应急分析，稳定性分析或其他用于实时评估的研究。

Examples of the types of criteria used to evaluate the quality of analysis used in Real-time Assessments may include solution tolerances, mismatches with Real-time data, convergences, etc.

用于评估实时评估分析质量的标准类型的例子可能包括解决方案的公差，与实时数据的不匹配，收敛等。

The Operating Process or Operating Procedure must describe how the quality of analysis results used in Real-time Assessment will be shown to operating personnel.

操作过程或操作程序必须描述实时评估中使用的分析结果的质量将如何显示给操作人员。

**Requirement R4 要求R4**

Requirement R4 addresses recommendation S7 of the Real-time Best Practices Task Force report concerning operator awareness of alarm availability.

要求R4提出了实时最佳实践工作组报告中关于操作人员感知警报可用性的建议S7。

An alarm process monitor could be an application within a Real-time monitoring system or it could be a separate system. 'Heartbeat' or 'watchdog' monitors are examples of an alarm process monitor. An alarm process monitor should be designed and implemented such that a stall of the Real-time monitoring alarm processor does not cause a failure of the alarm process monitor.

警报进程监视器可以是实时监控系统中的应用程序，也可以是单独的系统。‘Heartbeat’或‘watchdog’监视器是告警进程监视器的例子。应该设计并实现一种报警过程监视器，使实时监控报警处理器的暂停不会引起报警过程监视器的故障。

## Rationale 理论基础

**Rationale for Requirement R1: R1的理论基础**

The Transmission Operator (TOP) uses a set of Real-time data identified in TOP-003-3 Requirement R1 to perform its Real-time monitoring and Real-time Assessments. Functional requirements to perform Real-time monitoring and Real-time Assessments appear in other Reliability Standards.

输电运营商(TOP)使用TOP-003-3要求R1中确定的一组实时数据来执行其实时监测和实时评估。执行实时监控和实时评估的功能要求出现在其他可靠性标准中。

The Operating Process or Operating Procedure must include provisions for indicating the quality of Real-time data to operating personnel. Descriptions of quality indicators such as display color codes, data quality flags, or other such indicators as found in Real-time monitoring specifications could be used.

操作规程或操作规程中必须有向操作人员说明实时数据质量的规定。可以使用质量指标的描述，如显示色码、数据质量标志或实时监控规范中发现的其他此类指标。

Requirement R1 Part 1.3 of this standard specifies the TOP shall include actions to address Real- time data quality issues affecting its Real-time Assessments in its Operating Process or Operating Procedure. Examples of actions to address Real-time data quality issues are provided in the Guidelines and Technical Basis section. These actions could be the same as the process used to resolve data conflicts required by TOP-003-3 Requirement R5 Part 5.2, provided that this process addresses Real-time data quality issues.

R1要求本标准的第1.3部分规定，TOP应包括处理影响其操作过程或操作程序中实时评估的实时数据质量问题的措施。指南和技术基础部分提供了解决实时数据质量问题的行动示例。这些操作可以与TOP-003-3需求R5 5.2部分所要求的解决数据冲突的流程相同，前提是该流程可以解决实时数据质量问题。

The revision in Part 1.3 to address Real-time data quality issues *when data quality affects Real- time Assessments* clarifies the scope of data points that must be covered by the Operating Process or Operating Procedure.

为了解决数据质量影响实时评估时的实时数据质量问题，第1.3部分的修订明确了操作过程或操作程序必须涵盖的数据点的范围

**Rationale for Requirement R2: R2的理论基础**

The Balancing Authority (BA) uses a set of Real-time data identified in TOP-003-3 Requirement R2 to perform its analysis functions and Real-time monitoring. Requirements to perform monitoring appear in other Reliability Standards.

平衡机构(BA)使用一组在TOP-003-3需求R2中识别的实时数据来执行其分析功能和实时监控。执行监控的要求出现在其他可靠性标准中。

The Operating Process or Operating Procedure must include provisions for indicating the quality of Real-time data to operating personnel. Descriptions of quality indicators such as display color codes, data quality flags, or other such indicators as found in Real-time monitoring specifications could be used.

操作规程或操作规程中必须有向操作人员说明实时数据质量的规定。可以使用质量指标的描述，如显示色码、数据质量标志或实时监控规范中发现的其他此类指标。

Requirement R2 Part 2.3 of this standard specifies the BA shall include actions to address Real- time data quality issues affecting its analysis functions in its Operating Process or Operating Procedure. Examples of actions to address Real-time data quality issues are provided in the Guidelines and Technical Basis section. These actions could be the same as the process to resolve data conflicts required by TOP-003-3 Requirement R5 Part 5.2 provided that this process addresses Real-time data quality issues.

本标准第2.3部分规定，BA应包括在其操作过程或操作过程中处理影响其分析功能的实时数据质量问题的操作。指南和技术基础部分提供了解决实时数据质量问题的行动示例。这些操作可以与TOP-003-3需求R5 Part 5.2中解决数据冲突的流程相同，前提是该流程可以解决实时数据质量问题。

The revision in Part 2.3 to address Real-time data quality issues *when data quality affects its analysis functions* clarifies the scope of data points that must be covered by the Operating Process or Operating Procedure.

第2.3部分的修订，以解决数据质量影响其分析功能时的实时数据质量问题，阐明了操作过程或操作过程必须涵盖的数据点的范围

**Rationale for Requirement R3: R3的理论基础**

Requirement R3 ensures TOPs have procedures to address issues related to the quality of the analysis results used for Real-time Assessments.

要求R3确保输电运营商有处理实时评估分析结果质量相关问题的程序。

Requirements to perform Real-time Assessments appear in other Reliability Standards. Examples of the types of analysis used in Real-time Assessments include, as applicable, state estimation, Real-time Contingency analysis, Stability analysis or other studies used for Real-time Assessments.

其他可靠性标准也要求进行实时评估。在实时评估中使用的分析类型的例子包括，如适用，状态估计，实时应急分析，稳定性分析或其他用于实时评估的研究。

The Operating Process or Operating Procedure must include provisions for how the quality of analysis results used in Real-time Assessment will be shown to operating personnel. Operating personnel includes System Operators and staff responsible for supporting Real-time operations.

操作过程或操作程序必须包括如何向操作人员显示实时评估中使用的分析结果质量的规定。操作人员包括系统操作人员和支持实时操作的人员。

**Rationale for Requirement R4: R4的理论基础**

The requirement addresses recommendation S7 of the Real- time Best Practices Task Force report concerning operator awareness of alarm availability.

该要求提出了实时最佳实践工作组报告中关于操作人员关注警报可用性的建议S7。

The requirement in Draft Two of the proposed standard has been revised for clarity by removing the term *independent*. The alarm process monitor must be able to provide notification of failure of the Real-time monitoring alarm processor. This capability could be provided by an application within a Real-time monitoring system or by a separate component used by the System Operator. The alarm process monitor must not fail with a simultaneous failure of the Real-time monitoring alarm processor.

拟议标准草案二中的要求已经过订正，以澄清独立一词。报警过程监控必须能够提供实时监控报警的故障通知处理器。这种功能可以由实时监控系统中的应用程序提供，也可以由系统操作员使用的单独组件提供。报警过程监控器不能在实时监控报警处理器同时出现故障时发生故障。