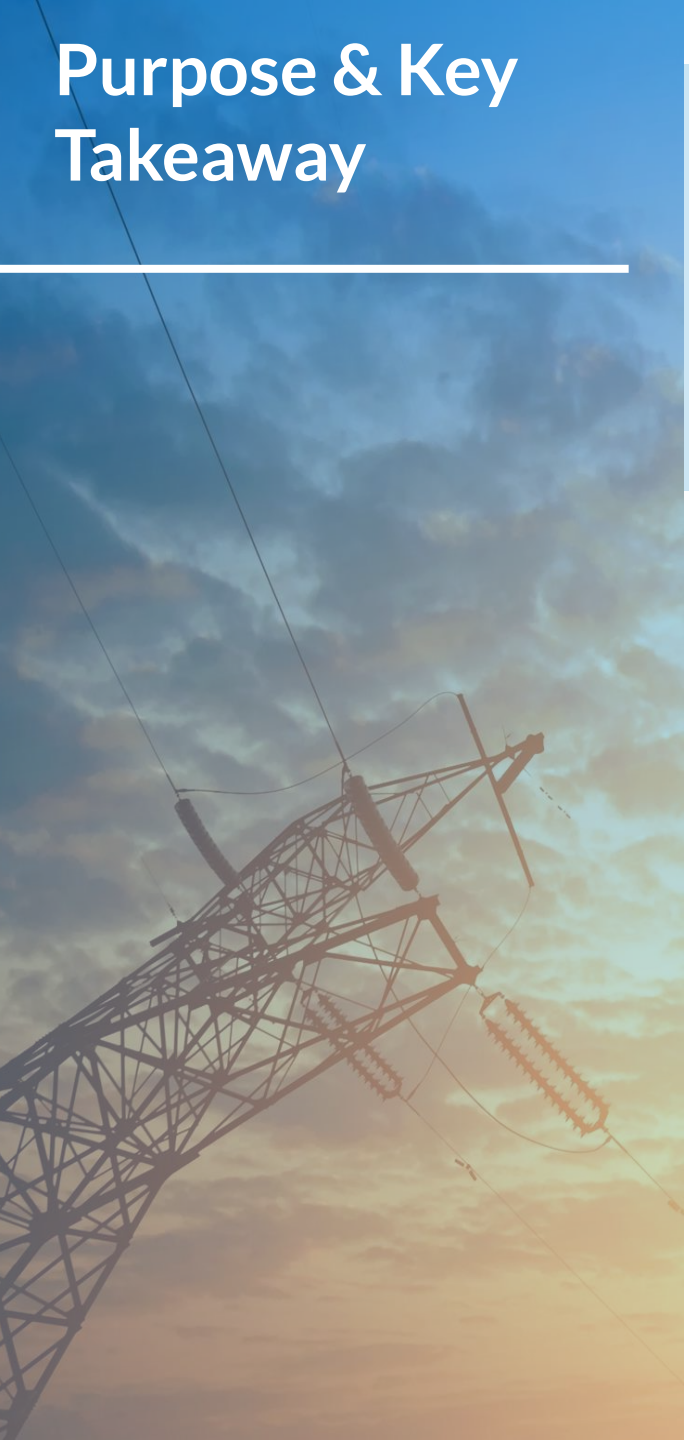


Large Load Interconnection Reliability Requirements (LLWG)

Large Load Working Group

June 10th, 2026

Purpose & Key Takeaway



Purpose

Review tariff redline for the Large Load Interconnection Reliability Requirements based on stakeholder feedback.

Key Takeaways

- MISO is targeting a June 30 Tariff filing to establish clear, enforceable Interconnection Reliability Requirements that protect system reliability.
- Revised Tariff language is posted with today's material.
- MISO's proposed framework is consistent with emerging NERC guidance and broader industry practices.
- Stakeholder feedback has significantly influenced the revised Tariff language, particularly around applicability, transition provisions, and requirement specific language.
- A well-defined transition plan is critical to manage active projects while preventing unnecessary retroactive obligations.

MISO is working closely with members and states to develop strategies to integrate large loads while balancing speed, reliability, and fairness



These three focus areas address the potential reliability risks created by large loads



Speed to reliable power

Large load can secure service quickly and without compromising reliability, accounting for the unique characteristics and commitments of the facility



Interconnection reliability requirements

A set of guidelines and requirements needed to support reliability are defined for large load at the time of interconnection



Reliable operations

The grid is operated reliably and efficiently with substantial levels of large load

Stakeholder Coordination



Large Load Interconnection Reliability Requirements Introduction

<u>Workshop</u>:

January 30, 2026*



Large Load definition development

<u>PAC Meeting:</u>

February 25, 2026*

April 22, 2026

May 27, 2026



Review drafts on requirements and discuss tariff language

<u>LLWG Meeting:</u>

April 20, 2026*

May 14, 2026*

June 10, 2026



File Tariff

June 30, 2026

* Formal Stakeholder Feedback Requested

MISO's approach to interconnection requirements is informed by recent developments in the industry, tailored to an ISO/RTO context



- Ramp Requirement
- Visibility Requirements
- Ride-through Requirements
- Stability Assessment Requirements

* Stability assessment requirements are being deferred to a future filing, likely later in 2026

MISO's interconnection framework relies on the Tariff to set requirements and the BPM to guide consistent implementation

Tariff Filing



- ✓ Provides high-level framework and requirements, focusing on who, what, when, and where
- ✓ Legally binding through FERC
- ✓ Target Filing: June 2026



Large Load BPM



- ✓ Provides specific guidelines for how the Tariff requirements are implemented
- ✓ Must be consistent with Tariff
- ✓ Target Development: May 2026 – August 2026

BPM: Business Practices Manual

Large Load BPM will be designed based on the foundation of existing MISO BPM and NERC standards

Large Load BPM	Existing Foundation	Existing Coverage	Large Load Expansion
Basic Facility Data	**MISO** : BPM -020 **NERC**: FAC-001 FAC-002	Existing TO interconnection and MTEP data-collection processes provide a foundation, but requirements are not standardized for Large Load	Standardize the Large Load intake package: configuration, Points of Withdrawal, one-line diagrams, staged MW buildout, firm and non-firm demand, dispatchable demand, power factor, load composition, co-located generation or storage, breaker configuration, and material-change notifications.
Modeling	**MISO**: BPM-020 **NERC**: MOD-032; MOD-033; TPL-001	Existing planning models capture load assumptions, but do not consistently represent dynamic behavior, power-electronics controls, or as-built Large Load performance.	Require load-specific steady-state and positive-sequence dynamic models, detailed load profiles, and final as-built models. For the Computational Load portion, require modeling of power-electronic behavior using PERC1 or equivalent model capability and an EMT model with supporting data necessary to evaluate system performance under EMT conditions. Non-Computational Load portions should use appropriate traditional PSPD load models.
Telemetry	**MISO**: BPM-031 BPM-010 **NERC**: TOP-003; IRO-010;	Existing ICCP and operational-modeling processes provide a foundation, but do not define a standardized Large Load telemetry package or PMU requirement.	Define the real-time telemetry data set, equipment-level metering thresholds, ICCP update frequency, data-quality expectations, correction timelines, disturbance-monitoring requirements, and PMU or equivalent synchronized-data specifications

TO: Transmission Owner | PERC1: Power Electronic Reconnecting and Ceasing | ICCP: Inter-control center protocol | PSPD: Positive sequence phasor domain | EMT: Electromagnetic transient | BPM: Business Practice Manual

Large Load BPM Design continued

Large Load BPM	Existing Foundation	Existing Coverage	Large Load Expansion
PMU	**NERC**: PRC-002	Existing disturbance-monitoring practices provide a foundation, but there is no standardized Large Load PMU requirement.	For the Computational Load portion, define required phasor measurements, reporting rate, time synchronization, communications, retention, acceptance testing, equivalent-device criteria, and TO-side installation requirements at the Point of Withdrawal. PMU requirements are not intended to apply to non-Computational Load portions unless otherwise required by the Transmission Provider.
Forecasting	**MISO**: BPM-025; BPM-011; BPM-020	Existing operational, resource-adequacy, and planning forecasts provide a foundation, but do not capture Large Load-specific behavior or staged Large Load buildout.	Add day-ahead and real-time forecasts, expected material ramp-event notifications, staged buildout forecasts, annual energy, and co-located generation plans.
Ramp	New		Applicable to the Computational Load portion of a Large Load, refer to "Ramp " section in the technical compendium
Ride-through	New, but has reference in GI process		Applicable to the Computational Load portion of a Large Load, refer to "Ride-through" section of the technical compendium for detailed technical requirements.

PMU: Phasor measurement unit | TO: Transmission operator

Common stakeholder feedback themes were addressed with Tariff revisions

Theme	Response
Provide more clarity in Large Load definition	MISO updated Tariff and BPM language to clarify treatment of existing loads, any expansions, and applicability date.
Lengthen 1-year transitional period, which is not feasible for mitigations with hardware upgrades	MISO updated the transitional provision to allow more flexibility.
Apply requirements based on characteristics of Load rather than all Large Loads	MISO updated the Applicability section to distinguish between Computational and Non-Computational Loads, and applied only ramp, PMU, ride-through, and advanced modeling requirements to Computational Loads.
Clearly define roles and responsibilities	MISO updated the Large Load Customer definition in Module A – New Defined Terms.
Provide more detail on MISO process for applicability and transitional	MISO expanded process detail across several Tariff sections, including applicability screening, pre-MTEP/EPR timing, and transitional provisions for in-flight projects.
Coordinate with NERC effort	MISO clarified that Tariff applicability for ramp/PMU/ride-through requirements aligns with NERC's emerging definition of Computational Loads and NERC's Load Modeling Task Force technical discussions.

Large Load definition was updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Tariff & Definition Clarifications	**Existing loads and expansions:** Apply a consistent material-modification trigger to existing facilities, including facilities above and below 50 MW.	√	
	Applicability date: Consider whether applicability should be tied to contract execution rather than energization or in-service date, actual power consumption	√	
Thresholds & Consistency	**Single-site applicability:** Clarify how geographic proximity, ownership, coordinated operations, and shared infrastructure determine whether facilities are treated as one Large Load.		√
	Multiple Points of Withdrawal: Clarify how a Large Load served through more than one Point of Withdrawal is evaluated.		√
Coordination with ZGIA & Other Interconnection Configuration	**Co-located generation and load:** Clarify how the requirements apply when a Large Load is associated with a ZGIA request or other co-located generation arrangement, including alignment between the load Point of Withdrawal and generation Point of Interconnection.	√ Ramp Req' section	√

Updated Tariff Language

Large Load Customer: A Tariff Customer that seeks, or expects to seek, Transmission Service on behalf of, or in order to provide Energy to, a Large Load. Large Load Customers include Load Serving Entities procuring or additional Network Integration Transmission Service to serve a Large Load .

Large Load Equipment: Any of the facilities, devices, or equipment that constitutes a part of a Large Load, or are used to interconnect the Large Load to the Transmission System.

Large Load: The Load associated with any facility or aggregation of facilities located at a single substation behind one or more Point(s) of Withdrawal from the Transmission System that is owned, operated, or controlled by: (a) a single entity or (b) a group of entities that will coordinate with respect to the profile of the Load, and that results in either:

(i) any Load with a forecast Demand of 50 MW or more or,

(ii) any modification or series of modifications that results in a cumulative increase of Demand by 25 MW or more, provided the total aggregate Load is 50 MW or more .

Point(s) of Withdrawal: The point(s) where a non-transmission facility used to withdraw Energy from the Transmission System to serve a Large Load connects to the Transmission System.

MISO applies interconnection reliability requirements based on the specific characteristics of Large Load

Non - Computational Load

Process and mechanical equipment driven load behavior

Load Type	Description	Profile	Ramping
Industrial Production & Extraction	Process-driven industrial operations	Cyclical / Process-driven	Low - Medium
Infrastructure & Public Service	Essential service	Mostly flat to peaky	Low - Medium
Agricultural & Processing	Product-processing demand	Seasonal / Process driven	Medium

Baseline Requirements

Basic Facility Data, Modeling, Telemetry, Forecast

Computational Load

Digitally driven, software-managed load behavior

Load Type	Description	Profile	Ramping
Data Center Cloud Storage	Computing infrastructure for data storage	Mostly flat / Continuous	Low-Medium
Data Center Artificial Intelligence; HPC[1]	Computing infrastructure for data processing	Dynamic / Workload-driven	High
Cryptocurrency Mining	Highly concentrated digital facility for validating blockchain	Moderate / Controllable	High

All Requirements

Baseline Requirements + Advanced Modeling + Ramp + PMU + Ride-through[2]

[1]HPC: High-performance Computing
[2]Applied to the computational component of the Large Load

Applicability of Reliability Requirements to Large Load

Theme	Element	Tariff Change	BPM
Applicability Trigger & Scope	**Threshold structure:** Baseline MW threshold; computational-load threshold; computational composition test	Hold	
	Applicability by load type: Non-computational loads; load type versus technical behavior	√	√
	Treatment of expansions: Requirements should only apply to the >25MW load expansion vs. the entire Large Load (existing + expansion)	Hold	
Applicability Process	**Process Timing:** Process entry point; data-submission timing		√
	Decision Authority: Applicability determination; roles and responsibilities; transparency	√	
	Flexibility Framework: Exemption process; Local Planning Criteria; firm-service safeguards	Hold	
Compliance & Enforcement	**Compliance Framework:** Binding obligations; verification; noncompliance definition	√	
	Escalation framework: Corrective actions; process delay; operational restrictions;		√

Updated Tariff Language

All Large Load shall be subject to the Basic Facility Data, Modeling, Telemetry, Forecast Data, and Audit requirements set forth in Sections 37A.2 through 37A.5 and section 37A.9 of the Tariff.

Any Computational Load associated with a Large Load shall be subject to the Phasor Measurement, Ride-Through and Ramp requirements set forth in Sections 37A.6 through 37A.8 of the Tariff. The Transmission Provider shall determine whether Computational Load is associated with a Large Load based on information provided by the Large Load Customer to the Transmission Provider for such purpose.

Prior to the Service Commencement Date of a Large Load, the Large Load Customer must provide all information required by the Transmission Provider to demonstrate that the Large Load Customer, or its Designated Agent, complies with all applicable basic facility information, modeling, metering, telemetry, data storage and transmission, and other reliability, operation, planning and accounting standards and requirements for the operation the Large Load in the Transmission Provider Region.

Transmission Service Requirements for Large Load

A Large Load Customer must procure appropriate Transmission Service to meet the full amount of the peak Demand of the Large Load and must meet the registration and reliability requirements as provided in this section and the Business Practices Manual for Large Load. Failure to meet such requirements at any time may result in disconnection of the Large Load from the Transmission System and disqualification of the Large Load from taking service under this Tariff.

A Large Load Customer requesting Transmission Service, or that expects to request service, under Module B of this Tariff must submit an Application to the Transmission Provider pursuant to Section 29.2 of the Tariff as far as possible in advance, and in any event no less than two years in advance of the month in which service is expected to commence for a Large Load.

A Large Load Customer shall include all available information related to a Load that is expected to meet the definition of a Large Load in its annual updates of Network Load and Network Resource forecasts as required in Section 31.6 of the Tariff including, but not limited to, any information provided under Section 29.2(ix) pursuant to the Transmission Provider's planning processes in Attachment FF.

A Large Load Customer shall be responsible for complying with each of the requirements of this Section 37A for each Large Load it represents. A Large Load Customer shall demonstrate its ability to effectuate compliance with each of the requirements of this Section 37A, including by providing Transmission Providing with any applicable agreement(s) between the Large Load Customer and the entity or entities that own, operate or use the Large Load demonstrating that the Large Load Customer with be provided access to all information reasonably required to enable the Large Load Customer to comply with and verify compliance with the requirements of this Section 37A, including compliance with the terms of any operating protocols adopted by the Transmission Provider and/or the Large Load Customer.

Stakeholder Feedback on Large Load Transitional Provision

Theme	Element	Tariff Change	BPM
Implementation Timing and Staging	**Transition period and compliance deadlines:** Extend the transition period to reflect hardware design, procurement, permitting, and implementation needs. Several stakeholders indicated that one year is insufficient and recommended at least three years	√	
	Phased implementation: Consider staging the requirements rather than applying the full framework at once. Ensure foundational concepts and screening processes are sufficiently defined before compliance is required.	√	√
Treatment of Existing, Committed, and Late-Stage Projects	**Grandfathering and project-stage treatment:** Clarify how the framework applies to operational, approved, committed, and late-stage projects, including projects with significant land, permitting, engineering, or procurement investments.	√	√
	MTEP Appendix A and phased-expansion treatment: Determine whether MTEP Appendix A projects should be exempt and clarify whether requirements apply only to future phases of an expanding Large Load.	Hold	
Screening, Exceptions, and Conditional Treatment	**Reliability screening and BES-risk criteria:** Define the screening process and the criteria used to determine whether a project presents a Bulk Electric System reliability risk. Reconcile the framework with ongoing NERC work.	√	√
	Waivers, extensions, and overrides: Establish a transparent process for requesting waivers, extensions, or requirement adjustments, including eligibility criteria, decision authority, and timing.	√	√
	Conditional service: Consider allowing staged or conditional service where a customer can operate within defined limits while completing required mitigation.	Hold	

[Previous] The transitional provision ensures existing or early-stage Large Loads are given a defined path and reasonable timeframe to meet new reliability requirements while mitigating system impacts in the interim



Legacy Period

In-service Prior to Effective Date

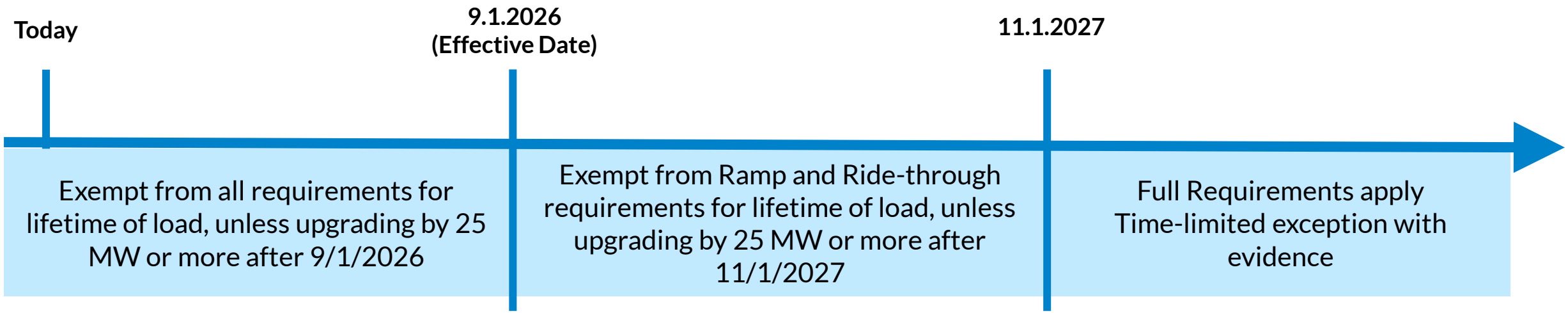
Transitional Period

In-service After the Effective Date

Large load campuses must comply with all requirements by in-service date, except for:

- Ramp and Ride-through requirements by 1 year after the Effective Date
- Mitigation plan required until all requirements are met

[Updated] The transitional provision ensures in-flight Large Loads are given a defined path and reasonable timeframe to meet reliability requirements while mitigating system impacts in the interim



Trigger: Large Load Service Commencement Date

TRANSITION PROVISION

All Large Load shall be subject to all requirements as set forth in this Section 37A, except that:

a) A Large Load with a Service Commencement Date prior to September 1, 2026, shall not be subject to the requirements set forth in this Section 37A.

b) A Large Load with a Service Commencement Date after September 1, 2026, but prior to November 1, 2027, shall be subject to all requirements set forth in Section 37A except for the ride-through requirements set forth in Section 37A.7 and the ramp requirements set forth in Section 37A.8.

c) A Large Load with a Service Commencement Date after November 1, 2027, shall be subject to all requirements set forth in Section 37A except to the extent that the Large Load Customer demonstrates to the satisfaction of Transmission Provider that additional time is necessary to meet any such requirement(s) after the Service Commencement Date. In such case, the Large Load Customer must establish operating protocols with the Transmission Provider and the applicable Transmission Owner and/or Local Balancing Authority necessary to mitigate any reliability impacts to the Transmission System or Bulk Electric System to be in effect until compliance with the applicable requirement(s) is achieved. Such operating protocols shall address the specific actions, operational limitations, or equipment to be used to address any reliability impacts to the Transmission System or Bulk Electric System, and shall provide a mechanism for the Transmission Provider and the applicable Transmission Owner and/or Local Balancing Authority to monitor and inspect the performance of the Large Load in order to verify compliance. Any operating protocols established pursuant to this Section shall remain in effect until the Large Load is capable of compliance with the applicable requirement(s).

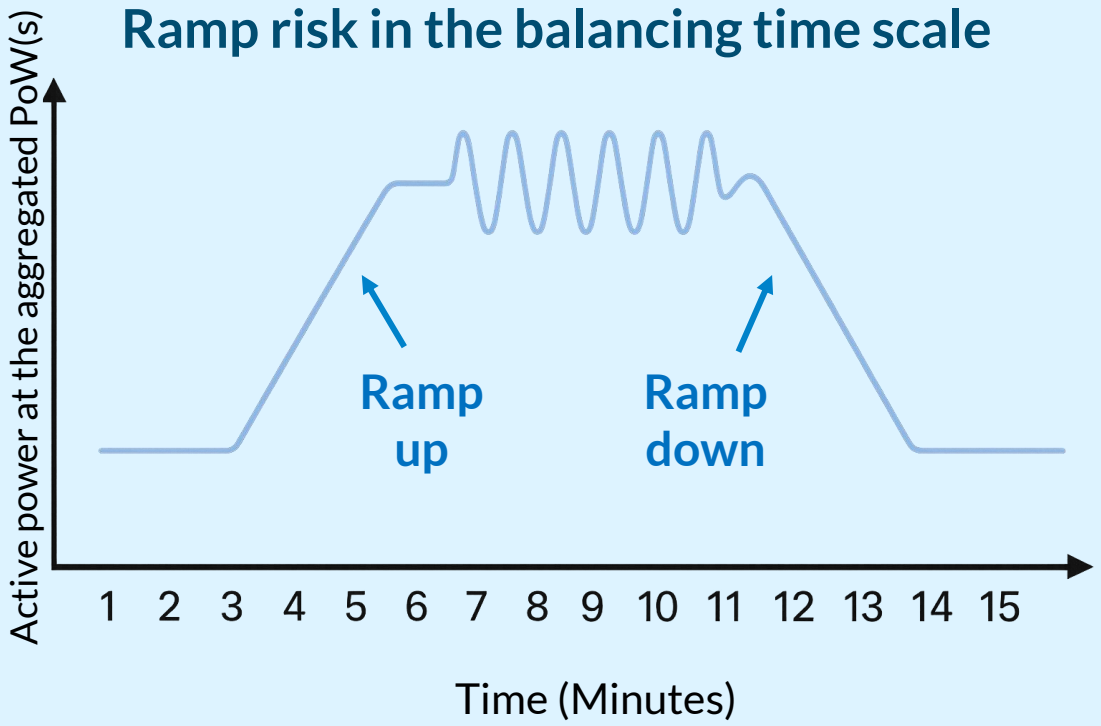
Ramp Requirements



Ramp requirement updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Purpose and Scope	**Focus on stable-state transitions:** Apply ramp requirements when a facility starts, stops, or materially changes a large process to reach a new operating level. The requirements should support reserves, scheduling, contingency analysis, and other operator needs.	√	√
	Exclude disturbance-driven behavior: Distinguish controllable transitions from repetitive oscillations, trips, environmental-control responses, and other behavior outside normal ramp management.	√	
	Avoid tripping as a compliance mechanism: Do not rely on customer tripping where it could create additional reliability risk.		√
Calculation and Implementation	**Ramp-limit design:** Explain the basis for the proposed 30 MW/min limit and consider whether limits should vary by location, system strength, and load characteristics.		√
	Calculation methodology: Define the measurement interval, use of five-minute averages, and whether sub-five-minute limits apply.		√

Large Load Ramp Rate Requirements



Large loads may introduce additional variability in the Automatic Generation Control (AGC) time scale. This effect can increase the risk of inadequate system balancing at the minute-to-minute level.

Updated Tariff Language

Large Load comprised of any Computational Load shall be subject to the ramp requirements set forth in this section. Ramp limits shall be measured in aggregate across the applicable Point(s) of Withdrawal of a Large Load during stable-state transition, including any reduction/ramp smoothing provided by any generation for which the Large Load constitutes ZG Associated Load. Large Load shall be subject to up-ramp and down-ramp limits established by the Transmission Provider consistent with the process set forth in the Business Practices Manual for Large Load. The Large Load must have an effective up and down ramp rate not exceeding the specified limit outlined in the Business Practices Manual for Large Load unless otherwise directed by the Balancing Authority, Reliability Coordinator, or Transmission Operator.

Visibility requirements



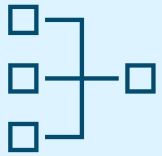
Basic facility information requirements updated based on stakeholder feedback

Theme	Elements	Tariff Change	BPM
Roles and Responsibilities	Clarify who submits data; allow Large Load Customer or designee to provide required information	√	
Integration of Long-Term Forecast Items	Merge long-term forecast elements (staged additions, annual energy) into Basic Facility Data; remove standalone long-term forecast section	√	

BPM: Business Practice Manual

Basic Facility Information Requirements

Basic Facility Data Requirements



- ❑ Basic facility data required to be provided to the Transmission Provider
- ❑ Load MW amounts, firm and non-firm MW amounts, any dispatchable Load MWs, power factor, metering, telemetry, breaker configuration
- ❑ Staged additions and annual energy

Updated Tariff Language

A Large Load Customer shall be responsible for providing the Transmission Provider with basic information, one-line diagrams, and a description of the electrical characteristics of the Large Load for all Large Load Equipment, in the format and consistent with the timelines specified in the Business Practice Manual for Large Load. Any changes to the characteristics of a Large Load and/or Large Load Equipment, including any changes to the modeling details for the Large Load, shall be provided to the Transmission Provider in a timely manner, consistent with the Business Practices Manual for Large Load. Such changes may include, but are not limited to, Load MW amounts, firm and non-firm MW amounts, any dispatchable Load MWs, power factor, metering, telemetry, breaker configuration, staged additions and annual energy as further set forth in the Business Practices Manual for Large Load.

A Large Load Customer must coordinate with the Transmission Owner where the Large Load Point of Withdrawal is located pursuant to the Transmission Provider's load interconnection guidance and applicable NERC standards.

Modeling requirements updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Roles and Responsibilities	Modeling obligation placed on LSE/TO (Large Load Customer), not end-user; clarification still needed	√	
Material Change and Update Triggers	Need clear triggers for update	√	
Technology-Specific Modeling	Use appropriate models (PERC1, CMLD, etc.)		√
Confidentiality and Data Protections	Avoid requiring TO/LSE to certify customer models and protect sensitive data		√

BPM: Business Practice Manual

Modeling Requirements



- ❑ Modeling data required to be provided to the Transmission Provider
- ❑ Modeling data including validated electrical models, detailed load profiles, and applicable modeling updates to evaluated system performance
- ❑ Dynamic model(s) necessary to evaluate Large Load performance

Updated Tariff Language

A Large Load Customer shall provide the Transmission Provider with verified and complete electrical models of the Large Load, as well as detailed Load Profiles, for modeled Loads, as set forth in the Business Practices Manual for Transmission Planning. Such model information must include sufficient detail for Transmission Provider to evaluate system performance under contingency conditions in accordance with currently active versions of Transmission System Planning Performance Standards.

Following completion of applicable studies and prior to its Service Commencement Date, the Large Load Customer shall submit final verified models to the Transmission Provider in accordance with the Business Practices Manual for Large Load. The Large Load Customer shall provide notice to Transmission Provider of any material modifications to the Large Load and shall not implement any such proposed modifications until studied and approved by Transmission Provider in accordance with the Business Practices Manual for Large Load.

The final models of a Large Load shall reflect the as-built configuration and actual operating characteristics of the Large Load and Large Load Equipment. The Large Load Customer shall maintain and update models as required by the Transmission Provider. Failure to provide requested information may result in a delayed Service Commencement Date, operational limitations, or disconnection from the Transmission System.

Telemetry requirements updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Event Monitoring Responsibility	Fault recording/monitoring must be assigned to Transmission Owner, not LSE, consistent with PRC-002 / PRC-028	√	
Equipment Categories and Data Requirements	Need clarity on what equipment must provide telemetry and what data types are required (load vs. generation)		√
Real-Time Streaming and Retention	Stakeholders prefer upon-request telemetry rather than continuous real-time streaming; define data retention windows		√

BPM: Business Practice Manual

Telemetry Requirements

Telemetry Data Requirements



- ❑ Accurate data feed to the State Estimator
- ❑ Synchronizing with Security Constrained Economic Dispatch (SCED)
- ❑ Details to be discussed in Reliable Operations Workstream

Updated Tariff Language

Prior to the Service Commencement Date of a Large Load, a Large Load Customer must provide real-time telemetry for all Large Load Equipment, either directly, through the applicable Transmission Owner, or other Transmission Provider-approved communication path, in the form and manner as set forth in the Business Practices Manual for Large Load.

Individual metering will be required for all Large Load Equipment and generation resources meeting thresholds outlined in the Business Practices Manual for Large Load. All telemetry shall be provided via ICCP and must meet Transmission Provider update requirements as specified in the Business Practices Manual for Large Load. The Large Load Customer must use commercially reasonable efforts to maintain telemetry availability and accuracy for the Large Load and must promptly correct erroneous data, bad mappings, and ICCP modeling issues.

The Transmission Owner must provide disturbance monitoring and event recording capability sufficient to support post-event analysis, model validation, and reliability assessment.

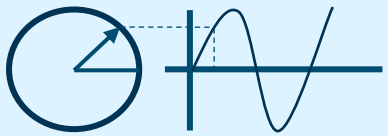
Phasor measurement unit (PMU) requirements updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Ownership and Placement	PMUs must be owned by the Transmission Owner and installed on the high-side of the interconnection transformer	√	
Applicability	PMU requirement applies primarily to oscillatory or fast-varying loads; avoid universal application across all large loads	√	
Device Requirement	Replace requirement with “PMU or better” to future-proof monitoring capability	√	
Sampling and Data Quality	Sampling rates must support oscillation detection (e.g., ≥30 sps)		√

BPM: Business Practice Manual

Phasor Measurement Unit Requirements

Phasor Measurement Requirements



- Invest in Phasor measurement unit (PMU) or better
- Details related to measured quantities, data recording and retention, power quality, and infrastructure to be discussed in Reliable Operations Workstream

Updated Tariff Language

Large Load comprised of any Computational Load shall be subject to the Phasor Measurement Unit (PMU) requirements set forth in this section. Prior to the Service Commencement Date of a Large Load, phasor measurement recording and communications equipment must be installed that is capable, at a minimum, of gathering phasor measurements as specified in Business Practices Manual for Large Load. To the extent similar quality equipment is being added or already exists, such as relays or digital fault recorders, that can collect data at least at the same rate as PMU and which data is synchronized via a high-accuracy satellite clock, such equipment may be utilized to satisfy this requirement if the equipment is located on the Transmission Owner's side of the Point of Withdrawal. The phasor measurement equipment must be installed at the Transmission Owner's side of the Point of Withdrawal and become part of the Transmission Owner interconnection facilities. Phasor measurements must be streamed in Institute of Electrical and Electronics Engineers (IEEE) C37.118 or equivalent format and be provided to the Transmission Provider by the Transmission Owner.

Short-term forecasting requirements updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Forecast Submission	Large Load Customer must submit Day-Ahead and Real-Time forecasts; must reflect most current expected demand	√	
Confidentiality	Strong protections required due to sensitivity of operational forecasts		√
Accuracy and Deviation	Stakeholders request accuracy expectations and clear deviation treatment; further work needed		√
Avoiding Duplication	Must align with existing LSE processes and avoid duplicating current DA/RT forecasting pathways		√

BPM: Business Practice Manual | LSE: Load Serving Entity | DA/RT: Day-ahead/Real-time

Short-term Forecasting Requirements

Forecasting Requirements



- **Rationale:** Large Loads can change system conditions rapidly, and unlike traditional demand, their behavior cannot be forecasted accurately using historical load patterns, even when modeled with weather and calendar data in MISO's short-term forecasting system.
- Requirements include short-term components

Updated Tariff Language

The Large Load Customer must provide day(s) ahead and real-time Load Forecasts for a Large Load directly to the Transmission Provider to support the Reliability Assessment Commitment (RAC) and Security Constrained Economic Dispatch (SCED) processes, along with other reliability studies. Given the sizable reliability impact a Large Load may have on the Transmission System, the Load Forecasts shall be updated to reflect the most current information on the expected Demand, in accordance with the Business Practices Manual for Operations Forecasting.

Ride-through Requirement



Ride-through requirements updated based on stakeholder feedback

Theme	Element	Tariff Change	BPM
Applicability and load differentiation	Comments request differentiation between computational and traditional industrial loads, noting industrial facilities may not feasibly meet ride-through expectations due to motors, VFDs, process equipment, safety systems, environmental controls, and manufacturer settings. Requests were made for load-specific treatment supported by demonstrated system need.	√	
Technical basis and standards alignment	Comments support alignment with PRC-029 and IEEE 2800 while requesting technical justification for applying generator/IBR-based concepts to loads and clearer load-specific rationale.		√
Implementation details (curves, measurement, compliance)	Comments request labeled quantitative ride-through curves, clarification of measurement points, tolerances, compliance assessment, BPM maturity, stakeholder update process, and clear implementation expectations.		√

BPM: Business Practice Manual | LSE: Load Serving Entity | DA/RT: Day-ahead/Real-time

Large Load Ride-through Requirements

Ride-through



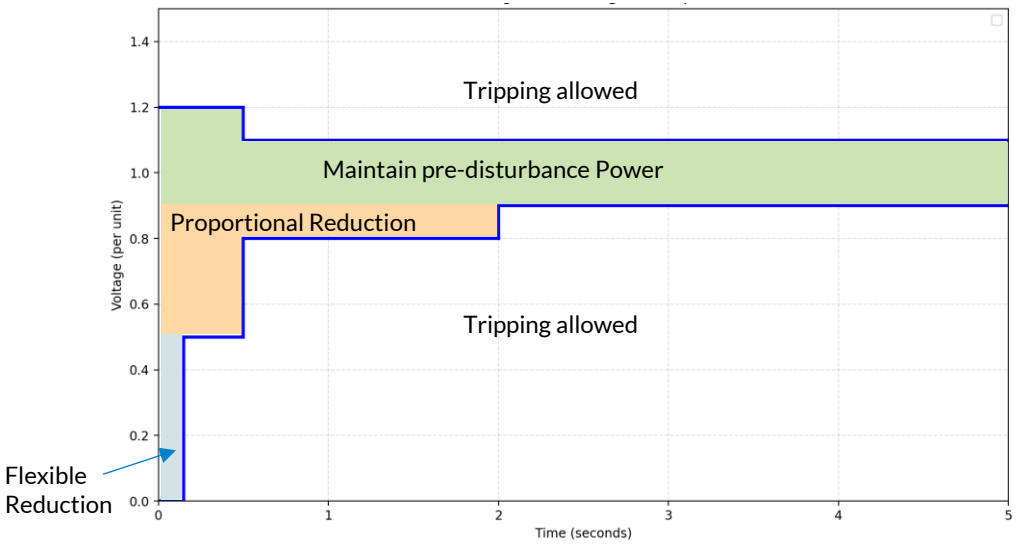
- ❑ Maintain Large Load connectivity during applicable voltage and frequency disturbances to support Bulk Electric System reliability
- ❑ Requirements include both voltage and frequency ride-through performance criteria

Draft Tariff Language

Computational Load that is associated with a Large Load shall remain connected to the Transmission System and continue operation during voltage and frequency disturbances within the performance criteria established by the Transmission Provider in the Business Practices Manual for Large Load.

Ride-through requirements apply at the Point(s) of Withdrawal and may include evaluation, testing, modeling, monitoring, and other compliance measures established by the Transmission Provider in the Business Practices Manual for Large Load.

Large Load Voltage Ride-through Technical Compendium



0.90 – 1.20 pu	**CONTINUOUS RANGE**	Maintain pre-disturbance active power. Control stability is mandatory. No power reduction is permitted between 0.9 and 1.2 pu.
0.50 – 0.90 pu	**MANDATORY RECOVERY**	Active power reduction is permitted but must be proportional. Following voltage recovery above 0.90 pu, restoration of ≥90% power is required within 1s of recovery.
< 0.50 pu	**STABILITY PRIORITY**	Flexible power reduction is allowed to maintain synchronization.

Phase Jump

Remain connected for sudden phase angle changes up to 25° .

V/Hz Limit

Ride through 1.1 pu for 45s or 1.18 pu for 2s.

Consecutive

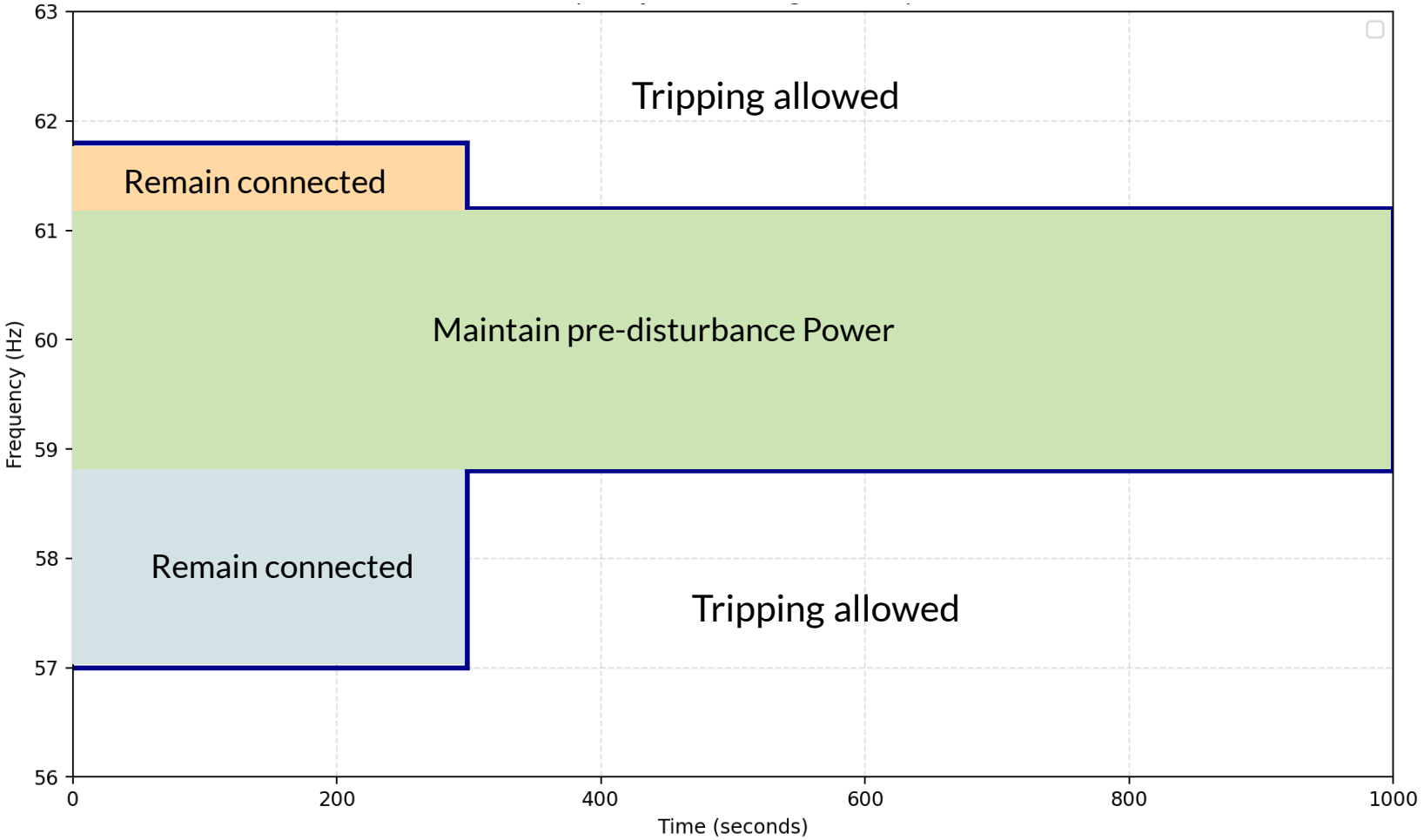
Must handle consecutive voltage disturbances, including at least three events within 10 seconds

Transient VRT

No tripping for normal system events like faults or switching

Large Load Frequency Ride-through Technical Compendium

Envelope, Compliance and Recovery



61.2 – 61.8 Hz

Maintain active power within ±10% of pre-disturbance levels

58.8 – 61.2 Hz (Normal Operation)

Maintain pre-disturbance active power

57.0 – 58.8 Hz

Maintain active power within ±10% of pre-disturbance levels

RoCoF Ride-Through

Remain connected for frequency within frequency ride-through envelop when |RoCoF| ≤ 5.0 Hz/s; coordinate protection with system reliability.

Next Steps



Review drafts on requirements and discuss tariff language

LLWG Meeting:

June 10, 2026



Provide informal feedback on today's content

Due: June 17, 2026



Final Tariff language review

LLWG Meeting:

June 29, 2026



File Tariff

June 30, 2026



Send questions or comments to:

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