Large Loads Frequently Asked Questions

August 2026

Addressing Large Loads on the Grid

An increasing number of large commercial and industrial loads are rapidly connecting to the bulk power system (BPS). In particular, "computational loads," such as data centers (including cryptocurrency and artificial intelligence), present unique BPS reliability challenges.

NERC established the Large Loads Task Force in August 2024 (now the Large Loads Working Group (LLWG)) to understand emerging large loads and identify effective pathways for their integration. The Member Representatives Committee provided written input and hosted a technical panel session at the February 2025 Board meeting. NERC's Board issued a resolution in February 2025 directing NERC staff to develop an action plan, which provides additional structure to NERC's efforts related to large loads integration. The LLWG's work products highlight some of the unique attributes associated with computational load integration. Through extensive analysis, report development, and engagement conducted to date, NERC has determined that it must act now to integrate computational loads to maintain a reliable and secure BPS.

NEW **Watch this video for a brief overview of NERC's upcoming actions addressing large computational loads with additional details available in the information provided below.**

What NERC is Doing Related to Large Computational Loads

NERC's Large Loads Action Plan is advancing a three-pronged, concurrent approach:

- **Registration Criteria for Computational Loads:** NERC will define which entities, based on specific physical and electrical criteria, will be required to register with NERC and comply with its Reliability Standards. NERC is proposing revisions to its Rules of Procedure to develop new registered entity types known as Computational Load Owners and Computational Load Operators.
- **Reliability Standards:** NERC will develop and adopt Reliability Standards to establish measurable requirements for registered entities with initial Reliability Standards required to be finalized by the end of 2026.
- **Technical Insights:** NERC is soliciting industry input through alerts that prompt specific actions for registered entities. Working groups give NERC and Regional Entity subject matter experts the opportunity to interact with stakeholders on the complexities surrounding the integration of large computational loads. White papers and other resources provide detailed analysis and recommendations for stakeholders.

In-Depth: NERC Actions to Address Large Computational Loads

Registration

NERC is proposing to establish new registered entity types called Computational Load Owner and Computational Load Operator (that would be subject to Reliability Standards) to address large computational loads. Accordingly, NERC plans to revise its Rules of Procedure, Appendix 5B Statement of Compliance Registry Criteria to account for Computational Load Entities. The draft was posted for an initial 45-day comment period on April 1, 2026, on the Proposed Changes to Rules of Procedure web page. In response to feedback, NERC posted proposed revisions that raised the MW and kV thresholds and developed a Computational Load Site definition, among other refinements to Appendices 2, 5A, and 5B for additional public comment for 30 days from August 19 to September 18, 2026. Stakeholders can submit comments here, and learn more here. NERC is required to finalize the registry criteria by the end of 2026.

Standards Development

In 2026, the drafting team under Project 2026-02 has prioritized foundational Reliability Standards with accompanying Glossary of Terms updates that align with changes to the registry criteria to support reliable computational load integration. Beginning in 2027, additional standards will examine broader, more integrated changes.

A 30-day initial formal comment period began on August 19, 2026, for stakeholders to provide input into proposed new computational load standards. Project 2026-02 will accept public comments through 8:00 p.m. Eastern on September 18, 2026. Project 2026-02 will accept public comments August 19 through September 18, 2026 with ballot period during the last 10 days. The proposed Reliability Standards would align with FERC's July order, and include improved situational awareness, enhanced model fidelity, clear expectations for interfacing entities, and a structured framework for ongoing standards development.

The proposed standards are based on requirements from currently enforced Reliability Standards that have been compliance-vetted and industry supported. Three foundational standards will address:

- CLO-001-1 Computational Load Interconnection, Studies, & Modeling Data.
- CLO-002-1 Computational Load Operational Data and Communications.
- CLO-003-1 Computational Load Protection Coordination and Disturbance Monitoring.

The proposal also includes very limited updates to FAC-001-5 and FAC-002-5 to ensure clarity. Stakeholders can submit comments via the Standards Balloting and Commenting System (SBS). To vote, Registered Ballot Body members must first join the Ballot Pool by 8:00 p.m. Eastern, September 3, 2026, via the link here. Stakeholders should review the Checklist for New Computational Loads for actions they can take to participate in the process. See below under "How Can I Get Involved?" for more information.

NERC has also established the Computational Load Short-Term Advisory Group to support the drafting team in the standards development process. There are 105 members on the Advisory Group. In addition, observers interested in this project may join public drafting team meetings. Additional information is on the Reliability Standards Under Development page.

Technical Insights

Large Loads Working Group

The Large Loads Working Group (LLWG) focuses on providing ongoing technical guidance, industry collaboration, and reliability risk assessment and monitoring for the increasing integration of large, complex, and rapidly evolving loads. The next meeting will take place on September 15. To join the LLWG, contact Evan Mickelson.

Load Modeling Working Group

The Load Modeling Working Group (LMWG) actively engages stakeholders through publications, technical presentations, and discussions focused on modeling loads for power system studies. The group recently published and will continue updating a technical reference document to inform industry on how to model emerging loads, including computational loads. The group has developed a tool to help data center and grid planners gather and submit data to improve the datacenter model quality. The LMWG is hosting a workshop on Data Center Modeling September 15-16 and will hold its next meeting on November 17.

To join the working group please contact Hasala Dharmawardena through this request form.

White Papers

In July 2025, NERC published a white paper on *Characteristics and Risks of Emerging Large Loads*, which found that peak demand (or power consumption) is just one of several factors that can impact BPS reliability, and further action is needed to address these risks.

A second white paper published in March 2026 examined *Gaps in Existing Practices, Requirements, and Reliability Standards for Emerging Loads* and found that the existing NERC Reliability Standards, as well as industry processes and requirements, are inadequate for the reliable integration of emerging large loads, including computational loads, onto the BPS. The white paper contains recommendations for NERC, the NERC LLWG, registered entities, regulators, and policymakers, as well as others. These recommendations include updates to registration criteria, Reliability Standards, processes, and requirements.

NERC is currently developing a white paper on Large Load Disturbance Performance: Impact Analysis and Ride-Through Recommendations that is targeted to be published in December 2026. The paper analyzes large load customer-initiated load reduction events and factors that impact large load performance during disturbances. This paper also provides recommendations for ride-through and post-fault active power recovery requirements, as well as other recommendations, to address BPS reliability risks. A Standard Authorization Request on this topic is also being developed by the LLWG.

Reliability Guideline

In May 2026, NERC published a Reliability Guideline: Risk Mitigation for Emerging Large Loads. The guideline is intended to supplement (rather than replace) any existing or new Reliability Standards, and it is voluntary and non-binding. The focus is on improving modeling practices, analyses, coordination, data collection efforts, real-time monitoring, and event analysis. NERC received more than 800 comments on the draft guideline and is appreciative of the level of stakeholder engagement.

Industry Alerts

In September 2025, NERC issued a Level 2 Industry Recommendation Alert urging industry participants to take specific actions to mitigate risks to BPS reliability that may arise from the integration of large loads. Specifically, the alert focuses on interconnection practices, dynamic modeling, simulation practices, and operational coordination related to large loads. NERC has posted a report summarizing the key findings from the Level 2 Alert.

In May 2026, NERC followed up with a Level 3 Essential Action Alert, urging seven near-term mitigation actions that current registered entities should take to address critical reliability risks from the integration of computational loads. The deadline for registered entities to submit their responses was August 3, 2026.

FERC Advance Notice of Proposed Rulemaking

NERC submitted comments to the Federal Energy Regulatory Commission's Advance Notice of Proposed Rulemaking (ANOPR) addressing the reliable interconnection of large loads. NERC previously filed comments in the Commission's co-location proceeding in Docket No. AD24-11. In the ANOPR comments, NERC cites its support for addressing the rapid growth of these large loads and appreciation for recognition of NERC's role and its request that future actions reference NERC's full authority under Section 215 of the Federal Power Act to include users, owners, and operators of the BPS. Additionally, the comments underscore that NERC is actively collaborating with stakeholders to assess risks and mitigation options and to provide details on potential future efforts.

In March 2026, NERC submitted a supplemental letter to FERC detailing an accelerated action plan, including revising registry criteria and Reliability Standards by the end of 2026. On July 16, 2026, FERC directed NERC to develop and submit

new or modified Reliability Standards and Registry Criteria by December 31, 2026 to address the reliability risks associated with the integration of computational loads into the BPS.

Technical Conference

NERC hosted a technical conference on February 24–25, 2026, to discuss power system risks and associated mitigation pathways for emerging large loads, focusing on computational loads. The conference focused on data centers and the characteristics of computational loads and demonstrated the need for risk mitigation specific for computational loads. This conference also discussed planning and operations, interconnection processes, facility performance requirements, and other topics related to the integration of computational loads.

How can I get involved in the process?

Collaboration and engagement are at the heart of all of NERC's initiatives. NERC has transitioned from the data collection and analysis phase to the comment and drafting phase in the development of Reliability Standards. As the process advances, perspective and input from stakeholders remains critical.

In 2026, stakeholders will have the opportunity to provide comments on the proposed registry criteria and Reliability Standards. NERC has a balloting process for passing Reliability Standards and definitions, ensuring that all interests are heard in a fair and equitable manner. Working groups and conferences will provide other opportunities to participate.

Stakeholders are encouraged to take the following steps:

- File comments on the second round of NERC Registry Criteria on or before September 18, 2026.
- Join the NERC listserv to receive important updates on the process. Contact Zach Greene, Manager Strategic Engagement, to join the listserv and ask other questions as needed.
- Review the Checklist for New Computational Loads with links to actions that stakeholders can take right now. These include:
  - Join the Registered Ballot Body to vote on Reliability Standards.
  - Create a Standards Balloting System Account to file comments.
  - Sign up for an ERO Portal account for more information.
- Join the Large Loads Working Group or the Load Modeling Working Group (please see above for the appropriate contact information).

How do I stay informed?

NERC has established a dedicated web page under the Initiatives tab on www.nerc.com to provide information on the Large Loads Action Plan. The page features resources from the LLWG and LMWG as well as Quarterly Updates, meeting presentations, recordings, and more information.

About Computational Loads and Their Unique Needs

What characteristics are typical for large loads?

Historically, large loads referred to industrial facilities with high electrical demand. They had longer interconnection[1] timelines that allowed for more study time under traditional planning processes. Currently, emerging large loads include cryptocurrency mining and data centers (conventional and artificial intelligence), which may be referred to as

[1] Interconnection refers to the process of integrating new generators, loads, or other equipment into the grid.

"computational loads." Many have a shorter timeline to interconnect (months vs. years) to the grid. In addition to these rapid timelines, some emerging large loads introduce new challenges to grid operators like rapid demand fluctuations and increased voltage sensitivity.

What unique factors exist with integrating computational loads onto the grid?

Integrating computational large loads onto the grid poses several unique factors, including accurately forecasting future demand, ensuring that transmission and generation capacity keep pace with this demand, and managing rapid fluctuations in consumption during all conditions—including fault and normal—which can destabilize the grid.

What reliability challenges do computational large loads pose to the bulk power system?

NERC has observed several reliability challenges resulting from computational loads around timing, data collection and forecasting, and modeling. The LLWG and other NERC assessments describe some of these matters as follows:

Timing

Some computational large loads seek to connect within one to two years, and the traditional planning processes are not equipped to ensure the grid can reliably serve this new demand. Additionally, the transmission upgrades required to handle the full new requested loads cannot be completed quickly enough. Since some loads want to connect to the BPS as soon as possible, they submit speculative interconnection requests to find the interconnection point with the fastest timeline, significantly increasing the number of interconnection studies utilities must perform. Due to the sheer number of interconnection requests, limited time is available to study the implications of these new loads.

Data Collection and Forecasting

To better quantify the risk, the electrical characteristics of computational large load facilities, such as ramping capabilities, power electronic settings, internal protection schemes, and coordination across multiple facilities, must be better understood. A better understanding of standardizing large-load modeling for long-term forecasting is needed.

Modeling

Current dynamic load models have challenges accurately representing the behavior of emerging large loads such as data centers. Considering the immense growth of these loads, modeling their dynamic behavior has become more critical than ever. NERC's LMWG is working on modeling methodologies that can accurately simulate these emerging loads' electrical behavior. These models can be used in studies to assess risks posed by large loads.

Transmission Planning

Currently, transmission expansion projects can take a decade from planning to energization. There is a growing urgency for processes to address the shorter-term needs associated with this rapid load growth. Additionally, rapid integration of computational large loads may pose short and long-term resource adequacy concerns, as generation can take years to be operational, longer than some large-load interconnection timelines of months to years. A proactive, holistic approach is necessary for integrating large loads.

Voltage Ride-Through

Currently, there are no specific voltage ride-through Reliability Standards for large loads. Computational large loads house a multitude of sensitive electronics that require ideal electrical conditions. If poor electrical conditions exist (like low voltage), computational loads can disconnect from the grid to protect their equipment from damage. This behavior gives rise to grid stability challenges.

Co-Locating Large Loads

Large loads co-located at generating facilities are referred to as co-located large loads. The Federal Energy Regulatory Commission, NERC, and industry began examining co-located loads in 2024, with additional proceedings in 2025 and 2026. Co-located loads present unique considerations as discussed in NERC's filing in that Commission proceeding.

NERC's findings and filings have highlighted the importance of planning and coordination to reduce risks, while noting that overall reliability impacts will depend on how large loads are implemented, their associated technologies, and any applicable regulatory framework. NERC has emphasized that maintaining diversity across electric generation and consumption will help ensure system reliability and resilience. NERC also noted the complexity of load balancing and forecasting associated with the changing resource mix. The complexity of this load and generation balance will continue to increase as more computational loads connect to the grid.

Continued assessments reflect other potential considerations. For example, co-location of a generation unit at a load facility (or vice versa) can result in close dynamic interactions between these loads, generation and parts of the connecting utility, even in scenarios where the utility connection is only the provider of last resort. These dynamic interactions could affect the reliability of the co-located facilities as well as the other users of the interconnected BPS.

Furthermore, generation capacity and the Essential Reliability Services that are associated with it are critical to maintaining BPS reliability. When generation capacity is removed or reduced from one location, the Essential Reliability Services it provided need to be supplemented elsewhere. Regardless of co-location or direct connection, sufficient Essential Reliability Services will need to be provided on the transforming grid to maintain BPS reliability. All utility-connected load facilities rely upon the Essential Reliability Services provided by the interconnected bulk power system.