



# LMR Enhancements

RASC-2019-9

August 20, 2025

Resource Adequacy Subcommittee

# Purpose and Key Takeaways



**Purpose:** Present final Tariff language for the upcoming LMR filings that will change rules regarding replacement, test deferral, and penalties

## Key Takeaways

- Replacement and other changes – effective PY 2026/2027
  - Criteria for LMR replacement
    - Catastrophic Generator Outage has been added
  - Test deferral provisions
  - New LMR only baseline methodology to support easier assessment for MPs of LMRs performance
- Penalty provisions – effective PY 2026/2027
  - BTMG will be permitted to identify planned outages, with restrictions, at the time of registration to avoid penalties for being unavailable
  - The addition of an Auction Clearing Price penalty remains
- Final proposed Tariff language is being presented – stakeholders will have an opportunity to provide feedback, and MISO will post the to be filed Tariff language at the October RASC

# Overview of LMR and Demand response filings

Topic/Effort	Key Objectives of FERC Filing	Anticipated Filing Date	Anticipated Effective Date
Demand Response Participation Rules Enhancements	<ul style="list-style-type: none"> <li>Address issues identified by FERC Office of Enforcement and IMM with respect to Demand Response Resources (DRRs) and Load Modifying Resources (LMRs) currently participating in MISO's Markets</li> </ul>	Filed March 21, 2025 ER25-1729	July 19, 2025 <b>Accepted</b>
Dual Registration of EDRs	<ul style="list-style-type: none"> <li>Eliminate dual registration for EDRs as a LMR and/or DRR to align the incentive signals sent by the participation options</li> </ul>	Filed April 25, 2025 ER25-2050	July 19, 2025 <b>Accepted</b>
Demand Response and Emergency Resources Reforms (formerly known as LMR Reforms)	<ul style="list-style-type: none"> <li>Improve availability, operational effectiveness, and accreditation of demand response and emergency only resources to allow earlier access during emergency conditions based on notification times</li> <li>Key elements: i) Participation Options, ii) Measurement &amp; Verification Baseline methodology, iii) Accreditation, iv) Real-time availability, v) MISO Initiated Testing</li> </ul>	Filed April 4, 2025 ER25-1886	September 1, 2027
LMR Testing Rules	<ul style="list-style-type: none"> <li>Provide a standard, clear testing requirement for Demand Resources participating in the PRA</li> <li>Resources without contracts overseen by regulatory authorities will be required to test 2026 / 2027 PY</li> <li>Resources without explicit testing waivers approved by regulatory authorities will be required to test in 2027 / 2028 PY</li> </ul>	Filed July 14, 2025 ER25-2845	July 15, 2025 <b>Effective pending FERC approval</b>
LMR Participation Rules Enhancements	<ul style="list-style-type: none"> <li>Clarify when and how MPs can replace LMRs during a Planning Year</li> <li>Test Deferral</li> </ul>	Separate, simultaneously filed, 2025	March 1, 2026
	<ul style="list-style-type: none"> <li>Update non-performance penalties</li> </ul>		June 1, 2026

# Changes applicable 2026 /2027 PY Subject to FERC Acceptance

Filing	Changes that apply to 2026 / 2027 PY
DRR Rules Enhancements <b>Accepted</b>	<ul style="list-style-type: none"> <li>• Increased clarity regarding qualification requirements for LMRs</li> <li>• Increased data submission requirements after a deployment</li> <li>• Measurement and Verification explicitly approved by MISO</li> </ul>
LMR Testing Rules* <b>Effective pending FERC approval</b>	<ul style="list-style-type: none"> <li>• Resources will need to provide a real power test unless overseen by a regulatory authority                              Testing, Data submission at the time of registration, and Accreditation to provide clarity and standardization</li> <li>• Aggregations may continue to use the FSL baseline until 28 / 29 subject to restrictions</li> <li>• Changes to credit requirements for resources electing a waiver to reflect Ex-Post Real-Time LMP price floors</li> </ul>
LMR Participation Rules Enhancements (To be filed)	<ul style="list-style-type: none"> <li>• Demand Resource Deferral Notice changes                             <ul style="list-style-type: none"> <li>• Resource must begin operations prior to March 1 to qualify</li> <li>• Test must be performed prior to the start of the Season rather than the Planning Year</li> </ul> </li> <li>• LMR will be permitted to replace under certain conditions</li> <li>• LMR penalties strengthened for non-performance and under-performance Penalties</li> </ul>
Dual Registration of EDRs <b>Accepted</b>	<ul style="list-style-type: none"> <li>• Dual-registration of EDR and LMR no longer permitted</li> </ul>

# Changes applicable 2027 /2028 PY Subject to FERC Acceptance

Filing	Changes that apply to 2027 / 2028 PY
LMR Testing Rules	<ul style="list-style-type: none"><li>• All resources will be required to perform a real power test unless explicitly exempted by a regulatory authority</li><li>• Credit requirement for all resources adjusted to permit a waiver anytime a resource has fully met its performance obligations when issued Scheduling Instructions and has not experienced a change in operations</li><li>• When MISO-initiated testing begins, MISO-initiated tests will count towards the requirement to obtain a testing waiver</li></ul>

# Changes applicable 2027 /2028 PY Subject to FERC Acceptance

Filing	Changes that apply to 2028 / 2029 PY
Demand Response and Emergency Resources Reforms (formerly known as LMR Reforms)	<ul style="list-style-type: none"> <li>Changes to the participation options                             <ul style="list-style-type: none"> <li>LMR split into LMR – Type I, LMR – Type II</li> <li>Creation of Non-Emergency BTMG</li> <li>Removal of dual-registration of any kind</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Measurement &amp; Verification Baseline methodology                             <ul style="list-style-type: none"> <li>FSL no longer permitted to aggregate</li> <li>Inclusion of Statistical Interval M&amp;V</li> <li>Data submission requirement for the entire Planning Year</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Accreditation                             <ul style="list-style-type: none"> <li>Accreditation determined by real time availability brings LMR accreditation into alignment with Schedule 53A Resources</li> <li>Accreditation split into multiple parts for each participation option/resource type to properly capture capability</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Real-time availability                             <ul style="list-style-type: none"> <li>Real-time availability changes emphasis accurate availability information for all resource types improving reliability</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>MISO Initiated Testing                             <ul style="list-style-type: none"> <li>Ensure resources are testing periodically ensuring resources can respond to a Scheduling Instruction</li> <li>Provides additional checks on resources ability to provide useful Demand reduction</li> </ul> </li> </ul>

# Preliminaries

- Generating facilities that are behind the meter participate in the PRA voluntarily – there is no requirement for a BTMG to participate in the PRA nor be under any obligations to MISO
- A BTMG may participate as a DRR – Type II or Qualifying Facility and receive equal accreditation as a Generation Resource
  - DRR – Type II accreditation is capped at the value of the load served unless the BTMG is willing to obtain firm Transmission Service to deliver the BTMG for the entire Season
  - Qualifying Facilities must meet the same requirements as a Generation Resource to be accredited as a Generation Resource
- If a BTMG has an Emergency only obligation, it is appropriate it receive accreditation as an Emergency only resource and be held responsible for performing during Emergencies
  - MISO will permit Planned Outages, with restrictions, to avoid the accreditation penalties for being unavailable during Planned Outages

# LMR Penalties

Effective PY 2026/2027

# LMR Penalties - Applicability

LMRs are subject to performance penalties for one of two reasons:

1. The LMR has not met its minimum performance obligations, was unavailable, and was not replaced
  - A Demand Resource that is unavailable and is consuming no Demand is exempt from this provision
  - BTMG that are required, for NERC compliance reasons, to have a planned outage submitted in CROW are exempt from this penalty when unavailable – resources with this requirement should provide evidence as such during the time of registration
  - BTMG that identify planned outages at the time of registration will be exempt for penalties applied for reasons of unavailability
    - Planned outages may only be taken between March 1 and May 15 or September 15 and November 30
    - Planned outages may not last longer than 31 days – planned outages lasting longer must use the replacement option
    - A resource must submit 0 availability in the DSRI while on outage, if a resource has submitted availability, it will be subject to penalties for underperformance
  - Resources that have met the minimum number of required Scheduling Instructions required (5x Summer/Winter, 3x Spring/Fall)
    - This will be reduced to one time per Season under the DR/ER Reforms
2. The LMR provided less Demand reduction than it submitted as available to the DSRI
  - This means an LMR that was registered at 10 MW, submitted 5 MW of Demand reduction capability at the time the SI was issued would only be subject to penalties if providing less than 5 MW of Demand reduction
    - MISO applies a Tolerance Band based on the type of M&V being used, performance within the Tolerance Band will not be subject to penalties
    - Even if on a scheduled planned outage, if a BTMG states it is available in the DSRI it will be subject to penalties

# Performance that will not be penalized

- Performance meeting or exceeding the submitted value in the DSRI will not be penalized
  - A resource does not need to perform to its registered capabilities
  - MISO and the IMM will monitor availability to ensure MPs are not abusing the submitted availability
- An LMR that has stated it can respond and does not meet the value submitted in the DSRI is subject to penalties
  - Force Majeure is the only available exemption
- A resource will be subject to penalties if unavailable and it has not responded to at least one event
  - If an LMR cannot respond due to Force Majeure it will not be penalized
  - BTMG may take planned outages to avoid penalties under the conditions established above
  - A Demand Resource that is operating at or below its FSL, or the equipment used to achieve the Demand reduction is off-line, such as Air Conditioning programs on a cool day, will not be subject to penalties provided they indicated such in the DSRI
- A resource that has Self Scheduled will have performance measured based on the Self Schedule

# Penalty Examples – BTMG (Cleared as a 12 MW LMR)

Scenario	HE 17	HE 18	HE 19	HE 20	Auction Penalty <sup>3</sup>	DR/ER Reforms Accreditation
Offered Amount	8	9	9	8		
BTMG fully responds	8	9	8.2	8	-	100% for these Hours
RT Penalty	-	-	-	-	-	-
BTMG partially fails	0	5	8.2	8	35% ACP	65% for these Hours <sup>4</sup>
RT Penalty	LMP*(8-0); \$8,000 minimum \$80,000 maximum	LMP*(9-5); \$4,000 minimum \$40,000 maximum	-	-	-	-
BTMG has not offered, but did not replace	0	0	0	0	100% ACP	0% for these Hours
RT Penalty	-	-	-	-	-	-
BTMG has not offered and did replace	0	0	0	0	0	0% for these Hours
RT Penalty	-	-	-	-	-	-

<sup>3</sup> Auction Clearing Penalty is the amount of reduction achieved divided by amount of reduction expected (MWh)

<sup>4</sup> This is equal to 22 MW Accredited (5 + 9 + 8) out of 34 MW possible (8 + 9 + 9 + 8)

## Penalty Examples – DR (Cleared as a 12 MW LMR)

Scenario	HE 17	HE 18	HE 19	HE 20	Auction Penalty <sup>5</sup>	DR/ER Reforms Accreditation
Offered Amount	8	9	9	8		
DR fully responds	8	9	8.2	8	-	100% for these Hours
RT Penalty	-	-	-	-	-	-
DR fully fails	0	5	8.2	8	100% ACP	65% for these Hours <sup>3</sup>
RT Penalty	LMP*(8-0); \$8,000 minimum \$80,000 maximum	LMP*(9-5); \$4,000 minimum \$40,000 maximum	-	-	-	-
DR has not offered, but did not replace	0	0	0	0	100% ACP	0% for these Hours
RT Penalty	-	-	-	-	-	-
DR has not offered and did replace	0	0	0	0	0	0% for these Hours
RT Penalty	-	-	-	-	-	-

12 <sup>5</sup> Auction penalties determined based the worst shortfall hour (MW)

# LMR Enhancements

Effective PY 2026/2027

# LMR Replacement Overview

- LMR replacement may not be made after the fact
    - If a resource is penalized, it may not use replacement to avoid the penalties
    - After the fact replacement does not improve the reliability concerns that resulted in the resource being penalized
  - Resources must replace at least two (2) weeks in advance
    - This aligns with the requirements for Generation Resources to replace
  - A resource that is being used to replace assumes the performance obligations of the resource being replaced
    - If replacing with an LMR, there is an Emergency obligation
    - If replacing with a Generation Resource, there is a Day-Ahead “must offer” obligation
- BTMG Replacement Eligibility Criteria
    - All Outages
    - [Catastrophic Generator Outage<sup>2</sup>](#)
    - Environmental restrictions
  - DR Replacement Eligibility Criteria
    - Change in ownership of end-use facility
    - RERRA action resulting in the termination of a contract
  - IMM approval may be sought to enable replacement for other reasons

<sup>14</sup> <sup>2</sup>MISO’s position as stated in MISO’s reply to ER25-37 for the current replacement rules is; “None of the Tariff permitted conditions for ZRC replacement apply to LMRs.” MISO will permit BTMG to replace under the Catastrophic Generator Outage rules under this proposal.

# Demand Resource Deferral Notice Changes

- Change the date the test must be performed by the last Business Day of the Season prior to the Season the resource has cleared
  - i.e. the last Business Day of August before participating in the Fall
- Failure to demonstrate registered demand reduction will result in a charge equal to:  
$$\text{shortfall} * (\text{ACP} + \text{Daily Cone})$$
for each Day of the Season(s) the resource cleared.
- The Demand Resource Deferral Notice is only available to resources currently operating that either cannot perform the test by the registration date or anticipate an increase in operations after the PRA
  - A resource must be able to provide operational data prior to March 1 to qualify for the deferral
- Demand Resources that begin operations after the registration deadline will not be permitted to participate in the PRA but may be used to replace ZRCs after undergoing a valid self-test

# New Hourly-Ahead Baseline method

- Market Participants have expressed concerns with the calculated baseline and its applicability to LMRs
- To address these concerns the same M&V used for Emergency Demand Resources has been provided in Attachment TT for use only by Demand Resources registered as Load Modifying Resources
  - Resources dual registered as DRR will not be permitted to use this baseline
- This M&V takes Demand at the time the Scheduling Instruction is issued as the baseline
- Load reduction is determined by comparing to the Demand being consumed at the time of the Scheduling Instruction
- This provides a direct M&V based on real-time load conditions and addresses concerns by stakeholders regarding how the 10-in-10 baseline works with LMRs, given that many LMRs are consuming more Demand during Emergencies than they normally would be, resulting in the 10-in-10 underestimating the Demand reduction occurring

# Stakeholder Feedback Request

- Feedback is due September 10
  - MISO is taking feedback on the Tariff redlines only
- Feedback requests and responses are managed through the Feedback Tool on the MISO website:  
[misoenergy.org/stakeholder-engagement/stakeholder-feedback/](https://misoenergy.org/stakeholder-engagement/stakeholder-feedback/)



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# Appendix

# LMR Penalties Overview

- Partial Failure and Complete Failure to perform defined
  - Differentiated by DR and BTMG to account for different characteristics
  - Demand failures measured by the reduction provided by the first Hour and the ability to hold the reduction for four hours
  - BTMG failures measured by amount of Energy produced relative to the total Scheduling Instruction issued
  - A resource that has not met its minimum performance obligations is subject to a complete failure to perform
- ACP Penalties
  - ACP penalties are included to ensure the penalties are strong enough
  - Currently, in the most extreme case a resource will be subject to penalties equal to about half of the auction revenue collected
  - The incentive is for resources to be registered without concern on their ability to deploy as the probability of deployment is low and penalties for failure to perform still result in substantial profits
- Disqualification
  - A resource will be disqualified after two performance failures for the remainder of the Planning Year and for the next Planning Year and will be subject to Capacity Replacement Non-Compliance Charges for any Seasons after the Season it has been disqualified in, for which it has Cleared ZRCs

# LMR Penalties – Consequences

- For a resource experiencing a partial or complete failure to perform, the same Real-Time penalties currently imposed will be applied
- MISO will include a penalty to the ACP to be charged at the end of the Season

$$ACP \text{ Penalty} = (\text{shortfall percent})(\text{cleared ZRC})(\# \text{ days Season})(ACP) \left( 1 - \frac{\# \text{ times performed}}{\# \text{ times called}} \right)$$

- A resource may be disqualified after the first complete failure to perform if there is no indication that the resource even attempted to perform
- For a resource experiencing two complete failures to perform in the same Season, this penalty will be changed to ACP plus daily CONE and the resource will be disqualified for the remainder of the Planning Year and for the next Planning Year

$$ACP \text{ Penalty} = (\text{shortfall percent})(\text{cleared ZRC})(\# \text{ days Season})(ACP + \text{Daily CONE}) \left( 1 - \frac{\# \text{ times performed}}{\# \text{ times called}} \right)$$