Harmonizing Large Load Interconnection Requirements in the West

WECC RAC/RRC Meeting

July 8, 2026

WIRAB
Western Interconnection
Regional Advisory Body

Who is WIRAB?

WIRAB
Western Interconnection Regional Advisory Body

- **Statutory Authority:** Established in 2005, as an independent body with statutory authority under Section 215(j) of the Federal Power Act to Advise FERC, NERC, and WECC on reliability matters in the Western Interconnection.
- **Membership:** All state and provinces with load served in the Western Interconnection
- **Funding:** Assessments approved by FERC to load serving entities under Section 215 of the Federal Power Act.

Last Year's IBR-IAG Effort: Harmonizing IBR Interconnection Requirements Across the West

Overview:

WIRAB and Elevate Energy are advancing a 2024 WIRAB recommendation to harmonize Inverter-Based Resource (IBR) interconnection requirements across the Western Interconnection.

Deliverable:

A publicly available template for Facility Interconnection Requirements (FIRs) for Transmission Providers.

Goals:

Increase IBR requirements education

Promote best practices aligned with IEEE 2800-2022

Encourage consistency and transparency across the West

Regular updates to WIRAB

Approach:

Hold monthly virtual stakeholder meetings (May–Dec 2025)

Review industry experiences

Draft and refine a FIR template

Facilitate regional information exchange

Industry Advisory Group:

Transmission Providers

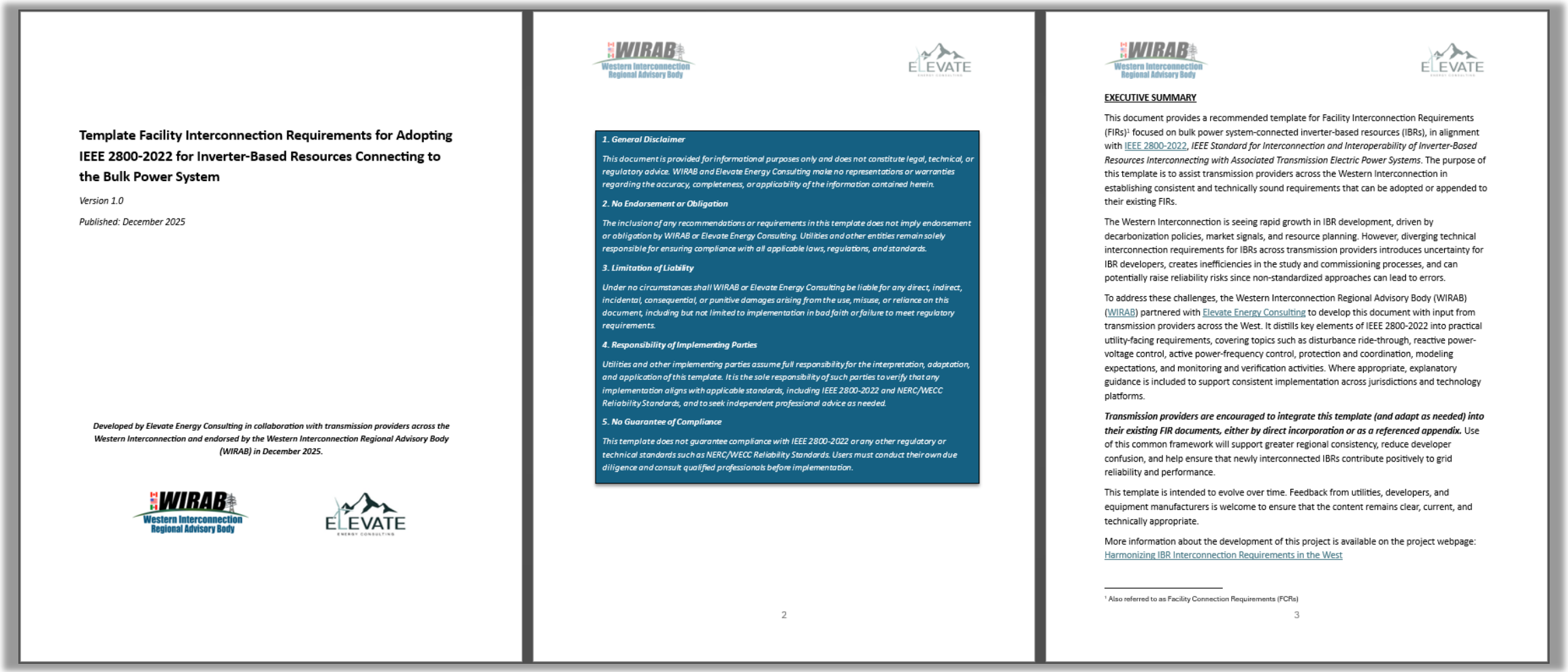
Transmission Planners

Transmission Regulatory Compliance Specialists

IBR Developers

Other technical experts

Template Facility Interconnection Requirements for IBRs



Template Facility Interconnection Requirements for Adopting IEEE 2800-2022 for Inverter-Based Resources Connecting to the Bulk Power System

Version 1.0

Published: December 2025

Developed by Elevate Energy Consulting in collaboration with transmission providers across the Western Interconnection and endorsed by the Western Interconnection Regional Advisory Body (WIRAB) in December 2025.

1. General Disclaimer

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2. No Endorsement or Obligation

The inclusion of any recommendations or requirements in this template does not imply endorsement or obligation by WIRAB or Elevate Energy Consulting. Utilities and other entities remain solely responsible for ensuring compliance with all applicable laws, regulations, and standards.

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4. Responsibility of Implementing Parties

Utilities and other implementing parties assume full responsibility for the interpretation, adaptation, and application of this template. It is the sole responsibility of such parties to verify that any implementation aligns with applicable standards, including IEEE 2800-2022 and NERC/WECC Reliability Standards, and to seek independent professional advice as needed.

5. No Guarantee of Compliance

This template does not guarantee compliance with IEEE 2800-2022 or any other regulatory or technical standards such as NERC/WECC Reliability Standards. Users must conduct their own due diligence and consult qualified professionals before implementation.

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EXECUTIVE SUMMARY

This document provides a recommended template for Facility Interconnection Requirements (FIRs)[1] focused on bulk power system-connected inverter-based resources (IBRs), in alignment with IEEE 2800-2022, *IEEE Standard for Interconnection and Interoperability of Inverter-Based Resources Interconnecting with Associated Transmission Electric Power Systems*. The purpose of this template is to assist transmission providers across the Western Interconnection in establishing consistent and technically sound requirements that can be adopted or appended to their existing FIRs.

The Western Interconnection is seeing rapid growth in IBR development, driven by decarbonization policies, market signals, and resource planning. However, diverging technical interconnection requirements for IBRs across transmission providers introduces uncertainty for IBR developers, creates inefficiencies in the study and commissioning processes, and can potentially raise reliability risks since non-standardized approaches can lead to errors.

To address these challenges, the Western Interconnection Regional Advisory Body (WIRAB) (WIRAB) partnered with Elevate Energy Consulting to develop this document with input from transmission providers across the West. It distills key elements of IEEE 2800-2022 into practical utility-facing requirements, covering topics such as disturbance ride-through, reactive power-voltage control, active power-frequency control, protection and coordination, modeling expectations, and monitoring and verification activities. Where appropriate, explanatory guidance is included to support consistent implementation across jurisdictions and technology platforms.

Transmission providers are encouraged to integrate this template (and adapt as needed) into their existing FIR documents, either by direct incorporation or as a referenced appendix. Use of this common framework will support greater regional consistency, reduce developer confusion, and help ensure that newly interconnected IBRs contribute positively to grid reliability and performance.

This template is intended to evolve over time. Feedback from utilities, developers, and equipment manufacturers is welcome to ensure that the content remains clear, current, and technically appropriate.

More information about the development of this project is available on the project webpage: Harmonizing IBR Interconnection Requirements in the West

[1] Also referred to as Facility Connection Requirements (FCRs)

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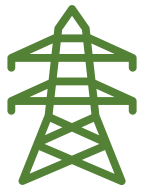
Available for Download:

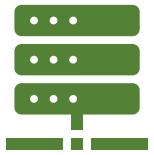
Harmonizing IBR Interconnection Requirements in the West - Western Interstate Energy Board

WIRAB's 2026 Strategic Initiatives



Long-term Planning Data and Models

Initiative 1: Advise WECC to work with states, provinces, and planning entities to improve long-term planning assumptions, data, and models to meet evolving regulatory and reliability needs.



Large-load Performance Requirements

Initiative 2: Advise WECC, NERC, and stakeholders to develop common interconnection and performance requirements for large loads—especially data centers—to ensure reliable and secure integration into the Bulk Power System.

Resource Adequacy with Electrification and Large Loads

Initiative 3: Advise WECC to study the impacts of rapid electrification and large load growth on reliability, including regional and seasonal resource adequacy trends.

Energy Storage Reliability Standards

Initiative 4: Advise WECC and the ERO to assess whether reliability standards adequately reflect the growing role of energy storage technologies in supporting grid stability and essential reliability services

Home | WIEB | WIRAB | CREPC | Nuclear | WEM-BOSR | COSR | MSC | Library | Webinars

Industry Advisory Group

WIRAB and Elevate will regularly convene Western stakeholders including utilities, states, system operators, and large load developers through an Industry Advisory Group (WIRAB-LL-IAG).

The Industry Advisory Group will serve as the primary forum for technical discussion and stakeholder engagement, helping inform the development of a Large Load Interconnection Requirements Template and related recommendations.

Building on WIRAB's successful **Inverter-Based Resources Industry Advisory Group** (WIRAB-IBR-IAG) effort launched in 2025, the WIRAB Large Load IAG will facilitate the sharing of practices, lessons learned, and recommendations related to large load interconnection and particularly focus on ways that harmonization can help support reliability and efficiency.

The meetings will be open to the public and you can join by registering here:

REGISTER FOR THE MEETING SERIES

Next Meeting:

July 16, 2026, 11:00 a.m. to 12:00 p.m. (MT)/10:00 a.m. to 11:00 a.m. (PT)

https://www.westernenergyboard.org/harmonizing-large-load-interconnection-requirements-in-the-west/

Large Load Industry Advisory Group Meeting Schedule

Western Interconnection Regional Advisory Body

Date	Topics
✅ May 28, 2026 (11:00 a.m.–12:00 p.m. MT)	Kickoff: Background, Goals, and Timeline
✅ June 25, 2026 (11:00 a.m.–12:00 p.m. MT)	Large Load Interconnection Requirements Review
July 16, 2026 (11:00 a.m.–12:00 p.m. MT)	Large Load Interconnection Requirements Template Section #1
August 13, 2026 (11:00 a.m.–12:00 p.m. MT)	Large Load Interconnection Requirements Template Section #2
September 24, 2026 (11:00 a.m.–12:00 p.m. MT)	Large Load Interconnection Requirements Template Section #3
October 22, 2026 (11:00 a.m.–12:00 p.m. MT)	Template Review and Finalizing
November 12, 2026 (11:00 a.m.–12:00 p.m. MT)	Template Finalizing and Next Steps
December 3, 2026 (11:00 a.m.–12:00 p.m. MT)	Industry and Public Webinar

Key Reliability Challenges with Data Centers

- Ramping, variability, and uncertainty
- Impacts on frequency response and voltage control
- Generator cycling and strain
- Transmission utilization constraints
- Ride-through performance and dynamic response
- Power quality issues
- Transient stability impacts
- Subsynchronous oscillations
- Protection system impacts

Source: APPA

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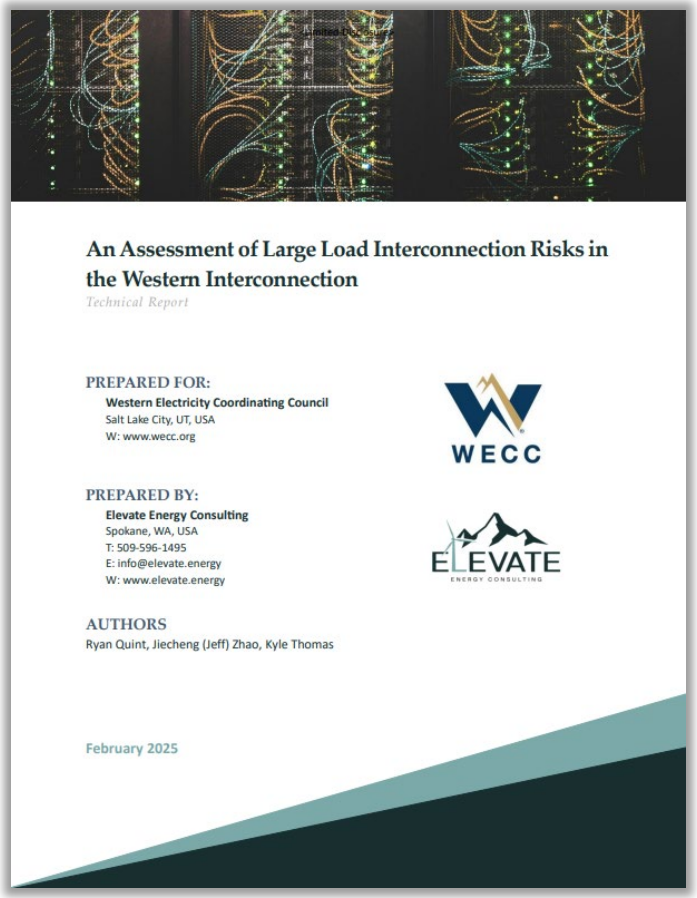
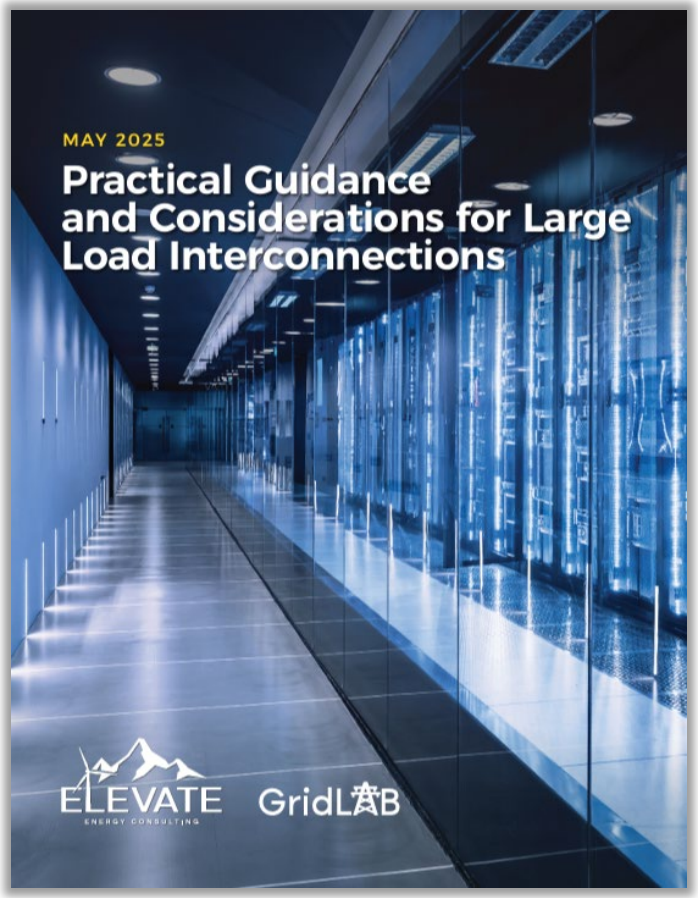
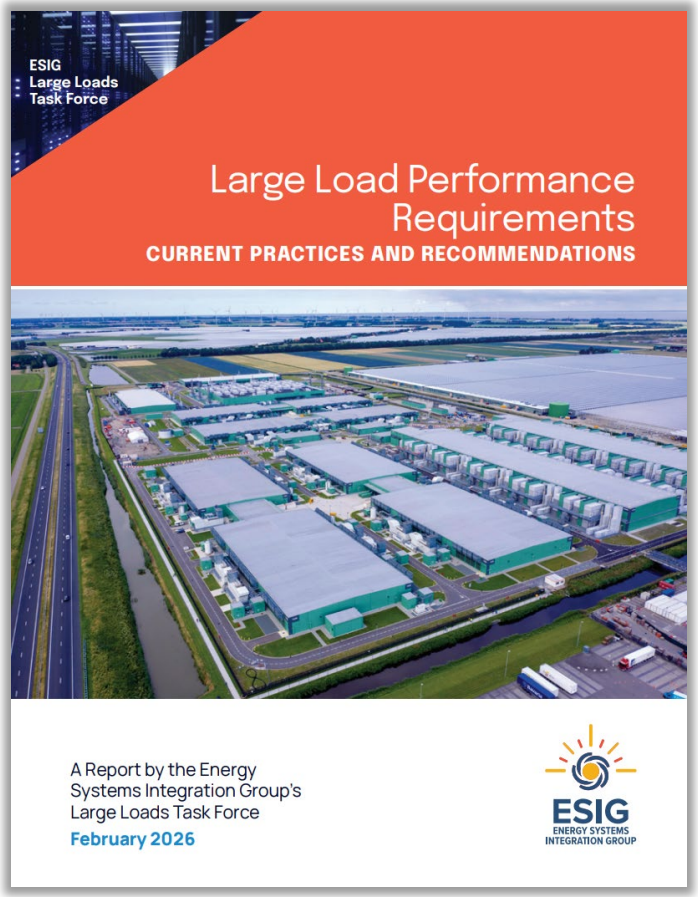
Large Load Interconnection References



Source: WECC



Source: GridLab



Source: ESIG

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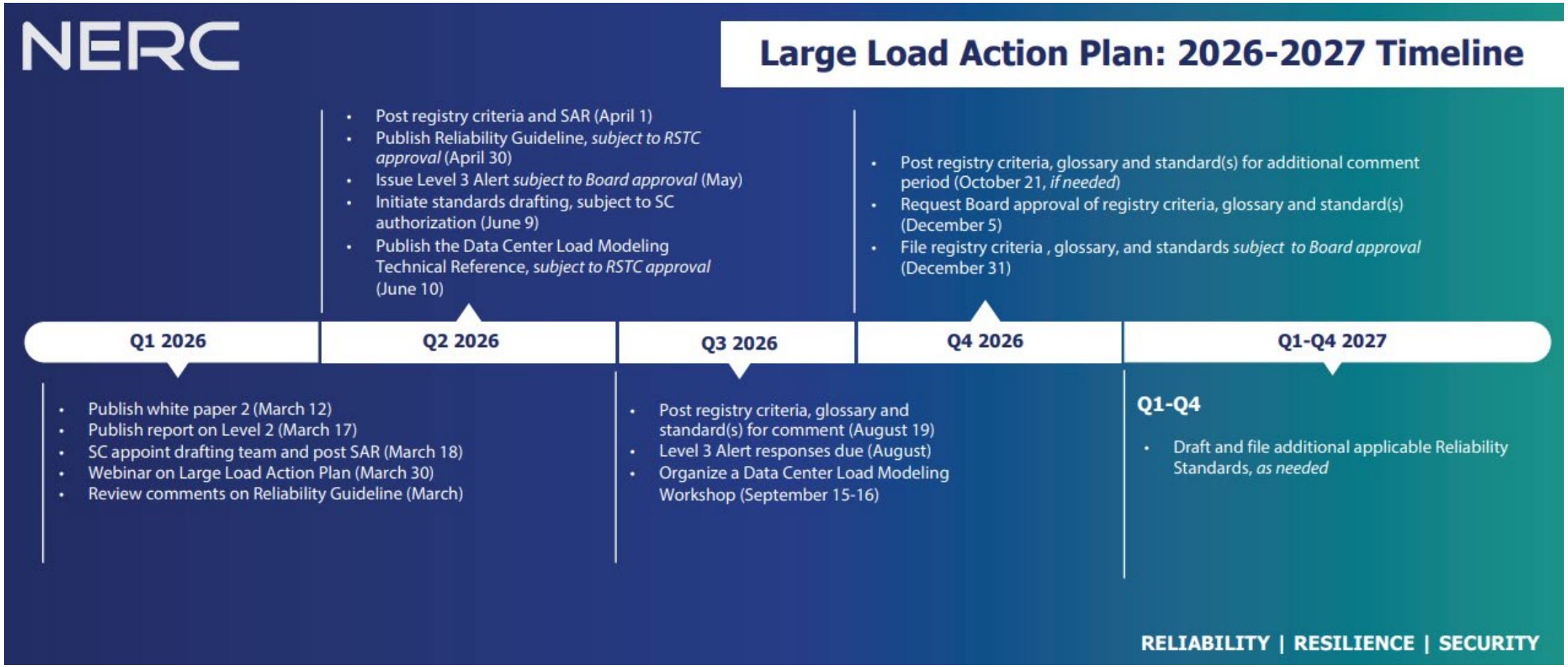
NERC ~~Large~~ Computational Load Action Plan: Q1 2026



Source: NERC

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NERC Level 3 Alert: Computational Loads

- Modeling Requirements
- System Studies
- Qualified Change Definition
- Commissioning Process and Checklist
- Non-Consequential Firm Load Loss
- Disturbance Monitoring
- Interpersonal Communications

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NERC Computational Load Registration + Standards

Computational Load: Load comprised of electric power demand from information technology equipment, such as servers, storage, and networking hardware.

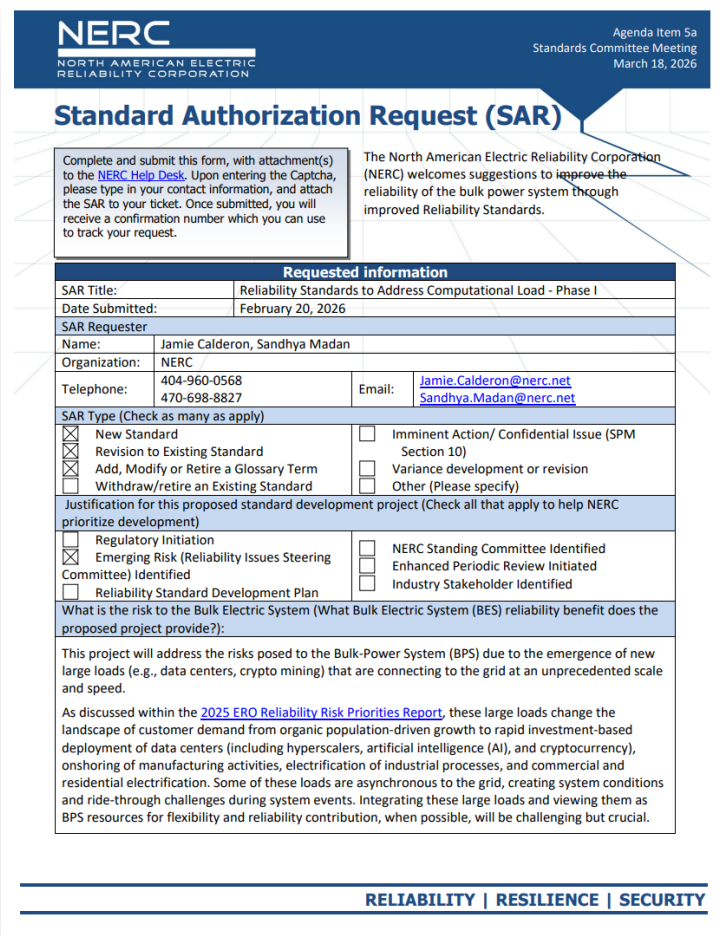
Computational Load Entity: the end-user or the entity that hosts end-users that receives electric power for Computational Load."

Must be registered with NERC if:

1) contributes to an aggregate connected Load capability **>= 20 MW**, and
2) at a single point of interconnection to the BPS at a voltage **>= 60 kV**, and
3) hosts **>= 1 MW of Computational Load.**

Result: if a 20 MW building has at least 1 MW of computational load, would be NERC Registered.

NERC's proposed definitions & registration criteria for Computational Loads



NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Agenda Item 5a
Standards Committee Meeting
March 18, 2026

Standard Authorization Request (SAR)

Complete and submit this form, with attachment(s) to the NERC Help Desk. Upon entering the Captcha, please type in your contact information, and attach the SAR to your ticket. Once submitted, you will receive a confirmation number which you can use to track your request.

The North American Electric Reliability Corporation (NERC) welcomes suggestions to improve the reliability of the bulk power system through improved Reliability Standards.

Requested information			
SAR Title:	Reliability Standards to Address Computational Load - Phase I		
Date Submitted:	February 20, 2026		
SAR Requester			
Name:	Jamie Calderon, Sandhya Madan		
Organization:	NERC		
Telephone:	404-960-0568 470-698-8827	Email:	Jamie.Calderon@nerc.net Sandhya.Madan@nerc.net

SAR Type (Check as many as apply)

- [x] New Standard
- [x] Revision to Existing Standard
- [x] Add, Modify or Retire a Glossary Term
- [ ] Withdraw/retire an Existing Standard
- [ ] Imminent Action/ Confidential Issue (SPM Section 10)
- [ ] Variance development or revision
- [ ] Other (Please specify)

Justification for this proposed standard development project (Check all that apply to help NERC prioritize development)

- [ ] Regulatory Initiation
- [x] Emerging Risk (Reliability Issues Steering Committee) Identified
- [ ] Reliability Standard Development Plan
- [ ] NERC Standing Committee Identified
- [ ] Enhanced Periodic Review Initiated
- [ ] Industry Stakeholder Identified

What is the risk to the Bulk Electric System (What Bulk Electric System (BES) reliability benefit does the proposed project provide?):

This project will address the risks posed to the Bulk-Power System (BPS) due to the emergence of new large loads (e.g., data centers, crypto mining) that are connecting to the grid at an unprecedented scale and speed.

As discussed within the 2025 ERO Reliability Risk Priorities Report, these large loads change the landscape of customer demand from organic population-driven growth to rapid investment-based deployment of data centers (including hyperscalers, artificial intelligence (AI), and cryptocurrency), onshoring of manufacturing activities, electrification of industrial processes, and commercial and residential electrification. Some of these loads are asynchronous to the grid, creating system conditions and ride-through challenges during system events. Integrating these large loads and viewing them as BPS resources for flexibility and reliability contribution, when possible, will be challenging but crucial.

RELIABILITY | RESILIENCE | SECURITY

SAR for NERC Standard(s) for Computational Loads

*snapshot in time, rapidly evolving

SDT Alignment with L3 Essential Actions

Project 2026-02 Page

Data Sharing	***Focus: Type of data, clear and transparent data specs, etc.*** • CLE provide data to TOs, TPs, PCs, TOPs, BAs, RCs for entities to perform required reliability functions.
Interconnection Process & Req's	***Focus: Interconnection process, coordination, and requirements*** • ***TOs have interconnection requirements for CLs*** • CLEs coordinate with TO on requirements and studies • TOs have procedures to coordinate with TPs, PCs, TOPs, RCs, and BAs on req's
Modeling and Studies	***Focus: Studies for CLs and Requesting Data from CLEs for Studies*** • TPs/PCs have procedures for performing interconnection studies for CLs • Define Qualified Change for CLs • Appropriate modeling in studies for CLs (steady-state, dynamics, short-circuit, EMT)
Protection and Monitoring	***Focus: Coordinate settings and have high-resolution monitoring*** • CLEs, TOs, DPs communicate and coordinate protection settings and coordination • TOs have procedures to confirm high-resolution monitoring and recording for CLs; procedures for obtaining such data for event analysis
Commissioning	***Focus: Process and coordination of commissioning activities*** • TOs have procedures for commissioning CLs • Coordinating with TPs, PCs, TOPs, RCs, and BAs on commissioning needs • Procedures to obtain model, data, and info updates due to changes during commissioning
Operations Comms & Response	***Focus: Flexibility in preferred interpersonal communications*** • CLs have interpersonal communications with TOPs and BAs • Coordination for loss of comms between entities • CLs respond to Operating Instruction from TOPs, BAs, and RCs, with exceptions

CL: *Computational Load*
CLE: *Computational Load Entity*

**Shared in public SDT meeting. Subject to change based on SDT discussions and activities. Consult SDT for specific details.*

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This Industry Advisory Group (IAG) Initiative

- Create forum to share lessons learned, questions, findings, etc.
- Foster harmonization of interconnection requirements for large loads across the West, with adequate room for system-specific needs
- Support smaller entities or entities that may be further behind
- Consolidate industry practices across various transmission providers
- ***Goals:***
  - Develop and publish “template” Facility Interconnection Requirements (FIRs) that entities can adopt and adapt, as needed
  - Provide an open, engaging, informal, collaborative, and respectful environment to share and learn together

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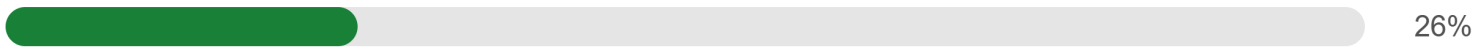
Would you prefer to see large load interconnection requirements inclusive of all large load types above a size threshold or should they be tailored to specific technologies (i.e., computational loads)?

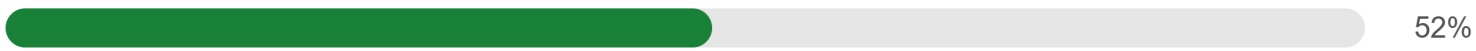
Multiple Choice Poll 27 votes 27 participants

Inclusive of all large load types connecting to the bulk power system - 7 votes



26%

Tailored to specific technologies (i.e., computational loads) - 14 votes

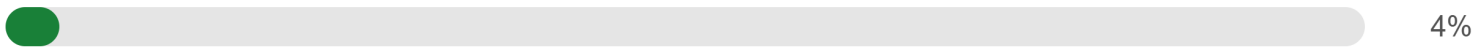


52%

Open to either approach - 5 votes

19%

Unsure at this time - 1 vote



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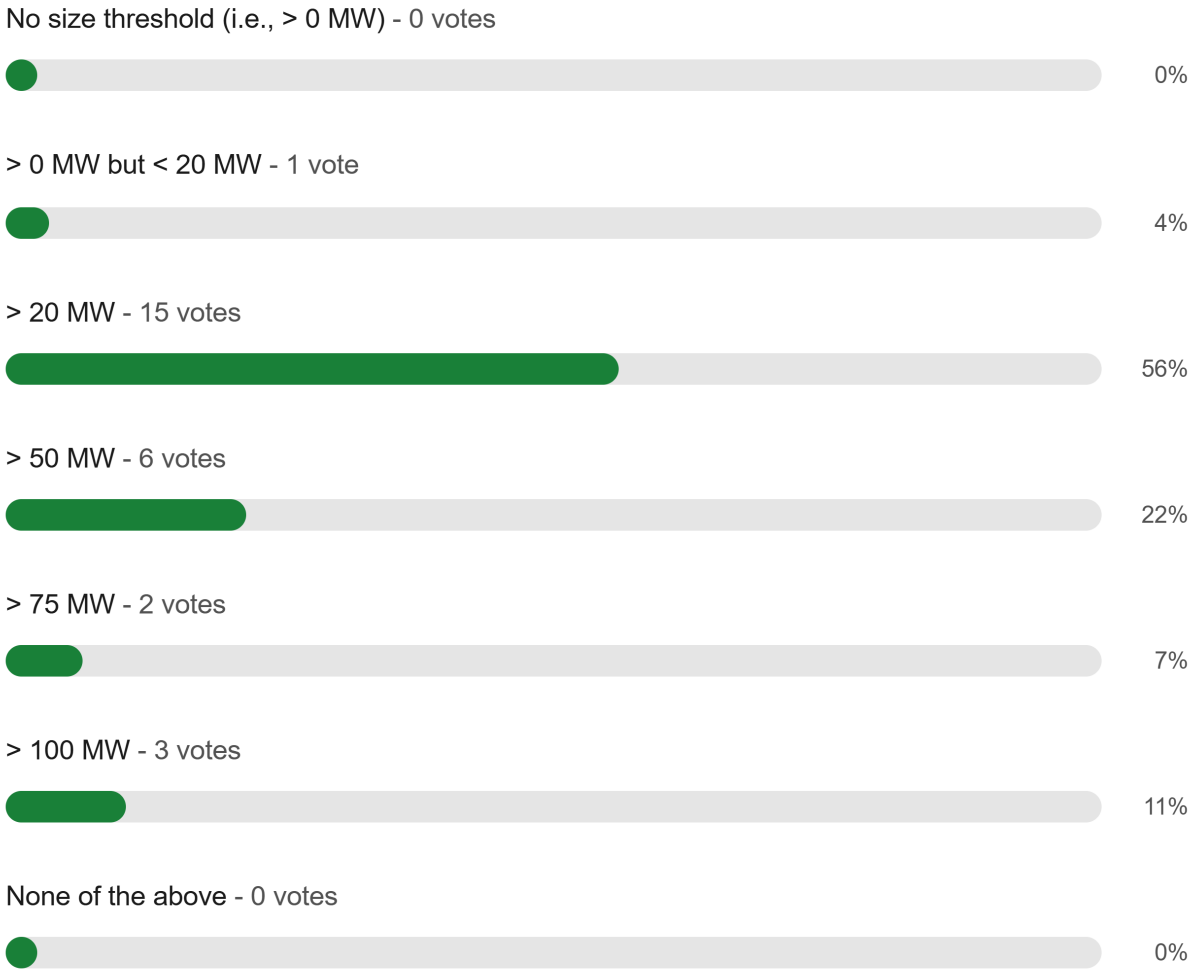
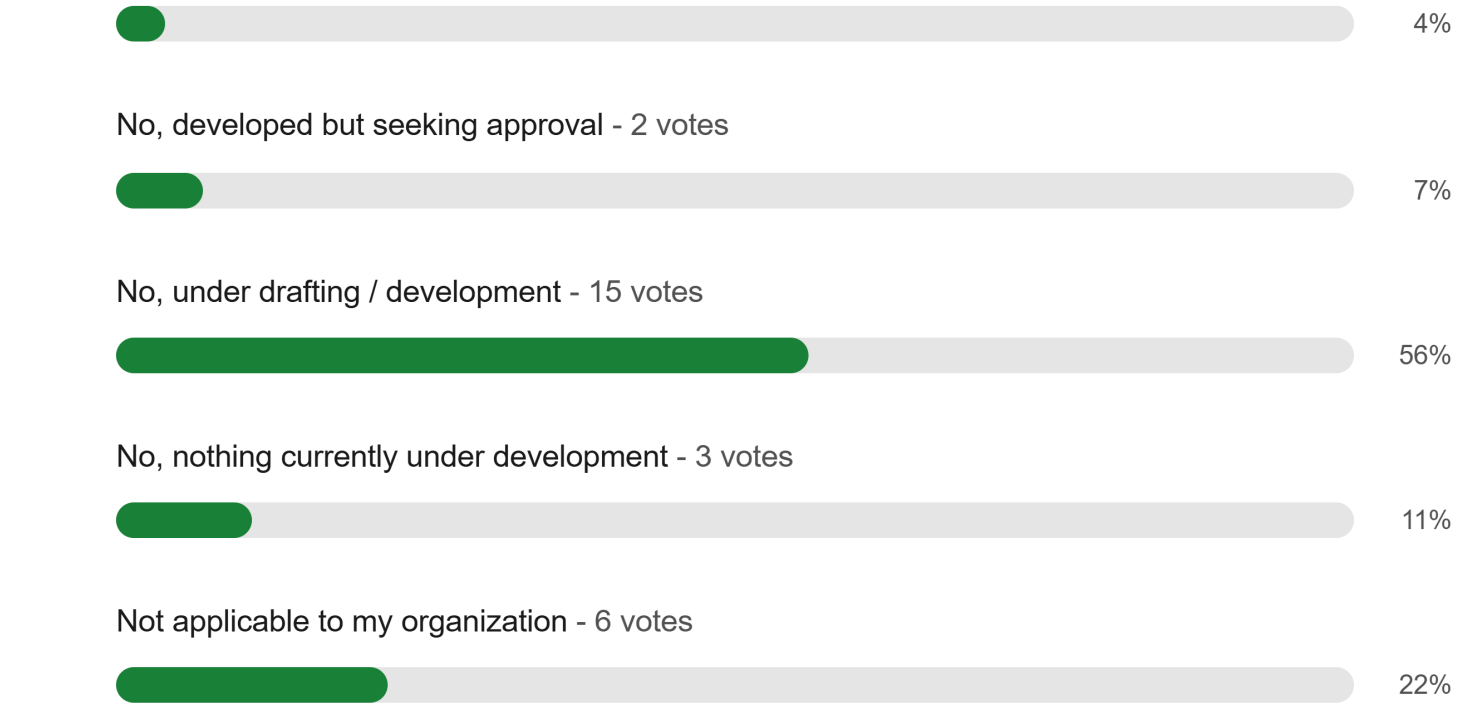
What size threshold (MW) do you believe suitable for establishing large load requirements for loads connecting to the bulk power system?

Multiple Choice Poll | 27 votes | 27 participants



Does your organization currently have interconnection requirements in place for large loads connecting to the transmission system (bulk power system)

Multiple Choice Poll | 27 votes | 27 participants



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Thank You!

Next Industry Advisory Group Meeting

July 16, 2026 at 11:00 AM MT

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Ryan Quint

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