

**NERC**

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# Cyber Security – Security Management Controls

Technical Rationale and Justification for  
Reliability Standard CIP-003-X

~~August 2021~~ February 2022

RELIABILITY | RESILIENCE | SECURITY



3353 Peachtree Road NE  
Suite 600, North Tower  
Atlanta, GA 30326  
404-446-2560 | [www.nerc.com](http://www.nerc.com)

# Table of Contents

---

Preface .....	iii
Introduction .....	<b>Error! Bookmark not defined.</b>
Background.....	<b>Error! Bookmark not defined.</b>
Technical Rational for Reliability Standard CIP-003-X.....	4
Introduction.....	4
Preface .....	iii
Technical Rational for Reliability Standard CIP-003-X.....	4
Introduction.....	4
Background.....	4
Foreword Regarding Section 3 and Section 6 .....	4
Rationale Section 6 of Attachment 1 (Requirement R2).....	5
Attachment 1 Section 6 Part 6.1 – Determining Vendor Remote Access .....	5
Attachment 1 Section 6 Part 6.2 – Disabling vendor remote access .....	6
Attachment 1 Section 6 Part 6.3 – Detecting known or suspected malicious communications for both inbound and outbound communications .....	6

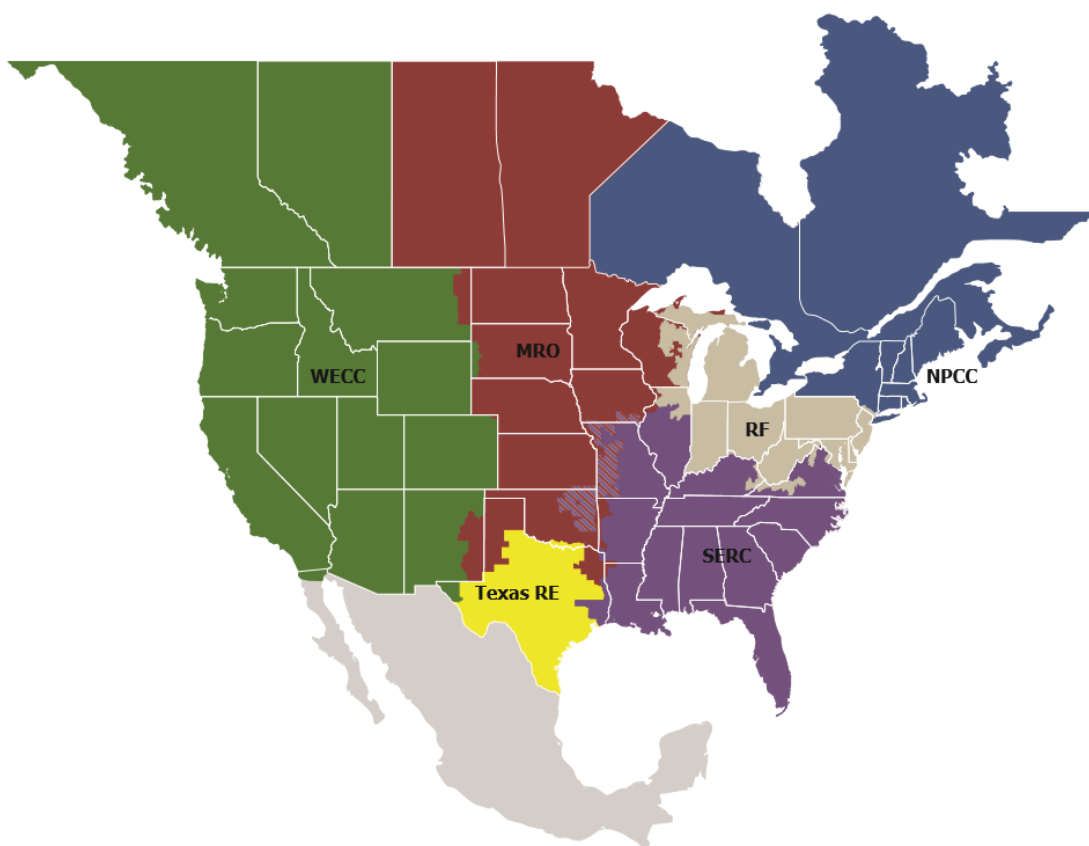
# Preface

---

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the six Regional Entities (REs), is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

Reliability | Resilience | Security  
*Because nearly 400 million citizens in North America are counting on us*

The North American BPS is divided into six RE boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one RE while associated Transmission Owners (TOs)/Operators (TOPs) participate in another.



<b>MRO</b>	Midwest Reliability Organization
<b>NPCC</b>	Northeast Power Coordinating Council
<b>RF</b>	ReliabilityFirst
<b>SERC</b>	SERC Reliability Corporation
<b>Texas RE</b>	Texas Reliability Entity
<b>WECC</b>	WECC

# Technical Rationale for Reliability Standard CIP-003-X

---

## Introduction

This document explains the technical rationale and justification for the proposed Reliability Standard CIP-003-X. It provides stakeholders and the ERO Enterprise with an understanding of the technology and technical requirements in the Reliability Standard. This Technical Rationale and Justifications for CIP-003-X is not a Reliability Standard and should not be considered mandatory and enforceable.

Updates to this document now include the Project 2020-03 – Supply Chain Low Impact Revisions Standards Drafting Team (SDT) intent in drafting changes to the requirement.

## Background

In its final report accepted by the NERC Board in May 2019, NERC documented the results of the evaluation of supply chain risks associated with certain categories of assets not currently subject to the Supply Chain Standards and recommended actions to address those risks. NERC staff recommended further study to determine whether new information supports modifying the standards to include low impact BES Cyber Systems with external connectivity by issuing a request for data or information pursuant to Section 1600 of the NERC Rules of Procedure.

The Board approved the formal issuance of this data request on August 15, 2019. NERC collected the data from August 19 through October 3, 2019. A final report, *Supply Chain Risk Assessment*, was published in December 2019. The report recommended the modification of the Supply Chain Standards to include low impact BES Cyber Systems with remote electronic access connectivity. Further, industry feedback was received regarding this recommendation at the February 2020 NERC Board meeting through MRC Policy Input.

After considering policy input, the NERC Board adopted a resolution to initiate a project to modify Reliability Standard CIP-003-8 to include policies for low impact BES Cyber Systems to: (1) detect known or suspected malicious communications for both inbound and outbound communications; (2) determine when active vendor remote access sessions are initiated; and (3) disable active vendor remote access when necessary.

## **Foreword Regarding Section 3 and Section 6**

When developing the standards language, the SDT reviewed and proposed multiple language options to clarify the requirements of electronic remote vendor access in context of existing Section 3 electronic access controls. In addition, the SDT considered process considerations, remote and electronic access, remote access architectures and technologies, and data paths communications protocols. The SDT discussed systems used for electronic access, remote vs local electronic access, vendor access accounts and privileges, and optimal time frames for establishing, identifying, determining and disabling or terminating vendor electronic access.

The SDT agreed to retain Section 3 and establish Section 6 to address vendors and low impact electronic remote access, as well as malicious inbound and outbound data communications which may be sourced from or transmitted to vendors. The SDT recognized that some entities may use the same process, system and/or technology (for vendor electronic access) that is used by entity personnel, or cases where entities use disparate processes, systems or technologies to manage vendor electronic access. The SDT also discussed systems and cyber assets owned by vendors but authorized for use on entity networks vs systems and cyber assets owned by entities but used by vendors for electronic remote access.

Given these multiple considerations the SDT established Section 6 to specifically address electronic vendor remote access and inbound/outbound malicious communications for low impact. The language requires an entity to develop and implement a process or processes for identifying electronic vendor remote access, having a method or methods

for disabling electronic vendor remote access, as well as methods to detect known or suspicious vendor inbound and outbound malicious communications.

The language gives entities the flexibility to define processes to identify and manage electronic vendor remote access for their specific policies, processes, systems, configurations, organizations, operations, and Facilities. The language allows entities to define how and where electronic vendor remote access occurs and the ideal methods and timeframes to authorize, establish and disable electronic vendor remote access. Entities may choose to define systems, applications and/or configurations used by vendors, accounts and privileges, network data communication paths or physical processes for establishing and disabling electronic vendor remote communications. Section 6 provides the flexibility to meet many types of vendor electronic remote access configurations while managing vendor remote access risks.

## Rationale Section 6 of Attachment 1 (Requirement R2)

Requirement R2 mandates that entities develop and implement one or more cyber security plan(s) to meet specific security objectives for assets containing low impact BES Cyber System(s). In February 2020, the NERC Board approved the initiation of a project to modify Reliability Standard CIP-003-8 to include policies for low impact BES Cyber Systems to: (1) detect known or suspected malicious communications for both inbound and outbound communications; (2) determine when active vendor remote access sessions are initiated; and (3) disable active vendor remote access when necessary.

As published in the December 2019 NERC Report: [Supply Chain Risk Assessment – Analysis of Data Collected under the NERC Rules of Procedure Section 1600 Data Request](#), of the 87% of section 1600 data request respondents with low impact BES Cyber Systems approximately ~~6766%~~ have external connectivity which often results in the allowance of ~~3<sup>rd</sup> party access external connectivity~~. As our grid has grown more complex, the use of ~~third external~~ parties to support and maintain low impact BES Cyber Systems, equipment and facilities is expected; However, the prevalence of external connectivity ~~and 3<sup>rd</sup> party access, herein referred to as vendor<sup>1</sup> remote access~~, across low-impact BES systems could pose a significant impact to the reliability of the grid through the potential of a common supply chain vulnerability. To address this vulnerability, the originating FERC Order<sup>2</sup>, and the resulting NERC Board resolution<sup>3</sup>, the proposed Attachment 1 Section 6, as it relates to the existing Requirement 2, mandates that applicable entities develop, document, and implement a process to mitigate the risks associated with malicious communications and ~~vendor remote access. This includes systems used by vendors for system-to-system remote access and vendor Interactive Remote Access (IRA) to low impact BES Cyber Systems.~~electronic vendor remote access.

## Attachment 1 Section 6 Part 6.1 – Determining Vendor Remote Access

The objective of Attachment 1 Section 6.1 is for entities to have visibility of electronic vendor remote access ~~sessions (including interactive remote access and system-to-system) that are taking place~~ on their low impact BES Cyber Systems. Such visibility increases an ~~entities~~entity's ability to ~~rapidly~~ detect, respond and resolve issues that may originate with or be tied to a particular vendor's electronic remote access ~~session~~. The obligation in Section 6.1 requires that entities have a method to determine active electronic vendor remote access ~~sessions, R2 requires that said method be documented and implemented.~~

<sup>1</sup> Similar to [CIP-013](#), the term *vendor(s)*, as used in the standard, is limited to those persons, companies, or other organizations with whom the Responsible Entity, or its affiliates, contract with to supply BES Cyber Systems and related services. It does not include other NERC registered entities providing reliability services (e.g., Balancing Authority or Reliability Coordinator services pursuant to NERC Reliability Standards). A *vendor*, as used in the standard, may include: (i) developers or manufacturers of information systems, system components, or information system services; (ii) product resellers; or (iii) system integrators.

<sup>2</sup> Order No. 829, Revised Critical Infrastructure Protection Reliability Standards, 156 FERC ¶ 61,050 (2016).

<sup>3</sup> Resolution-Supply Chain Recommendations - Board Approved - February 6, 2020 ([LINK](#))

~~In support of Attachment 1 Section 6.3, and in line with FERC Order No. 829 (p.49), increased vendor remote access visibility may give Responsible Entities the ability to rapidly disable remote access sessions in the event of a system breach.~~

## ~~Attachment 1 Section 6 Part 6.2 – Detecting known or suspected malicious communications for both inbound and outbound communications~~ Disabling vendor remote access

~~The objective of Attachment 1 Section 6.2 is for entities to have the ability to detect known or suspected malicious communications such that the entity may respond to and remediate resulting impacts. The obligation in Section 6.2 requires that entities which allow vendor remote access (including interactive remote access) must establish a process/procedure to detect malicious communications from vendors and the systems used by vendors to access low impact BES Cyber Systems. R2 requires that these methods be documented and implemented.~~

## ~~Attachment 1 Section 6 Part 6.3 – Disabling vendor remote access~~

~~The objective of Attachment 1 Section 6.3 is for entities to have the ability to disable active remote access sessions in the disable electronic vendor remote access in the event of a security event of a system breach as specified in Order No. 829 (P. 52). Per FERC Order 829 (p.49),<sub>z</sub> the inability of a responsible entity to rapidly terminate a connection may allow malicious or otherwise inappropriate communication to propagate, contributing to a degradation of a BES Cyber Asset’s function. Enhanced visibility into electronic vendor remote communications access and the ability to rapidly terminate aelectronic vendor remote communication access could mitigate such a vulnerability. The obligation in Section 6.3<sub>2</sub> requires that entities have a method to disable activeelectronic vendor remote access sessions, R2.~~

## ~~Attachment 1 Section 6 Part 6.3 – Detecting known or suspected malicious communications for both inbound and outbound communications~~

~~The objective of Attachment 1 Section 6.3 is for entities to have the ability to detect known or suspected malicious communications by vendors, such that the entity may respond to and remediate resulting impacts. This sub part is scoped to focus only on vendors’ communications per the NERC Board resolution and the supply chain report. The obligation in Section 6.3 requires that ~~said method(s)~~ entities must establish a method(s) to detect known or suspected malicious communications from vendors and the systems used by vendors to communicate with low impact BES Cyber Systems.~~

~~Current Requirements in CIP-003-8 R2 that govern direct electronic communications with low impact BES Cyber Systems are not as robust as those in CIP-005-6 that govern high impact BES Cyber Systems and medium impact BES Cyber Systems. Security controls such as use of intermediate systems and multi-factor authentication provide high impact BES Cyber Systems and medium impact BES Cyber Systems additional security from malicious communication and overall access controls. In addition to Intermediate Systems and multi-factor authentication, high impact BES Cyber Systems and medium impact BES Cyber Systems at Control Centers have requirements to detect malicious communications at the Electronic Access Points of those systems. These security measures are not required at low impact BES Cyber Systems.~~

~~In keeping with the NERC stated risk-based model, there may be documented and implemented, a scenario where a vendor directly communicates with a Low impact BES Cyber System. In the event that this connection may be compromised, the inclusion of security Requirements to detect malicious communications under CIP-003-X Attachment 1 Section 6 would provide entities visibility and opportunity in detecting and mitigating risks posed by vendor communications.~~