

Reliability Standards: Definition, Development, and Applicability

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What is a Reliability Standard?



Reliability Standard is the term used to describe the mandatory requirements that users, owners, and operators of the bulk power system (BPS) must follow to ensure the reliable operation of the BPS.



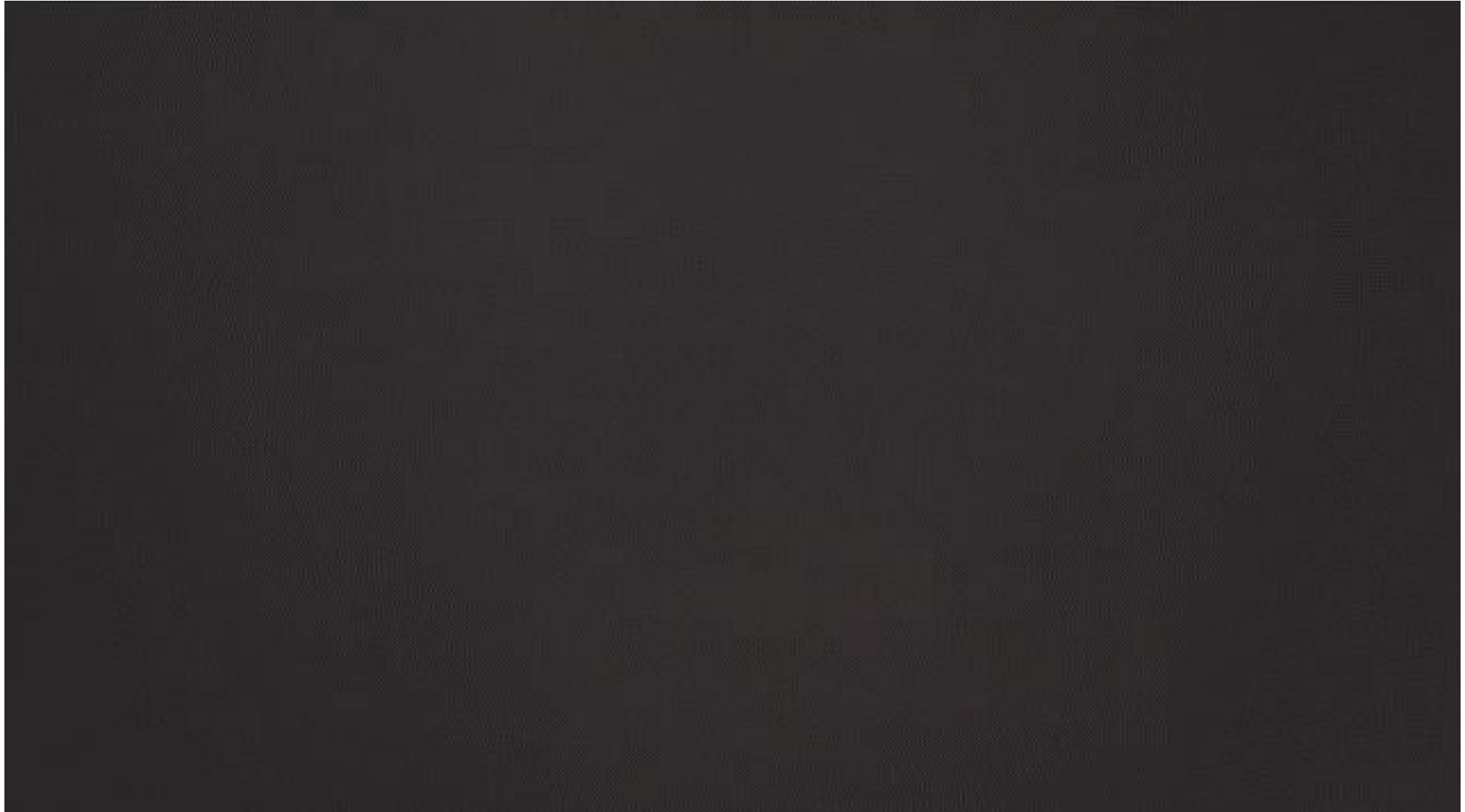
Reliability Standards impose requirements on the users, owners, and operators of the bulk power system to ensure that they fulfill their responsibilities in reliable grid operations, consistent with the basic engineering functions and concepts.

Why Do We Have Mandatory Standards?

“There’s a thin line between civilization and chaos, and that line is electricity.”

—Charles Haden Savage

2003 – The Great Northeast Blackout



2003 – The Great Northeast Blackout



- Reliability Standards are the direct result of a blackout that occurred on August 14, 2003, affecting an estimated 50 million people and 61,800 MW of electric load throughout large portions of eastern Canada and the United States.
- Although utilities successfully restored power to most customers within hours, some areas in the United States did not have power restored for several days. Parts of Ontario suffered rolling blackouts for up to two weeks before full power was restored.

2003 – The Great Northeast Blackout



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- The 2003 Northeast Blackout was caused by a combination of human error and equipment failures.
- A generating plant near Cleveland, Ohio, tripped off-line amid high heat and high electrical demand.
- The hot day also caused power lines to sag as higher currents due to power losses heated the lines.
- A transmission line in northern Ohio sagged into overgrown trees and tripped.
- Three other transmission lines sagged into trees and switched off, forcing other power lines to shoulder the burden.
- Normally, the problem would have activated an alarm in the control room, but the alarm system failed.

2003 – The Great Northeast Blackout

U.S.-Canada Power System Outage Task Force

Final Report on the Implementation of the Task Force Recommendations

Natural Resources Canada
U.S. Department of Energy



Canada

September 2006

Task Force Recommendation

3. Implement

Group I: Institutional Related to Recommendations

Summary: In its Final Report, the Task Force addressed issues related to actions needed by the U.S. and Canada, and the Regulators, to make the mandatory and enforceable, and to provide appropriate penalties for non-compliance. The Task Force focused its first recommendation on this fundamental goal. The recommendation has five components:

Several of the 14 recommendations have more than one component. There are a total of 24 Group I components tracked. Fourteen of these components are fully implemented, and as the following table, substantial progress has been made on the remaining ten.

Table 3.1 summarizes the status of the implementation of each of the 24 components and identifies the entities responsible for implementing the recommendation. As noted previously, some of the recommendations involve discrete, one-time actions while others involve policies or actions that are to continue on an ongoing basis.

The following section describes the actions taken to implement each component of the Group I recommendations, and identifies any further actions planned to fully implement the recommendations.

⁶ Final Blackout Report, p. 141.

⁷ Energy Policy Act of 2005, Pub. L. No. 109-58 (2005).

⁸ Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of the Electric Reliability Standards (FERC Order No. 672), 114 FERC ¶ 61,104 (2006).

Final Report on the Implementation of Task Force Recommendations: Recommendation #1

Appropriate branches of government in the United States and Canada should **take action** as required to make reliability standards mandatory and enforceable, and to provide appropriate penalties for non-compliance.

Disturbances – The Change from Voluntary to Mandatory

- Before the current mandatory compliance with reliability standards, entities voluntarily adhered to "good utility practice."
- However, following three significant interconnection disturbances, voluntary adherence was no longer sufficient.



Energy Policy Act of 2005

- Federal Power Act, Section 215, calls for mandatory enforceable standards.
- FERC certifies an Electric Reliability Organization — the ERO (NERC).
- NERC may delegate authority to Regional Entities; e.g., WECC.
- Industry develops standards, approved by FERC.

One Hundred Ninth Congress of the United States of America

AT THE FIRST SESSION

*Begun and held at the City of Washington on Tuesday,
the fourth day of January, two thousand and five*

An Act

To ensure jobs for our future with secure, affordable, and reliable energy.

*Be it enacted by the Senate and House of Representatives of
the United States of America in Congress assembled,*

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) **SHORT TITLE.**—This Act may be cited as the “Energy Policy Act of 2005”.

(b) **TABLE OF CONTENTS.**—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—ENERGY EFFICIENCY

Subtitle A—Federal Programs

Sec. 101. Energy and water saving measures in congressional buildings.

Sec. 102. Energy management requirements.

Sec. 103. Energy use measurement and accountability.

Sec. 104. Procurement of energy efficient products.

Sec. 105. Energy savings performance contracts.

Sec. 106. Voluntary commitments to reduce industrial energy intensity.

Sec. 107. Advanced Building Efficiency Testbed.

Sec. 108. Increased use of recovered mineral component in federally funded projects involving procurement of cement or concrete.

Sec. 109. Federal building performance standards.

Sec. 110. Daylight savings.

Sec. 111. Enhancing energy efficiency in management of Federal lands.

Subtitle B—Energy Assistance and State Programs

Sec. 101. Low-income home energy assistance program.

Energy Policy Act of 2005 – Actual Section

TITLE XII—ELECTRICITY

SEC. 1201. SHORT TITLE.

This title may be cited as the “Electricity Modernization Act of 2005”.

Subtitle A—Reliability Standards

SEC. 1211. ELECTRIC RELIABILITY STANDARDS.

(a) IN GENERAL.—Part II of the Federal Power Act (16 U.S.C. 824 et seq.) is amended by adding at the end the following:

“SEC. 215. ELECTRIC RELIABILITY.

Electricity
Modernization
Act of 2005.
42 USC 15801
note.

16 USC 824o.

“(a) DEFINITIONS.—For purposes of this section:

“(1) The term ‘bulk-power system’ means—

“(A) facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof); and

“(B) electric energy from generation facilities needed to maintain transmission system reliability.

The term does not include facilities used in the local distribution of electric energy.

“(2) The terms ‘Electric Reliability Organization’ and ‘ERO’ mean the organization certified by the Commission under subsection (c) the purpose of which is to establish and enforce reliability standards for the bulk-power system, subject to Commission review.

“(3) The term ‘reliability standard’ means a requirement, approved by the Commission under this section, to provide for reliable operation of the bulk-power system. The term includes requirements for the operation of existing bulk-power system facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system, but the term does not include any requirement to enlarge such facilities or to construct new transmission capacity or generation capacity.

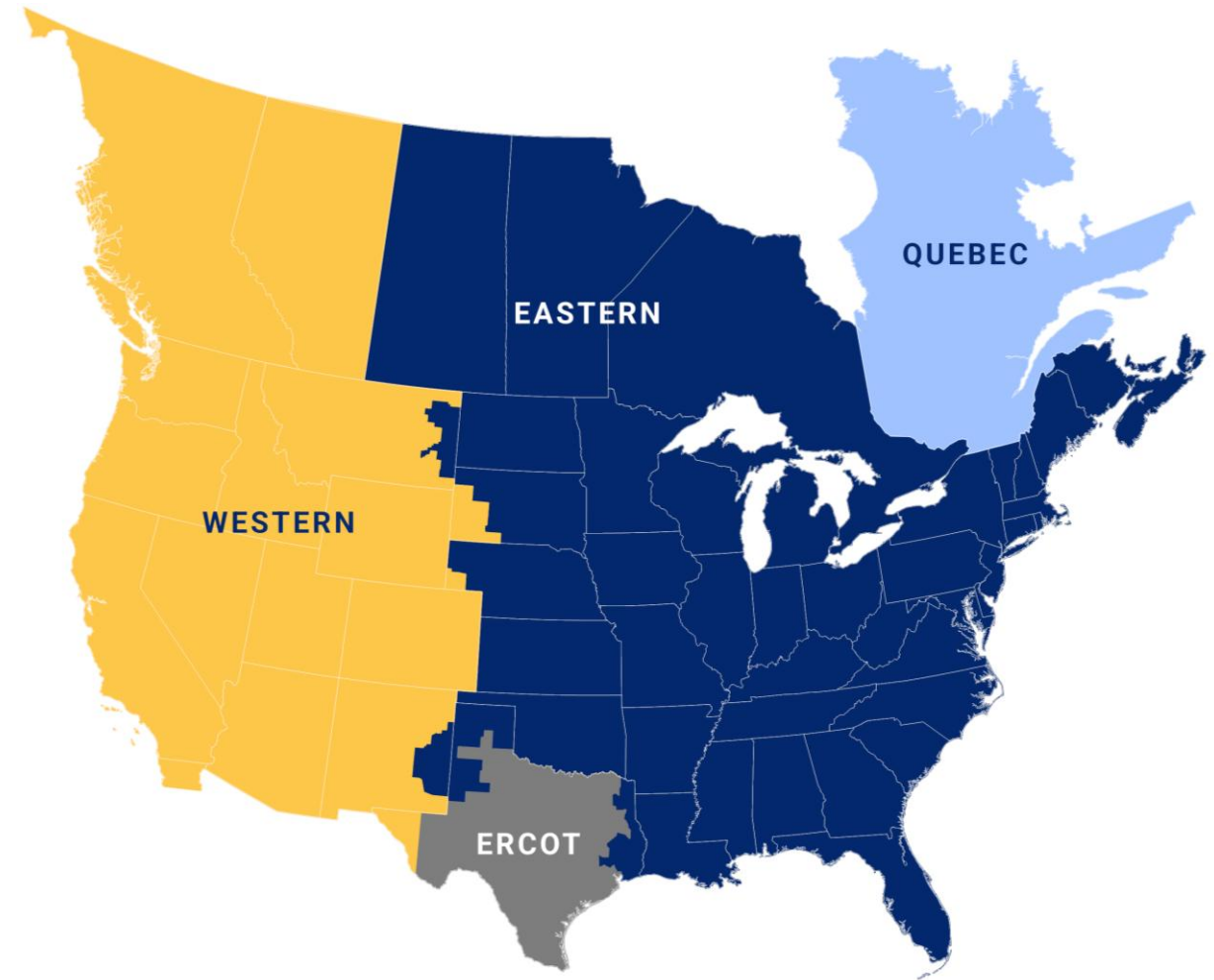
“(4) The term ‘reliable operation’ means operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.

- Title XXII – Electricity
- Subtitle A – Reliability Standards
- ~ Five pages of the 550-page Act

Regional Standards, Variances to NERC Standards, and Criteria

Regional Reliability Standards

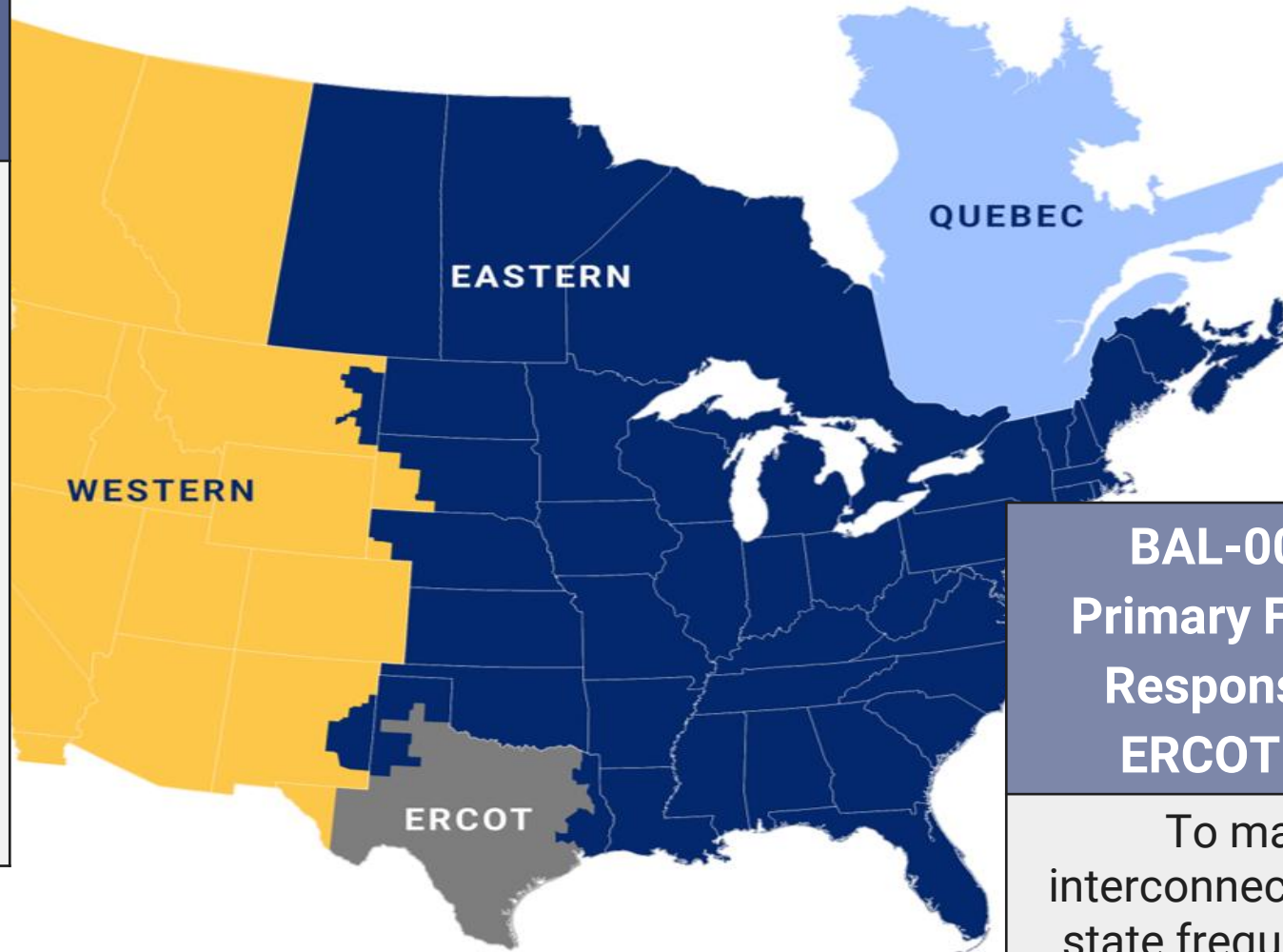
Regional Standards apply only in the interconnection for which the standard is designated. They are more stringent than continent-wide Standards, including a regional difference that addresses a unique risk or physical difference to that interconnection that the continent-wide Reliability Standard does not address.



Regional Standards, Variances to NERC Standards, and Criteria

FAC-501-WECC Transmission Maintenance

To ensure the Transmission Owner of a transmission path identified in Attachment B, Major WECC Transfer Paths in the BES, including associated facilities, has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

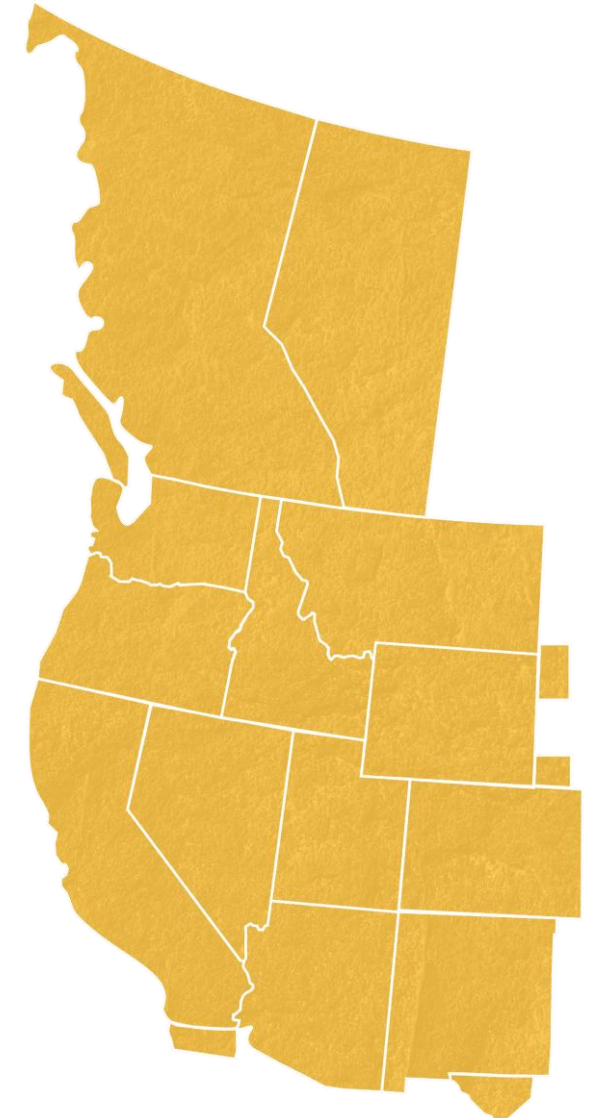


BAL-001-TRE Primary Frequency Response in the ERCOT Region

To maintain interconnection steady-state frequency within defined limits.

Regional Variances to NERC Standards

- Not inconsistent with or less stringent than the NERC Reliability Standard
- Necessitated by a physical difference
- An alternative methodology for same reliability objective
- **Not** already a Regional Standard



Sections of a Standard

BAL-005-1 – Balancing Authority Control

A. Introduction

1. **Title:** Balancing Authority Control
2. **Number:** BAL-005-1
3. **Purpose:** This standard establishes requirements for acquiring data necessary to calculate Reporting Area Control Error (Reporting ACE). The standard also specifies a minimum periodicity, accuracy, and availability requirement for acquisition of the data and for providing the information to the System Operator.
4. **Applicability:**
 - 4.1. **Functional Entities:**
 - 4.1.1. Balancing Authority

Effective Date: See Implementation Plan for BAL-005-1

B. Requirements and Measures

- R1. The Balancing Authority shall use a design scan rate of no more than six seconds in acquiring data necessary to calculate Reporting ACE. *[Violation Risk Factor: Medium]* *[Time Horizon: Real-time Operations]*
- M1. Each Balancing Authority will have dated documentation demonstrating that the data necessary to calculate Reporting ACE was designed to be scanned at a rate of no more than six seconds. Acceptable evidence may include historical data, dated archive files; or data from other databases, spreadsheets, or displays that demonstrate compliance.
- R2. A Balancing Authority that is unable to calculate Reporting ACE for more than 30-consecutive minutes shall notify its Reliability Coordinator within 45 minutes of the beginning of the inability to calculate Reporting ACE. *[Violation Risk Factor: Medium]* *[Time Horizon: Real-time Operations]*
- M2. Each Balancing Authority will have dated records to show when it was unable to calculate Reporting ACE for more than 30 consecutive minutes and that it notified its Reliability Coordinator within 45 minutes of the beginning of the inability to calculate Reporting ACE. Such evidence may include, but is not limited to, dated voice recordings, operating logs, or other communication documentation.
- R3. Each Balancing Authority shall use frequency metering equipment for the calculation of Reporting ACE: *[Violation Risk Factor: Medium]* *[Time Horizon: Real-time Operations]*
 - 3.1. that is available a minimum of 99.95% for each calendar year; and,
 - 3.2. with a minimum accuracy of 0.001 Hz.

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- **Title:** Provides the name and focus of standard.
- **Standard Number:** Abbreviation-**Number**-**Version**-**Errata**-**Interpretation** (i.e., CIP-**002**-**5**.**1a**)
- **Purpose:** Tells us why the standards was established. Gives us the reason that voters decided this was important to include in the compliance standard.
- **Applicability:** What functions must comply with the standard? Which Registered Entity functions are assigned these reliability requirements.

Sections of a Standard

BAL-005-1 – Balancing Authority Control

A. Introduction

1. **Title:** Balancing Authority Control
2. **Number:** BAL-005-1
3. **Purpose:** This standard establishes requirements for acquiring data necessary to calculate Reporting Area Control Error (Reporting ACE). The standard also specifies a minimum periodicity, accuracy, and availability requirement for acquisition of the data and for providing the information to the System Operator.
4. **Applicability:**
 - 4.1. **Functional Entities:**
 - 4.1.1. Balancing Authority

Effective Date: See Implementation Plan for BAL-005-1

B. Requirements and Measures

- R1. The Balancing Authority shall use a design scan rate of no more than six seconds in acquiring data necessary to calculate Reporting ACE. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- M1. Each Balancing Authority will have dated documentation demonstrating that the data necessary to calculate Reporting ACE was designed to be scanned at a rate of no more than six seconds. Acceptable evidence may include historical data, dated archive files; or data from other databases, spreadsheets, or displays that demonstrate compliance.
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- R3. Each Balancing Authority shall use frequency metering equipment for the calculation of Reporting ACE: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
 - 3.1. that is available a minimum of 99.95% for each calendar year; and,
 - 3.2. with a minimum accuracy of 0.001 Hz.

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- **Effective Date:** When does the entity need to be ready?
- **Requirements and Measures** — The requirements specify who shall do what under what conditions and the evidence needed to demonstrate compliance.
- **Other:** Compliance, Regional Variances, Interpretations, Associated Documents, Rationale

Sections of a Standard – Compliance

C. Compliance

1. Compliance Monitoring Process

1.1. 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.

1.2. Evidence Retention:

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.

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.

- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirements R1, R3, R5, R6 and R7, for three calendar years.
- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirement R4, Measure M4 for most recent 12 months of operator logs or most recent 3 months of voice recordings or transcripts of voice recordings, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
- If an applicable Transmission Owner or applicable Generator Owner is found non-compliant, it shall keep information related to the non-compliance until found compliant or for the time period specified above, whichever is longer.

1.3. Compliance Monitoring and Enforcement Program

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.

1.4. Additional Compliance Information

- CEA and CMEP generally boilerplate text. Evidence retention is critical when implementing a compliance-monitoring tool (e.g., Compliance Audit).
- Additional Compliance Information not used often. In FAC-003's case, a Periodic Data Submittal (PDS), a type of compliance monitoring tool, was implemented. Why? 2003 blackout!

Sections of a Standard — Regional Variances

PRC-006-5 — Automatic Underfrequency Load Shedding

D.B. Regional Variance for the Western Electricity Coordinating Council

The following Interconnection-wide variance shall be applicable in the Western Interconnection and replaces, in their entirety, Requirements R1 through R5, and R11 through R15.

As used in the RV, Planning Coordinator is specific to those Planning Coordinators providing Planning Coordinator service(s) to entities within the Western Interconnection, regardless of where the Planning Coordinator is located.

D.B.1. Each Planning Coordinator shall participate in a joint regional review with the other Planning Coordinators that develops and documents criteria, including consideration of historical events and system studies, to select portions of the Bulk Electric System (BES) that may form islands. *[VRF: Medium][Time Horizon: Long-term Planning]*

M.D.B.1. Each Planning Coordinator will have evidence such as reports, or other documentation of its criteria, developed as part of the joint regional review with other Planning Coordinators to select portions of the Bulk Electric System that may form islands including how system studies and historical events were considered to develop the criteria per Requirement D.B.1.

D.B.2. Each Planning Coordinator shall identify one or more islands from the regional review (per D.B.1) to serve as a basis for designing a Western Interconnection-wide coordinated UFLS program including: *[VRF: Medium][Time Horizon: Long-term Planning]*

D.B.2.1. Those islands selected by applying the criteria in Requirement D.B.1, and

D.B.2.2. Any portions of the BES designed to detach from the Western Interconnection (planned islands) as a result of the operation of a

- States which Requirements it is replacing.
- The WECC Regional Variance for PRC-006 allows for Planning Coordinators in the WECC footprint to participate in a coordinated plan and does not require that each has its own.

Sections of a Standard – Other

Appendix 1

Questions

Energy Sector Security Consortium, Inc. (EnergySec) submitted a Request for Interpretation (RFI) seeking clarification of Criterion 2.1 of Attachment 1 in Reliability Standard CIP-002-5.1 regarding the use of the phrase “shared BES Cyber Systems.”

The Interpretation Drafting Team identified the following questions in the RFI:

1. Whether the phrase “shared BES Cyber Systems” means that the evaluation for Criterion 2.1 shall be performed individually for each discrete BES Cyber System at a single plant location, or collectively for groups of BES Cyber Systems?
2. Whether the phrase “shared BES Cyber Systems” refers to discrete BES Cyber Systems that are shared by multiple units, or groups of BES Cyber Systems that could collectively impact multiple units?
3. If the phrase applies collectively to groups of BES Cyber Systems, what criteria should be used to determine which BES Cyber Systems should be grouped for collective evaluation?

Responses

Question 1: Whether the phrase “shared BES Cyber Systems,” means that the evaluation for Criterion 2.1 shall be performed individually for each discrete BES Cyber System at a single plant location, or collectively for groups of BES Cyber Systems?

The evaluation as to whether a BES Cyber System is shared should be performed individually for each discrete BES Cyber System. In the standard language of CIP-002-5.1, there is no reference to or obligation to group BES Cyber Systems. Requirement R1, part 1.2 states “Identify *each* of the medium impact BES Cyber Systems according to Attachment 1, Section 2...” Further, the preamble of Section 2 of CIP-002-5.1 Attachment 1 states “*Each BES Cyber System*...associated with any of the following [criteria].” (emphasis added)

Additionally, the Background section of CIP-002-5.1 states that “[i]t is left up to the Responsible Entity to determine the level of granularity at which to identify a BES Cyber System within the qualifications in the definition of BES Cyber System.” The Background section also provides:

The Responsible Entity should take into consideration the operational environment and scope of management when defining the BES Cyber System boundary in order to maximize efficiency in secure operations. Defining the boundary too tightly may result in redundant paperwork and authorizations, while defining the boundary too broadly could make the secure operation of the BES Cyber System difficult to monitor and assess.

- Interpretations
- Supplemental reference Documents
- Version History
- Tables/Attachments

Who Must Comply?



Rules of Procedure

Effective: November 28, 2023

The NERC ROP Section 300 addresses the requirements for developing Reliability Standards. Specifically, the language states:

“NERC shall develop and maintain Reliability Standards that apply to Bulk Power System owners, operators, and users and that enable NERC and Regional Entities to measure the reliability performance of Bulk Power System owners, operators, and users; and to hold them accountable for Reliable Operation of the Bulk Power Systems.”

NERC Registered Entities

	Entities that Must Register	Entities that Need to be Certified
Reliability Coordinator (RC)	√	√
Transmission Operator (TOP)	√	√
Balancing Authority (BA)	√	√
Planning Authority/Planning Coordinator (PA/PC)	√	
Transmission Planner (TP)	√	
Transmission Service Provider (TSP)	√	
Transmission Owner (TO)	√	
Resource Planner (RP)	√	
Distribution Provider (DP)	√	
Generator Owner (GO)	√	
Generator Operator (GOP)	√	
Reserve Sharing Group (RSG)	√	
Frequency Response Sharing Group (FRSG)	√	
Regulation Reserve Sharing Group	√	

NERC Entity Functions

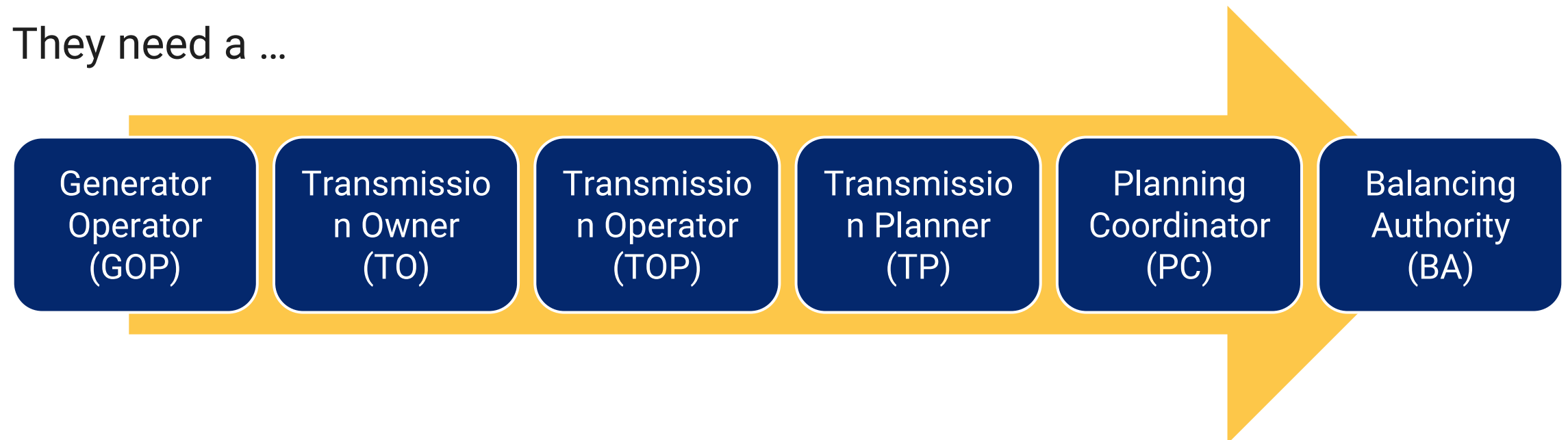
Electric utility tasks...

- Generate, transmit power, plan, coordinate

Example:

A company wants to build a new generator. They become a Generator Owner (GO).

They need a ...



NERC Entity Functions

- Balancing Authorities (BA)
- Distribution Providers (DP)
- Generator Operators (GOP)
- Generator Owners (GO)
- Planning Coordinator (PC)
- Transmission Operators (TOP)
- Transmission Owners (TO)
- Transmission Planner (TP)
- Transmission Service Provider (TSP), etc.

FAC-003-4 Transmission Vegetation Management

A. Introduction

1. **Title:** Transmission Vegetation Management
2. **Number:** FAC-003-4
3. **Purpose:** To maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.
4. **Applicability:**
 - 4.1. **Functional Entities:**
 - 4.1.1. Applicable Transmission Owners
 - 4.1.1.1. Transmission Owners that own Transmission Facilities defined in 4.2.
 - 4.1.2. Applicable Generator Owners
 - 4.1.2.1. Generator Owners that own generation Facilities defined in 4.3.
 - 4.2. **Transmission Facilities:** Defined below (referred to as “applicable lines”), including but not limited to those that cross lands owned by federal¹, state, provincial, public, private, or tribal entities:
 - 4.2.1. Each overhead transmission line operated at 200kV or higher.
 - 4.2.2. Each overhead transmission line operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator.
 - 4.2.3. Each overhead transmission line operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

NERC Mandatory Standards Subject to Enforcement

Acronym	Title	# of Standards
BAL	Resource and Demand Balancing	9
CIP	Critical Infrastructure Protection	13
COM	Communications	2
EOP	Emergency Preparedness and Operations	7
FAC	Facilities Design, Connection, and Maintenance	7
INT	Interchange Reliability Operations and Coordination	2
IRO	Interconnection Reliability Operations and Coordination	12
MOD	Modeling, Data, and Analysis	6
NUC	Nuclear	1
PER	Personnel Performance, Training, and Qualifications	3
PRC	Protection and Control	20
TOP	Transmission Operations	6
TPL	Transmission Planning	3
VAR	Voltage and Reactive	3

Standards O&P and CIP

Operations & Planning Standards

NERC 693 Reliability Standards define the reliability requirements for operating and planning the North American BPS.

Based on FERC Order No. 693,
issued March 16, 2007

Critical Infrastructure Protection (CIP) Standards

NERC 706 Reliability Standards define the reliability requirements for CIP of the North American BPS.

Based on FERC Order No. 706,
issued January 18, 2008

Performance-based Requirements

Define a specific reliability objective or outcome achieved by one or more entities that has a direct, observable effect (i.e., an effect that can be measured using power system data or trends) on the reliability of the BPS. A performance-based requirement has four components: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome.

Application	Measures
• Defined Performance Targets • Should be observable and measurable on the bulk power system. • The reliable outcome is what is being measured.	• Periodic reporting of system data/results • System testing/simulation • Event-triggered response data/analysis

Performance-based Requirements

Auto

The posted speed limits requiring drivers to operate vehicles at or under what is determined to be a safe operating speed.

O&P

“Each Transmission Owner shall prevent vegetation from encroaching within the Minimum Vegetation Clearance Distance (MVCD).”

CIP

“Issue an alarm or alert in response to detected unauthorized access through a physical access point into a Physical Security Perimeter to the personnel identified in the BES Cyber Security Incident response plan within 15 minutes of detection.”

Risk-based Requirements

Define actions by one or more entities that reduce a stated risk to the reliability of the BPS and that can be measured by evaluating a particular product or outcome resulting from the required actions. A risk-based reliability requirement should be framed as: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the BPS.

Application	Measures
• Necessary when consequences of failure or performance-based measures are too costly • Based on defined risk strategies and objectives	• Bulk power system performance trends • Defined risk targets achieved • Performance records, logs, interviews, etc.

Risk-based Requirements

Auto

Automobile safety inspections are a risk-based standard in that they ask auto owner to annually inspect the vehicle to ensure they are safe to operate.

O&P

“Each Transmission Owner shall perform a Vegetation Inspection of all applicable transmission lines at least once per calendar year.”

CIP

“At least once every 35 calendar days, evaluate security patches for applicability that have been released since the last evaluation from the source or sources identified in Part 2.1.”

Capability-based Requirements

Define capabilities needed by one or more entities to perform reliability functions and that can be measured by demonstrating the capability exists as required. A capability-based reliability requirement should be framed as: who, under what conditions (if any), shall have what capability, to achieve what particular result or outcome to perform an action to achieve a result or outcome or to reduce a risk to the reliability of the BPS.

Application	Measures
• Tools and training • Communications and analysis equipment • Backup facilities	• Observe/test functionality • Certifications, qualifications • Records, logs, etc.

Capability-based Requirements

Auto

Drivers' licenses are a form of a capability-based requirement because the auto operator must demonstrate the knowledge needed to safely operate an auto.

O&P

"Each Transmission Owner shall document the procedures, processes, or specifications it uses to prevent the encroachment of vegetation into the MVCD."

CIP

"Require completion of the training specified in Part 2.1 prior to granting authorized electronic access and authorized unescorted physical access to applicable Cyber Assets, except during CIP Exceptional Circumstances."

Reading Requirements vs. Measures

Requirement	Measure
Calls for document	Require the responsible entity to provide that document
Calls for document having timing-related aspects such as “current” or “updated”	Evidence must include references to dates
Is to verify something	Include the criteria for verification and the evidence to support that the verification was conducted
Is for verification to be executed on some periodic basis	Evidence must include references to dates
Is to take an action	Include evidence that the action was performed
Is for action under specified conditions or with some specified frequency	Include evidence of the conditions under which the action was performed or a reference to the times when action took place, to support the frequency

Reading Requirements vs. Measures

B. Requirements and Measures

- R1.** Each applicable Transmission Owner and applicable Generator Owner shall manage vegetation to prevent encroachments into the Minimum Vegetation Clearance Distance (MVCD) of its applicable line(s), operating within their Rating and all Rated Electrical Operating Conditions of the types shown below⁴ [*Violation Risk Factor: High*] [*Time Horizon: Real-time*]:
- 1.1.** An encroachment into the MVCD as shown in FAC-003-Table 2, observed in Real-time, absent a Sustained Outage,⁵
 - 1.2.** An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,⁶
 - 1.3.** An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage,⁷
 - 1.4.** An encroachment due to vegetation growth into the MVCD that caused a vegetation-related Sustained Outage.⁸
- M1.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R1. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R1)

Requirement Language
(Performance-based)

Measure Language

Differences Between a Requirement and a Measure

Reliability Standards give the “What” and the “When” but do not explicitly dictate the “How”

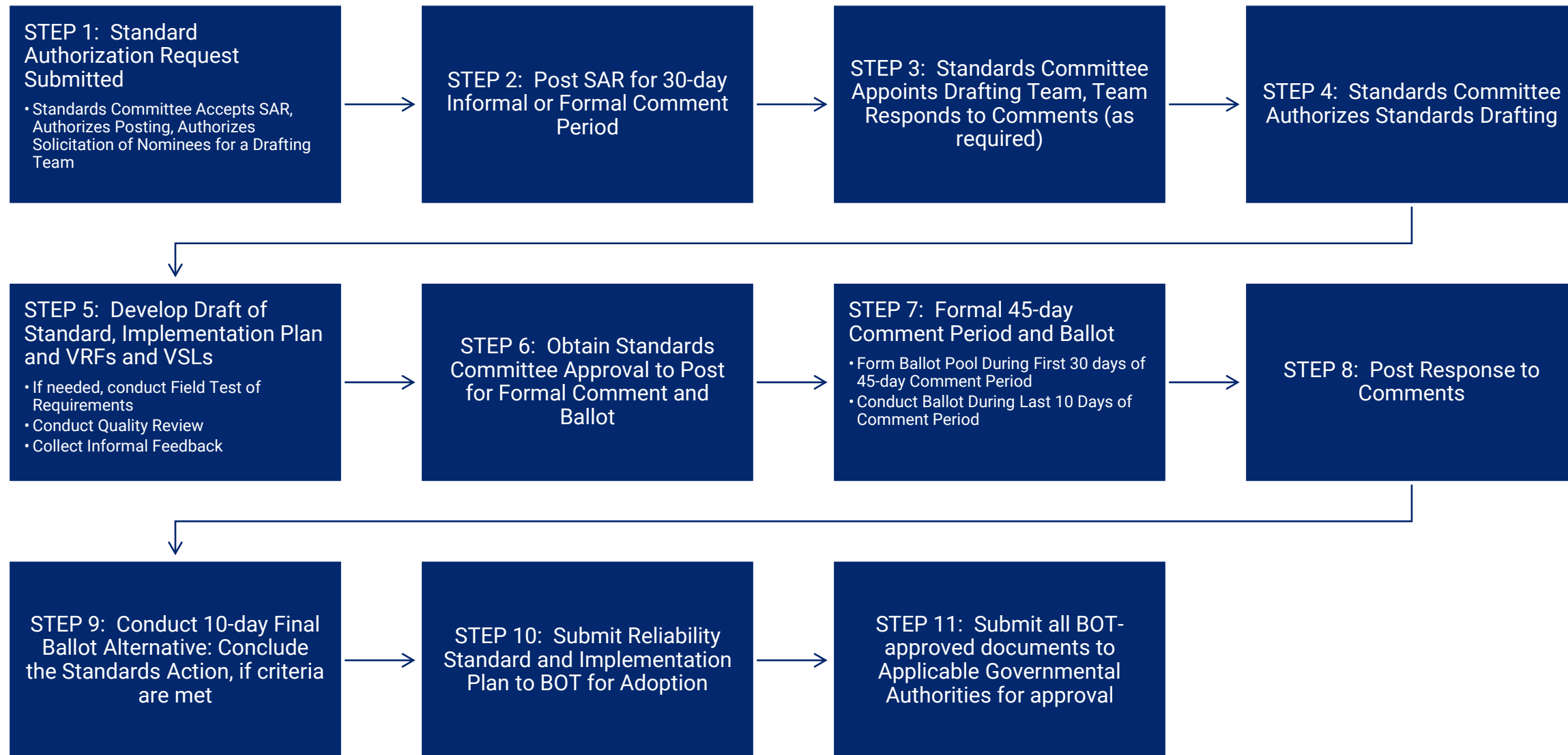
Requirement

- Mandatory
- Enforceable

Measure

- Example
- How might compliance be shown?

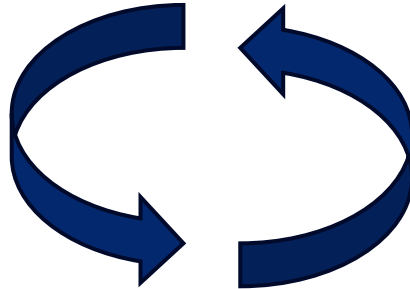
NERC Process Steps





WECC Process Steps

- 1 – Submit and validate a standard authorization request
- 2 – Complete SAR and present to the WSC
- 3 – WSC solicits and seats drafting team members
- 4 – Convene the drafting team
- 5 – Drafting phase
- 6 – Post for comment
- 7 – Respond to comments
- 8 – Submit proposed draft to the WSC with a request for ballot
- 9 – Convene a Standards briefing
- 10 – Form the ballot pool and ballot the Standard
- 11 – WSC approves and forwards to the board
- 12 – Obtain board approval



Steps 1 and 2 – SAR



Any person or entity may submit a SAR.

The SAR identifies the need, scope, affected parties, and requirements of the proposed project.



The Standards Committee reviews the SAR for completeness and scope.



Once deemed complete and within WECC's/NERC's authority, the SAR is presented to the Standards Committee for disposition.

Steps 1 and 2 – SAR

To be accepted by the Standards Committee, the SAR must:

- Contain a description of the requested action
- Define purpose, scope, affected parties, and any other relevant information
- Must be within WECC's/NERC's scope

Steps 3–8 – Drafting Team

- Notice sent to the public via email distribution list, WECC Weekly, and other outreach events
 - Drafting team nominees are volunteers and SMEs
 - Looking for 5–12 volunteers
- WECC vets the nominees and puts a recommended slate together
- Standards Committee approves the drafting team



What is the Role of the Drafting Team?



What do WECC staff and the WSC **do**?

WSC guides and oversees the Standards Development Process

WECC staff guides drafting teams and ensures adherence to process, procedures, and best practices



What does the drafting team **do**?

Drafts proposed language for the Reliability Standards, definitions, Variances, and/or Interpretations and associated implementation plans.

Develops and refines technical documents that aid in the understanding of Reliability Standards.

Solicits, considers, and responds to comments related to the specific Reliability Standards development project.

Participates in industry forums to help build consensus on the draft Reliability Standards, definitions, Variances, and/or Interpretations and associated implementation plans.

What is the Role of the Drafting Team?



What does WECC staff and the WSC **NOT DO?**

Write the Standards
Approve the Standards



What does the drafting team **NOT DO?**

Approve the Standards

Who Can be Part of a Drafting Team?

From the Standards Process Manual at NERC:

Each drafting team may consist of a group of technical, legal, and compliance experts that work cooperatively with the support of the Standards staff.

The technical experts provide the subject matter expertise and guide the development of the technical aspects of the Reliability Standard, assisted by technical writers, legal and compliance experts.

The technical experts maintain authority over the technical details of the Reliability Standard.



What are the Roles of DT Members?

The Chair

- Because the DT chair's primary responsibility is leadership and coordination, the DT chair need not be a SME in the field associated with the SAR. (Usually they are, though)
- Helps to build consensus
- Keeps team moving forward in the right direction

Team Members

- Draft the proposed language
- Vote on sending drafts out for comment
- Respond and incorporate comments
- Help with outreach
- Vote to send completed drafts to WSC for ballot

Who Can Attend DT Meetings and Participate?

- Anyone and everyone
- The meetings **must** be publicly noticed and accessible



Balloting and Voting Process

- NERC Standards Balloting and Voting Process
 - All NERC Standards and Variances developed through the NERC ROP and SPM
 - Comment/ballot are together
 - Anyone Interested Can Comment
 - Members of the NERC Registered Ballot Body that join the associated Ballot Pool
 - Final ballots – When/Why
- WECC Standards Balloting and Voting Process
 - All Regional Standards, Variances to NERC Standards, and Regional Criteria developed using the WECC RSDP Process
 - Comment periods
 - Ballot periods
 - Anyone Interested Can Comment
 - Members of the WECC Registered Ballot Body that join the associated Ballot Pool
 - What goes to NERC/FERC and What goes just to the WECC board?

Who Can Comment and Vote?

- **Who Can Comment on Standards During the Process?**

- Everyone
- “Comments in written form may be submitted on a draft Reliability Standard by any interested stakeholder, including NERC Staff, FERC Staff, and other interested governmental authorities. If stakeholders disagree with some aspect of the proposed set of products, comments provided should explain the reasons for such disagreement and, where possible, suggest specific language that would make the product acceptable to the stakeholder.”

- **Who Can Vote in a Ballot?**

- All members of the Registered Ballot Body are eligible to join each ballot pool to vote on a new or revised Reliability Standard and its implementation plan.

Balloting the Standard

- Once the drafting team believes no additional revisions are necessary, it seeks approval from the Standards Committee to ballot the Standard.
- A ballot pool is formed from members of the ballot body.
 - The WECC ballot body is made up of entities who have registered with WECC to vote on WECC Standards and Criteria and who have been vetted by WECC as eligible.
 - The ballot pool is stakeholders from the ballot body interested or affected by the proposed Standard or Criterion.
 - Each ballot pool is formed individually.



Balloting the Standard

- If a standard or criterion passes the ballot, the WSC sends it to the board and it will be presented to the WECC board for approval at its next meeting
 - The ballot results and supporting documents are provided.
- If the board approves a Regional Criterion, it will become effective in accordance with the associated implementation plan.
- If the WECC board approves a WECC Regional Reliability Standard or a WECC variance to a NERC Reliability Standard, it is filed with NERC for NERC board adoption.



NERC and WECC Process Differences

- NERC
 - Requires team to be formed and solicit/respond to comments on SAR
 - Comment and ballots are tied together
 - Drafting teams must seek authorization for posting
 - Comment periods are 45 days, with the ballot opening the last 10 days
 - If draft passes a ballot, it must go out for a final ballot*
- WECC
 - SAR does not go out for industry comment once accepted by WSC
 - Postings for comment are independent of balloting and a minimum of 30 days
 - DT does not need authorization to post for comment
 - WSC must authorize a project to be balloted
 - Ballots are a minimum of 14 days
 - If draft passes ballot, it is taken to WSC for acceptance and forwarding to the board

FERC Approval Process



If the NERC board adopts the document, NERC prepares a joint filing from NERC and WECC to FERC for consideration.



FERC may *approve*, *approve AND direct further action*, or *remand* the document.



If FERC approves the Standard, it becomes effective as outlined in the implementation plan.



Once effective, it becomes mandatorily enforceable with potential monetary sanctions for noncompliance.



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