Standards Development Reference Document

I. Standards Under Development – Currently Posted

For additional detail about standards under development, see Section III.

Project	Action	End Date
None currently		

II. Recent/Relevant Comment Periods and Ballots

Project	Action	End Date
Draft 2021-2023 Reliability Standards Development Plan	Comment Period	9/9/2020
2019-03 Cyber Security Supply Chain Risks	Additional Ballot and Comment Period	9/10/2020
2019-02 BCSI Access Management	Additional Ballot and Comment Period	9/21/2020

III. Standards Under Development - Additional Detail

This section includes those projects that are in the SAR Phase to NERC filing the petition with FERC. Once FERC issues a final rule, the project is removed from this table.

Project	Background	Dates/Actions

2015-09 Establish and Communicate System Operating Limits | FAC-010-3 FAC-011-3 FAC-014-2 FAC-015-1	The project will revise the requirements for determining and communicating SOLs and IROLs to address the issues identified in Project 2015-03 Periodic Review of System Operating Limit Standards. The resulting standard(s) and definition(s) will benefit reliability by improving alignment with approved TPL and proposed TOP and IRO standards. The project may result in development of one or more proposed Reliability Standards and definitions.	8/26/2020 Additional Ballots, Initial Ballots, Comment Period CIP-014-3 60.65% FAC-003-5 90.87% FAC-011-4 75.58% FAC-013-3 90.28% FAC-014-3 67.21% PRC-002-3 91.31% PRC-023-5 90.75% PRC-026-2 91.45% TOP-001-6 84.45% IRO-008-3 84.21% Implementation Plan 55.98% 10/17/2018 Ballots CIP-014-3 67.65% FAC-003-5 67.46% FAC-011-4 53.22% FAC-013-3 77.7% FAC-014-3 59.02% FAC-015-1 59.79% PRC-002-3 75.07% PRC-023-5 69.27% PRC-026-2 71.98% Implementation Plan 69.93% SOL Definition 82.26% 11/13/2017 Initial Ballot FAC-011-4: 58.12% FAC-014-3: 63.17% FAC-015-1: 56.55% IP: 76.40% System Voltage Limit Definition: 68.59%

		10/30/2017 Informal Comment Period on definitions (SOL and SOL Exceedance) 8/12/2016 Comments (FAC-011 and FAC-014) 9/21/15 SAR Comments

2016-02 Modifications to CIP Standards | Virtualization	The CIP standards are based primarily on concepts dating back to Version 1 and as technology has evolved, issues have begun to arise as entities attempt to take new concepts and fit them into some of the Version 1 paradigms. These issues revolve around topics such as: • Hypervisor – the virtualization component that manages the guest operating systems (OSs) on a host and controls the flow instructions between the guest OSs and the physical hardware. • Virtual machines – With virtualization technologies, a single physical Cyber Asset can be used as an execution platform for numerous virtualized operating systems, micro-service containerized applications, and virtual network functions of all classifications. A single physical Cyber Asset can appear to an external network as many complete Cyber Assets. Virtual switches and networks can be defined so these virtual machines can communicate with each other as if they are separate physical nodes on the network. Virtual machines and functions can also migrate around a physically clustered cyber system such that the singular physical Cyber Asset where an application resides can change at any moment. The virtualization of Cyber Assets provides advantages for the availability, resiliency, and reliability of applications and functions hosted in such an environment and the CIP standards must not stand in the way of these benefits as long as they are implemented in a secure manner. Virtualization affords enhanced security in some cases as the security controls themselves can be virtualized and placed within the virtual environment closer to the workloads they are protecting. However, there are also different security risks introduced by these environments. The management systems or consoles for these environments allow for the complete control of numerous components of the infrastructure. Virtual machines or networks can be added, modified, or deleted from one central management system. For example, rogue virtual components can starve legitimate workloads of the shared resources (processor, memory, etc.) they need to reliably perform their function. In summary, changes to the CIP Requirements may be needed to account for virtualization. • Virtual Networks – Electronic Security Perimeter (ESP) constructs within the current CIP standard are limited to defining security zones at Open Systems Interconnection (OSI) Layer 3 and do not support security zones defined at layers other than OSI Layer 3. With current, widely deployed technology, networks are no longer solely defined by the arrangement of physical hardware and cables *inside* or *outside* of a *perimeter*. Networks can exist as a mixture of physical and virtual segments or purely in a virtual state within one device. Virtual firewalls and other security tools are also available to help secure these environments. Typical hardware network switches can be configured with internal logical isolation to implement multiple virtual networks within them. Accordingly, the SDT is reviewing the CIP standards to validate that definitions, requirements, and guidance regarding ESPs and Electronic Access Points (EAPs) continue to provide for secure and reliable operations. • Virtual Storage – Historically, servers were limited to dedicated storage within the device. Typically, the operating system and the applications resided in the server on hard drives. Virtual storage technologies such as Storage Area Networks (SANs) present virtualized	9/26/2019 CIP-005 Comment Period 6/28/2019 White Paper Informal Comment Period 12/18/2018 Informal Comment Period 11/2/2017 Informal Comment Period 4/11/2017 Informal Comment Period

	logical drive storage units to all attached servers. These types of environments then become a shared resource among many physical and virtual hosts.	
2016-02 Modifications to CIP Standards | CIP-002-6	Among other issues, the V5TAG recommended clarification of the phrase “used to perform the functional obligations of the Transmission Operator” in CIP-002-5.1a, Attachment 1, Criterion 2.12. Accordingly, the Project 2016-02 SDT proposes the following modifications to CIP-002-5.1a, Attachment 1, Criterion 2.12 to clarify the applicability of requirements to a TO Control Center that performs the functional obligations of a TOP. The proposed criterion establishes an average MVA line loading, based on voltage class, for BES Transmission Lines operated between 100 and 499 kV. The aggregate weighted value for applicable BES Cyber Systems must exceed 6000 to meet the minimum threshold established in Criterion 2.12 and can be calculated by summing the "weight value per line" shown in the associated table for each BES Transmission Line monitored and controlled by the Control Center or backup Control Center. If the aggregate weight value of lines exceed 6000, the Control Center’s associated BES Cyber System(s) must be identified as medium impact. If the aggregate weight value of lines does not exceed 6000, the Control Center’s associated BES Cyber System(s) must be evaluated for classification as low impact pursuant to Criterion 3.1.	6/12/2020 NERC Petition for approval 4/6/2020 Final Ballot 96.28% 12/16/2019 Additional Ballot 95.98% 7/17/2019 Additional Ballot 87.39% 10/9/2018 CIP-002-6: 55.89% 4/30/2018 Additional Ballot CIP-002-6: 93.31% 10/30/2017 Initial Ballot CIP-002-6: 66.78%

2017-07 Standards Alignment with Registration	On March 19, 2015, the Federal Energy Regulatory Commission (FERC) approved the North American Electric Reliability Corporation (NERC) Risk-Based Registration (RBR) Initiative in Docket No. RR15-4-000. FERC approved the removal of two functional categories, Purchasing-Selling Entity (PSE) and Interchange Authority (IA), from the NERC Compliance Registry due to the commercial nature of these categories posing little or no risk to the reliability of the bulk power system. FERC also approved the creation of a new registration category, Underfrequency Load Shedding (UFLS)-only Distribution Provider (DP), for PRC-005 and its progeny standards. FERC subsequently approved on compliance filing the removal of Load-Serving Entities (LSEs) from the NERC registry criteria. Several projects have addressed standards impacted by the RBR initiative since FERC approval; however, there remain some Reliability Standards that require minor revisions so that they align with the post-RBR registration impacts. Project 2017-07 Standards Alignment with Registration is focused on making the tailored Reliability Standards updates necessary to reflect the retirement of PSEs, IAs, and LSEs (as well as all of their applicable references). This alignment includes three categories: 1. Modifications to existing standards where the removal of the retired function may need replacement by another function. Specifically, Reliability Standard MOD-032-1 specifies certain data from LSEs that may need to be provided by other functional entities going forward. 2. Modifications where the applicable entity and references may be removed. These updates may be able to follow a similar process to the Paragraph 81 initiatives where standards are redlined and posted for industry comment and ballot. A majority of the edits would simply remove deregistered functional entities and their applicable requirements/references. Additionally PRC-005 will be updated to replace Distribution Providers (DP) with the more-limited UFLS-only DP to align with the post-RBR registration impacts. 3. Initiatives that can address RBR updates through the periodic review process. This would include the INT-004 and NUC-001 standards. In other words, rather than making the revisions immediately, this information would be provided to the periodic review teams currently reviewing INT-004 and NUC-001 so that any changes resulting from those periodic reviews, if any, may be proposed at the same time after completion of each periodic review. Removed MOD-032 from the scope of this project.	2/21/2020 NERC Petition for Approval 2/6/2020 NERC Board Approval 1/23/2020 Final Ballots 12/12/2019 Initial Ballots FAC-002-3: 99.69% IRO-010-3: 99.36% MOD-031-3: 99.69% MOD-033-2: 99.69% NUC-001-4: 99.29% PRC-006-4: 99.38% TOP-003-4: 99.69% Implementation Plan: 99.68% 3/2/2018 SAR Posting 1/9/2018 2nd SAR Posting 8/30/2017 SAR

2018-03 Standards Efficiency Review Retirements Standards Efficiency Review Page	The scope of this project is to evaluate NERC Reliability Standards using a risk-based approach to identify potential efficiencies through retirement or modification of Reliability Standard Requirements. Considering that many Reliability Standards have been mandatory and enforceable for 10+ years in North America, this project seeks to identify potential candidate requirements that are not essential for reliability, could be simplified or consolidated, and could thereby reduce regulatory obligations and/or compliance burden.	1/23/2020 FERC Issued Notice of Proposed Rulemaking 6/7/2019 NERC filed a Petition for Approval of IRO-002-7, TOP-001-5, and VAR-001-6 6/7/2019 NERC filed a Petition for Approval of SER Retirements (INT, FAC, PRC, and MOD) 6/7/2019 NERC filed a Notice of Withdrawal for proposed Reliability Standard MOD-001-2. 5/2/2019 Final Ballot 4/12/2019 Initial Ballot 9/26/2018 SAR Comment Period 7/10/2017 SAR Informal Comment Period 2/2/2018 Comment Period

2019-02 BCSI Access Management	This project enhances BES reliability by creating increased choice, greater flexibility, higher availability, and reduced-cost options for entities to manage their BES Cyber System Information, by providing a secure path towards utilization of modern third-party data storage and analysis systems. In addition, the proposed project would clarify the protections expected when utilizing third-party solutions (aka cloud). Standards Affected: CIP-004-6 and CIP-011-2	9/21/2020 Additional Ballots 2/3/2020 Initial Ballots CIP-004-7: 15.37% CIP-011-3: 13.04% IP: 22.30% 4/26/2019 SAR Comment Period
2019-03 Cyber Security Supply Chain Risks	**Background** This project will address the directives issued by FERC in Order No. 850 to modify the Supply Chain Standards. FERC directed NERC to submit modifications to address EACMSs, specifically those systems that provide electronic access control to high and medium impact BES Cyber Systems. FERC directed NERC to submit the modified Reliability Standard including the directed revisions for approval within 24 months from the effective date of Order No. 850. In addition, NERC also recommends revising the Supply Chain Standards to address Physical Access Control Systems (PACS) that provide physical access control (excluding alarming and logging) to high and medium impact BES Cyber Systems. The modifications to address PACS do not have a regulatory deadline, but will be addressed by this project. **Standard(s) Affected** – CIP-005-6 - Cyber Security - Electronic Security Perimeter(s) | CIP-010-3 - Cyber Security - Configuration Change Management and Vulnerability Assessments | CIP-013-1 - Cyber Security - Supply Chain Risk Management **Purpose/Industry Need** This project will address the directives issued by FERC in Order No. 850. This project will also address NERC staff recommendation from the Supply Chain Report.	9/10/2020 Additional Ballots 80.78% 6/22/2020 Additional Ballot 3/11/2020 Initial Ballot 50.51% 8/1/2019 SAR Comment Period
2019-04 Modifications to PRC-005-6	The SAR proposes revisions to PRC-005-6 that provide clear, unambiguous guidance on the scope of applicability to AVR protective functions. Without clear applicability, the industry is struggling with how to implement PRC-005-6 and what testing is acceptable to meet the required maintenance activities prescribed by PRC-005-6. This topic is only applicable to a Generator Owner that owns a synchronous generating unit with an installed digital AVR. The SAR also proposes revising PRC-005-6 to add a new section under Facilities to clearly delineate the applicability of Protection Systems associated with AVR protective functions, limiting the scope of the AVR protective functions to those elements that open a breaker directly or via lockout or tripping auxiliary relays.	7/8/2020 SAR Comment Period 8/28/2019 SAR Comment Period

2019-05 Modifications to PER-003-2	On February 11, 2019 the Personnel Certification Governance Committee (PCGC) posted a whitepaper for comment on proposed changes to the NERC System Operator Certification program. Referencing the PCGC's “One System Operator Certification Credential" whitepaper, all System Operators would hold the same Certification credential. This better serves reliability by ensuring all System Operators, regardless of their company's registration or credential of choice, have the same base knowledge. All System Operators will be tested to the same level of minimum knowledge and skills. This will help to eliminate knowledge silos within the System Operator community. This knowledge is demonstrated through the System Operator Certification process. The proposal is to change the current System Operator Certification from its current four credentials to one credential, “NERC Certified System Operator." During the comment period over 40 responses were received with an overwhelming majority in support of the proposed change. This project will revise PER-003-2 to address one credential is required, not the current four credentials. This better serves reliability by ensuring all System Operators, regardless of their company's registration or credential of choice, have the same base knowledge.	8/30/2019 SAR Comment Period
2019-06 Cold Weather	In July 2019, the FERC and NERC staff report titled *The South Central United States Cold Weather Bulk Electronic System Event of January 17, 2018* (Report) was released. Following the report, Southwest Power Pool, Inc. (SPP) submitted a SAR proposing a new standard development project to review and address the recommendations in the Report. The industry need for this SAR according to SPP is to enhance the reliability of the BES during cold weather event.	5/21/2020 Revised SAR Comment Period 3/19/2020 Revised SAR Comment Period 11/5/2018 SAR Comment Period
2020-01 Modifications to MOD-032-1	With the penetration of distributed energy resources (DER) continually increasing across the continent, it is imperative that the risk DER pose to the reliability of the Bulk Power System be minimized by improving the modeling of aggregate DER in planning studies. The SPIDERWG reviewed MOD-032-1 Data for Power System Modeling and Analysis and developed a Standard Authorization Request (SAR) requesting modifications be made to the standard to address the collecting and reporting of aggregate data for DER. This data is necessary to support the development of accurate interconnection-wide base cases for the planning horizon.	4/24/2020 SAR Comment Period

2020-02 Transmission-connected Resources	The potential risk of increasing amounts of reactive power being supplied by nonsynchronous sources was identified in *NERC's 2017 Long-term Reliability Assessment*. In response to the concern, the Planning Committee (PC) assigned the System Analysis and Modeling Subcommittee (SAMS) to study the issue. The SAMS developed the *Applicability of Transmission-Connected Reactive Devices* white paper, which was approved by the PC at its December 2019 meeting. The PC Executive Committee reviewed the draft SAR from SAMS at its January meeting and subsequently approved the SAR by email vote ending on February 11, 2020. The SAR was later accepted by the Standards Committee at its March 2020 meeting. **Standards Affected**: MOD-025, MOD-026, MOD-027, PRC-019, and PRC-024	5/13/2020 SAR Comment Period
2020-03 Supply Chain Low Impact Revisions	**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. **Standard Affected** – CIP-003-8	6/3/2020 SAR Comment Period
2020-04 Modifications to CIP-012	**Background** In Order No. 866, FERC stated that “maintaining the availability of communication networks and data should include provisions for incident recovery and continuity of operations in a responsible entity's compliance plan." FERC recognized that the redundancy of communication links cannot always be guaranteed, and acknowledged there should be plans for both recovery of compromised communication links and use of backup communication capability. The proposed scope of this project would entail modifications to CIP-012 – Communications between Control Centers. **Standard(s) Affected** – CIP-012 - Cyber Security – Communications between Control Centers	6/11/2020 SAR Comment Period

CIP Standards Efficiency Review	Using a risk-based approach, evaluate NERC CIP Reliability Standards in order to identify potential efficiencies through retirement or modification of Reliability Standard Requirements.	8/26/2019 CIP SER Matrix Comment Period
SER Phase II	**SER Phase 2 Scope and Approach** Evaluate NERC Reliability Standards (O&P and CIP), as informed by implementation experiences and compliance practices, to develop and recommend standards-based solutions intended to reduce inefficiencies and unnecessary regulatory burdens for the purpose of supporting continued safe, secure and reliable operations. The Phase 2 Team will focus on the following activities: • Identify areas of inefficiency in the current framework of Reliability Standards. • Collaborate and communicate with industry to ensure all areas of inefficiency and potential solutions are considered. • Potential solutions may include, but are not limited to: ○ SARs to remove inefficiencies in the Reliability Standards. ○ Policy recommendations to appropriate ERO staff or committee. • A sub-team, consisting of a few members from SER Phase 1 and Phase 2, are reviewing information from the SER Matrix input from the early stages of Phase 1, in order to identify efficiency opportunities not covered by Project 2018-03 SER Retirements or SER Phase 2. This sub-team is tasked with developing a SAR to summarize a consolidated list modification recommendations.	5/27/2020 Operational Data Exchange Simplification SAR Survey 9/23/2019 Evidence Retention Report Spreadsheet Comment Period

Technical Rationale for Reliability Standards	The current Reliability Standards template includes a Guidelines and Technical Basis (GTB) section to provide standard drafting teams a mechanism to: (i) explain the technical basis for the associated Reliability Standard (and Requirements therein); and (ii) provide technical guidance for the associated Reliability Standard (and Requirements therein). The ERO Enterprise recognizes that these sections help industry to understand the technology and technical elements in the Reliability Standard. The ERO continues to assess compliance based on the language of the Reliability Standard and the facts and circumstances presented. With the enactment of the Compliance Guidance Policy, it appears helpful to further clarify the distinction between Implementation Guidance and GTB (or Technical Rationale, as explained below). GTB should focus on technical rationale that assists technical understanding of a requirement and/or Reliability Standard. GTB should not include compliance examples or compliance language, as such information, if needed, should be developed as Implementation Guidance under the Compliance Guidance Policy.	4/20/2020 Non-binding Polls BAL-005-1 86.%47 EOP-008-2 87.77% NUC-001-3 87.12% TOP-002-4 85.48% TOP-003-3 85.71% TOP-010-1(i) 87.1% PRC-005-6 86.93% PRC-006-3 85.8% PRC-006-SERC-02 76.19% VAR-501-WECC-3.1 79.25% 12/18/2019 Non-binding Polls IRO-001-4: 84.91% IRO-002-6: 88.89% IRO-008-2: 86.57% IRO-009-2: 86.57% IRO-010-2: 86.79% IRO-014-3: 89.55% IRO-017-1: 88.75% IRO-018-1(i): 77.78%

		5/25/2018 Nomination Period

IV. FERC Actions

On September 17, 2020, FERC issued a Notice of Inquiry regarding Supply Chain risks. FERC seeks comment on the following:

- The extent of the use of equipment and services provided by certain entities identified as risks to national security related to bulk electric system operations;
- The risks to bulk electric system reliability and security posed by the use of equipment and services provided by certain entities;
- Whether the CIP Reliability Standards adequately mitigate the identified risks;
- What mandatory actions the Commission could consider taking to mitigate the risk of equipment and services provided by certain entities related to bulk electric system operations;
- Strategies that entities have implemented or plan to implement, in addition to the mandatory CIP Reliability Standards, to mitigate risks associated with use of equipment and services provided by certain entities; and
- Other methods the Commission may employ to address this matter.

On September 17, 2020, FERC issued an Order on SER Retirements.

- FERC approves 18 Reliability Standard requirements for retirement.
- FERC remands FAC-008-4 to address the Commission's concerns with retirement Requirement R8.

V. NERC Actions

On September 17, 2020, NERC submitted an informational filing regarding the following CIP Standards development projects:

- Project 2016-02 Modifications to CIP Standards focusing on virtualization; and
- Project 2019-02 BES Cyber System Information Access Management, which proposes provide a path toward the use of third-party data storage and analysis systems and by clarifying the protections expected when using cloud computing services.

VI. ERCOT Region Representatives on Standards Drafting Teams

Projects are removed from this list when FERC issues a Final Rule.

Project	ERCOT Region Representation
2015-09 Establish and Communicate System Operating Limits | FAC-010-3 FAC-011-3 FAC-014-2	**Member(s)**: Stephen Solis – ERCOT **Observer(s)**: Michael Cruz-Montes - CenterPoint

FAC-015-1	
2016-02 Modifications to CIP Standards	**Member(s)**: Jake Brown - ERCOT **Observer(s)**: Don Hunt – CenterPoint, William Sanders – Texas RE
2019-02 BCSI Access Management	**Member(s):** **Observer(s):** Kenath Carver – Texas RE **PMOS Liaison**: Kirk Rosener – CPS Energy
2019-03 Cyber Security Supply Chain Risks	**Member(s):** Jeffrey Sweet - AEP **Observer(s):**
2019-04 Modifications to PRC-005-6	**Member(s):** **Observer(s):**
2019-05 Modifications to PER-003-2	**Member(s):** **Observer(s):** Michael Cruz-Montes - CenterPoint
2019-06 Cold Weather	**Member(s):** Venona Greaff - Oxy
2020-01 Modifications to MOD-032-1	**Member(s):** Megan Miller - ERCOT **Observer(s):**
2020-02 Transmission-connected Resources	**Member(s):** **Observer(s):**
2020-03 Supply Chain Low Impact Revisions	**Member(s):** **Observer(s):**
2020-04 Modifications to CIP-012	**Member(s):** **Observer(s):**
Standards Efficiency Review	**Long Term Planning:** Larisa Loyferman - CenterPoint **Operations Planning:** Shirley Mathew – Austin Energy **Real-time Operations**: Michael Cruz-Montes – CenterPoint, Laura Zotter – Austin Energy
CIP Standards Efficiency Review	**Member(s):** Nicholas Morton – AEP, Lan Nguyen – CenterPoint Energy **Observer(s):**
Technical Rationale for Reliability Standards	**Member(s):** **Observer(s)**: Michael Cruz-Montes - CenterPoint Energy

VII. NERC and Texas RE Postings

- Violations: Visit NERC's Enforcement page at http://www.nerc.com/pa/comp/CE/Pages/Enforcement-and-Mitigation.aspx for information on the latest Public Violations (CIP and Non-CIP), Spreadsheet NOP filing and FFT informational spreadsheet
- Projected Postings: http://www.nerc.com/pa/Stand/Pages/Default.aspx. Click on "Projected Posting Schedule"
- NERC Standards - One Stop Shop: http://www.nerc.com/pa/Stand/Pages/Default.aspx. Click on "One-Stop-Shop (Status, Purpose, Implementation Plans, FERC Orders, RSAWs)"
- NERC filings at FERC: http://www.nerc.com/FilingsOrders/us/Pages/default.aspx.

- Texas RE's NERC standards links and summaries of newly approved standards: http://www.texasre.org/Pages/standards.aspx.