Manual No. 009

Business Practices Manual

Market Monitoring and Mitigation

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Revision History

Doc Number	Description	Revised by:	Effective Date
BPM-009-r23	Annual review completed, no changes.	D. Grethen	AUG-30-2024
BPM-009-r22	Additional Seasonal Resource Adequacy revisions. New elective consultation process in section 11.1 for permission to use the emergency commitment status for reasons other than those newly added to Module C.	D. Grethen, T. Martin, C. Milton	AUG-31-2023
BPM-009-r21	Seasonal Resource Adequacy Revisions. Other review and revisions.	M. Chiasson, T. Martin, D. Grethen, E. Thoms C. Hansen, M. Kessler	JAN-17-2023
BPM-009-r20	Electric Storage Resource Revisions. Replaced many instances of “Generation Resource” with more general “Resource” term throughout document.	M. Chiasson, J. Fogarty, C. Hansen, B. Peters	JUN-06-2022
BPM-009-r19	Review and revisions.	D. Malabonga	JUL-09-2021
BPM-009-r18	Annual review completed and revisions made to reflect the implementation of the Short-Term Reserve product. Substantive revisions made to the following sections: 5.1.1 Economic Withholding 5.1.5 Other Categories of Conduct 6.2 Physical Withholding Conduct Thresholds for Planning Resources 6.4 Economic Withholding Conduct Thresholds for Energy in Broad Constrained Areas 6.7 Economic Withholding Conduct Thresholds for Operating Reserve in Reserve Zones 6.9 Reference Levels 7.3 Price Impact Threshold for Operating Reserves and Off-Line Short-Term Reserve in a Reserve Zone 8.1 Default Offers 8.2 Penalty Charges 10.1 Market Monitoring Plan Data Provided by MISO 11.2 Notifications to MPs 11.5 Reports	M. Flagg	JUL-09-2021
BPM-009-r17	Revision to section 5.1.6 to reflect potential penalties for extended outages/derates in the June-September period	T. Bachus	DEC-28-2020

BPM-009-r16	Annual review completed and revisions to reflect recent Module D modifications. Revised sections include: 3.3 Reliability Assessment Commitment Process 3.4 Financial Transmission Rights Market 5.5 Physical Withholding 5.5 Economic Withholding 5.1.3 Uneconomic Production 5.2.1 Narrow Constrained Areas 5.2.4 Broad Constrained Areas 6.1 Physical Withholding Conduct Thresholds for Generation Resources 6.2 Physical Withholding Conduct Thresholds for Planning Resources 6.3 Physical Withholding Conduct for Transmission Facilities 6.4 Economic Withholding Conduct Thresholds for Energy in Broad Constrained Areas 6.5 Economic Withholding Conduct Thresholds for Energy in Narrow Constrained Areas 6.7 Economic Withholding Conduct Thresholds for Operating Reserve in Reserve Zones 6.8 Uneconomic Production Conduct Thresholds 6.9 Reference Levels 6.9.1 Methods to Calculate Reference Levels 6.9.2 Fuel Price Adjustments and Other Reference Level Considerations 6.9.3 Calculation of Operating Reserve Market Reference Levels for The First 90 Days of The Operating Reserve Market 6.9.4 Calculation of Planning Resource Reference Levels 7.3 Price Impact Threshold for Operating Reserves in A Reserve Zone 8.2 Penalty Charges 8.2.1 Determination of Base Penalty Charge 10.2 Market Monitoring Information Provided by MPs, TOs, And Local Balancing Authority Operators 11.2 Notifications to MPs 13 Appendix	M. Flagg	JUL-09-2020
BPM-009-r15	Annual Review completed. Revised Sections 8.1.3 and 8.1.4 to update language related to impact tests.	A. Thatte	JUL-09-2019

BPM-009-r14	Updated Section 6.9.1 to clarify Reference Level adjustments related to equipment testing and other events; updated list of acronyms to include CROW and OCS; made minor capitalization and terminology changes.	A. Thatte	FEB-01-2019
BPM-009-r13	Updated for new DNCA authority. Annual Review completed. Updated the website links.	A. Thatte	JUL-05-2018
BPM-009-r12	Annual Review completed. Revised sections 6.2 and 6.4 to clarify physical and economic withholding provisions for the Planning Resource Auction. Also updated section 6.9.4 and 7.4 to reflect Module D changes.	A. Thatte	JUL-15-2017
BPM-009-r11	Added clarifications to mitigation process (consultation and notification), and specified MPs' responsibility to regularly monitor Reference Levels. Also changed "Regulating Reserve Offers" in section 6.7 to "Regulating Capacity Offers".	A. Thatte / L. Ashley	JAN-15-2017
BPM-009-r10	Updated sections 11.5.1 and 11.5.2 to reflect updated timeframes for MISO responses to IMM recommendations. Annual Review completed.	L. Ashley	JUN-30-2016
BPM-009-r9	Modifications regarding the mitigation of RSG MWP mechanisms in BCAs and NCAs, per 04/28/2015 Section 205 Filing in Docket No. ER15-1571-000. Annual Review completed.	A. Alewine / L. Ashley	JUN-30-2015
BPM-009-r8	Annual Review completed.	L. Ashley	JUN-03-2015
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MO-BPM-004-r3	Reviewed by the Tariff and Business Practices Subcommittee	Michael Chiasson, P. Sircar	NOV-12-2009
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	Edited inserted sections of the application of Mitigation Measures associated with the Resource Adequacy Requirements Voluntary Capacity Auctions Revised to incorporate the application of Mitigation Measures associated with the Resource Adequacy Requirements Voluntary Capacity Auctions		
MO-BPM-004-r1	Revised to reflect the Open Access Transmission, Energy and Operating Reserve Markets Tariff for the Midwest ISO, Inc. (Tariff) relating to implementation of the Day-Ahead and Real-Time Energy and Ancillary Services Markets and to integrate proposed changes to the Balancing Authority Agreement.	P. Sircar	JAN-06-2009
MO-BPM-004	Format changes in compliance with control document procedures and logo templates	P. Grattenthaler, P. Sircar	APR-01-2008
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N/A	Revisions were made in the following sections: Section 5.2.1 Narrow Constrained Areas Section 6.6 Reference Levels Section 6.6.1 Methods to Calculate Reference Levels Section 6.6.2 Additional Reference Level Considerations Section 8. Application of Default Offers, Penalty Charges, Load Measures and Virtual Transaction Measures Section 10.1 Consultation with MP's Section 12 Two-Month Transition Period	M. Robinson, Potomac Economics	AUG-08-2005
N/A	Revisions were made in the following sections: ▪ Section 6.1 Physical Withholding Conduct Thresholds for Generation Resources ▪ Section 8. Application of Default Offers, Penalty Charges, Load Measures and Virtual Transaction Measures ▪ Section 8.1.1 Substituting Default Offers Day-Ahead ▪ Section 8.1.2 Substituting Default Offers in Real-Time ▪ Section 8.4.3 Determining Virtual Transaction Measures ▪ Section 10.2 Notifications to MPs ▪ Section 10.3 Notification to FERC	M. Robinson, KEMA Consultants	JAN-14-2005

	▪ Section 12 Two-Month Transition Period Minor revisions were also made in other sections		
N/A	Revised to reflect the October 5, 2004 Energy Markets Tariff (EMT) Compliance Filing.	M. Robinson	DEC-15-2004
N/A	Original document	M. Robinson	JUL-15-2004

Contents

List of Exhibits:

1. Introduction

This introduction to the Midcontinent Independent System Operator, Inc. (MISO) *Business Practices Manual (BPM) for Market Monitoring and Mitigation* includes basic information about this BPM and other MISO BPMs. The first section (Section 1.1) of this Introduction provides information about the MISO BPMs. The second section (Section 1.2) is an introduction to this BPM. The third section (Section 1.3) identifies other documents in addition to the BPMs, which can be used by the reader as references when reading this BPM.

1.1 Purpose of the MISO Business Practices Manuals

The BPMs developed by MISO provide background information, guidelines, business rules, and processes established by MISO for the operation and administration of the MISO markets, provision of transmission reliability services, and compliance with the MISO settlements, billing, and accounting requirements. A complete list of MISO BPMs is available for reference through MISO's website. All definitions in this document are as provided in the MISO Tariff, the NERC Glossary of Terms Used in Reliability Standards, or are as defined by this document.

1.2 Purpose of this Business Practices Manual

This *BPM for Market Monitoring and Mitigation* describes the role of the Independent Market Monitor (IMM) in implementing the Market Monitoring and Mitigation Plan and how the Plan affects Market Participants (MPs).

MISO prepares and maintains this *BPM for Market Monitoring and Mitigation* as it relates to the reliable operation of the MISO region. This BPM conforms and complies with the Agreement of Transmission Owners to Organize MISO, Federal Energy Regulatory Commission (FERC) Order 2000, MISO's Tariff, North American Electric Reliability Corporation (NERC) (also known as the Electric Reliability Organization (ERO)) operating policies, and the applicable Regional Entity or Regional Reliability Organization (RRO) reliability principles, guidelines, and standards, and is designed to facilitate administration of efficient Energy and Operating Reserve Markets. This BPM is intended to be entirely consistent with the MISO Tariff which is the controlling document.

This BPM benefits readers who want answers to the following questions:

- What are the responsibilities of the IMM?
- What are the specific thresholds of Conduct and Impact that trigger Mitigation Measures?
- How are Default Offers substituted, Penalty Charges calculated, and other Mitigation Measures imposed?
- What MP data is routinely provided to the IMM?
- How is the confidentiality of the MP data assured?

1.3 References

Other reference information related to this BPM includes:

- Tariff of MISO
- IMM State of the Market Reports
- Other BPMs

1.4 List of Acronyms

ACP: Auction Clearing Price
AMP: Automated Mitigation Procedure
ATC: Available Transfer Capability
BCAs: Broad Constrained Areas
CGSFC: Constraint Generation Shift Factor Cutoff
CONE: Cost of a New Entry
CRNCC: Capacity Replacement Non-Compliance Charges
CROW: Control Room Operations Window
DAMAP: Day-Ahead Margin Assurance Payments
DNCA: Dynamic Narrow Constrained Area
DRRs: Demand Response Resources
ERO: Electric Reliability Organization
FERC: Federal Energy Regulatory Commission
FTRs: Financial Transmission Rights
GFC: Going Forward Costs
GSFs: Generation Shift Factors
IMM: Independent Market Monitor
ICAP: Installed Capacity
LBAs: Local Balancing Authorities
LMPs: Locational Marginal Prices

LSE: Load Serving Entity
MCPs: Market Clearing Prices
MMM: Market Monitoring and Mitigation
MP: Market Participant
NCAs: Narrow Constrained Areas
NDAs: Non-Disclosure Agreements
NERC: North American Electric Reliability Corporation
NRIS: Network Resource Interconnection Service
OCS: Operating Cost Survey
OD: Operating Day
OH: Operating Hour
OR: Operating Reserve
PRA: Planning Resource Auction
PRMR: Planning Reserve Margin Requirement
PVMWP: Price Volatility Make-Whole Payments
RAC: Reliability Assessment Commitment
RAR: Resource Adequacy Requirements
RRO: Regional Reliability Organization
RSG MWP: Revenue Sufficiency Guarantee Make-Whole Payments
RTOs: Regional Transmission Organizations
RTORSGP: Real-Time Offer Revenue Sufficiency Guarantee Payments
SAC: Seasonal Accredited Capacity
SCED: Security-Constrained Economic Dispatch
SCUC: Security-Constrained Unit Commitment
STR: Short-Term Reserve
SE: State Estimator
TLF: Transmission Loading Relief
TOs: Transmission Owners
UCAP: Unforced Capacity
VLR: Voltage and Local Reliability
ZRC: Zonal Resource Credit

2. Overview of Market Monitoring and Mitigation and an Explanation of Actions that can be taken

This section explains the goals and reasons for implementing Market Monitoring and Mitigation (MMM) and the actions available to prevent problems from occurring and to sanction anti-competitive behavior**.**

2.1 Market Power Defined

Market power is the ability to raise Locational Marginal Prices (LMPs), Market Clearing Prices (MCPs), or Auction Clearing Prices (ACPs) for Planning Resources significantly[1] above competitive levels and/or unjustifiably increase the value of Revenue Sufficiency Guarantee Make-Whole Payments (RSG MWP)[2]. Market power can be exercised by an MP by withholding Capacity, output, or facilities from the market (physical withholding); by excessively raising the price or changing the value of a component of an Energy, Operating Reserve (OR), Short-Term Reserve (STR) or Planning Resource Offer (economic withholding); by failing to arrange in advance for most of its supply of Energy for a Load Serving Entity (LSE) (sustained pattern of under-bidding Load that contributes to an unwarranted divergence of the LMPs between the Day-Ahead and Real-Time Markets); or by uneconomic virtual bidding.

2.2 Purpose of Market Monitoring and Mitigation

The goal of Market Monitoring and Mitigation (MMM) is to prevent the distortion of competitive outcomes while avoiding unnecessary interference with competitive price signals. The combination of Conduct and Impact Tests used in the MMM process are the triggers for imposing the Mitigation Measures that act to preserve legitimate scarcity pricing.

2.3 Actions Available to Minimize Adverse Effects

Mitigation Measures are available under the MMM Plan (see Section 50 of the Tariff, Independent Market Monitoring Plan) that mitigate abuses of locational market power while minimizing interference with the market when it is workably competitive. Mitigation Measures mitigate specific conduct only when it exceeds well-defined conduct thresholds and when the effect on market outcomes exceeds well-defined market Impact Thresholds. Using these thresholds, the Mitigation Measures are designed to allow prices to rise efficiently to reflect legitimate supply shortages while effectively mitigating inflated prices associated with artificial supply shortages that result

[1] Suppliers in workably competitive markets have some *de minimus* power to raise prices, but it only becomes a concern when they can raise prices significantly for an extended period. The FTC Merger Guidelines, for example, use a 5% threshold for one year. Mitigation Measures should balance between guarding against the significant exercise of market power and excessive interference with markets.

[2] These include Real-Time and Day-Ahead Revenue Sufficiency Guarantee Make Whole Payments (RSG MWP), Real-Time Offer Revenue Sufficiency Guarantee Payments (RTORSGPs) and Day-Ahead Margin Assurance Payments (DAMAP).

from physical or economic withholding in transmission-constrained areas. The application of Mitigation Measures associated with the Resource Adequacy Planning Resource Auctions (PRA) is not limited to transmission-constrained areas.

The MMM process minimizes the adverse effects of market power through the use of Mitigation Measures. These measures consist of (1) the prospective substitution of Default Offers (based on reference values) for offer components of Energy, Operating Reserve, Short-Term Reserve or Planning Resource Offers that fail conduct tests and are found to have significant price impact, (2) assessing Penalty Charges, and (3) constraining certain offer behavior when an MP's conduct has caused a substantial[3] increase in Day-Ahead or Real-Time Energy and Operating Reserve Market LMPs, MCPs, PRA clearing prices, or in RSG MWPs (refer to Section 7, Impact Thresholds). These Mitigation Measures, and the conditions under which they are imposed, are specified in Module D, Market Monitoring and Mitigation Measures, of the Tariff.

The MMM process first evaluates the actions of MPs by comparing offers to resource specific Reference Levels (physical or economic). Tariff defined conduct thresholds are applied to determine whether the conduct warrants further evaluation for potential application of Mitigation Measures. If a Conduct Test fails, then the IMM performs an impact test to determine what if any effect the conduct had on LMPs, MCPs, PRA clearing prices, and/or RSG MWPs. When possible, the impact is evaluated by comparing market outcomes based on Reference Levels against those based on offers failing conduct. This is done through re-clearing the market, replacing the offers failing conduct with offers based on the references (default offers). If the difference in market outcome comparing the actual to the competitive results exceeds the tariff defined Impact Thresholds, then mitigation may be imposed.

2.4 Referral of Anti-Competitive Behavior to FERC

Actions or transactions that do not have a legitimate business purpose and that could manipulate market prices, market conditions, or market rules for electric energy or electricity products are prohibited and may in certain cases be referred to FERC by the IMM. Actions or transactions undertaken by an MP that are explicitly contemplated in the Tariff (such as virtual supply or Load bidding) or that are taken at the direction of MISO do not violate this provision.

If the IMM identifies a potential Tariff violation for which a Penalty Charge is provided (as defined in Section 65.3 of the Tariff), it is required that the IMM make recommendations to MISO for potential sanction per Section 65.3.2. For potential Market Violations the IMM will refer the issue

[3] The terms "substantial" and "substantially" appear several times in this BPM as is also the case in the Tariff. Specific thresholds for what the IMM deems to be "substantial" are described generally in Sections 5 to 8 of this BPM and specifically in Section 7, Impact Thresholds.

to FERC (see Section 8.2 below). FERC will then exercise its judgment as to whether the Tariff or an applicable regulation has been violated and the extent of any associated Penalty Charge or sanction that may be appropriate.

3 Markets and Entities Affected by Market Monitoring and Mitigation

The primary focus of Market Monitoring and Mitigation is to monitor for and mitigate against market power in constrained areas in the MISO Day-Ahead Energy and Operating Reserve Market and the Real-Time Energy and Operating Reserve Market (the Energy and Operating Reserve Markets), as well as in the Planning Resource Auction (PRA). In addition, the MMM requires the monitoring and mitigation of Uneconomic Real and Virtual Generation Offers[4], Resource Adequacy Requirements Bids, Zonal Resource Credit Offers (excluding Demand Resources, Energy Efficiency Resources and External Resources), and physical withholding of electric generation or transmission facilities from service. The MMM process is also responsible for monitoring any other markets administered, coordinated, or facilitated by the MISO, with the exception of the markets specifically excluded in Section 3.6.

All MPs registered with MISO and all owners of Electric Facilities registered with MISO are subject to market monitoring and mitigation and, if warranted under Module D, the imposition of Default Offers, Penalty Charges, or other Mitigation Measures. All entities participating in any of the Markets or taking service under, or are a party to the Tariff or agreements listed in Tariff Attachment P, including the Independent Market Monitor, Balancing Authority Operators and MISO itself, are subject to the terms of the MMM measures defined in Module D of the Tariff.

3.1 Day-Ahead Energy and Operating Reserve Market

The Day-Ahead Energy and Operating Reserve Market is a forward market in which hourly clearing prices are calculated for each hour of the next Operating Day (OD) based on the concept of LMPs and MCPs. The Day-Ahead Energy and Operating Reserve Markets are cleared using Security-Constrained Unit Commitment (SCUC) and Security-Constrained Economic Dispatch (SCED) software to satisfy Energy demand, Operating Reserve and Short-Term Reserve requirements of the Day-Ahead Energy and Operating Reserve Markets. The results of the Day-Ahead Energy and Operating Reserve Market clearing include hourly LMP values, hourly MCP values, and hourly real and virtual demand and supply quantities.

3.2 Real-Time Energy and Operating Reserve Market

The Real-Time Energy and Operating Reserve Market is a market in which the LMPs, MCPs, and least-cost dispatch schedules are determined every five minutes. The clearing using SCED is based on forecasted and MISO actual system operating conditions. The SCED dispatches

[4] Throughout this Manual, the term Generation Offer includes Start-up, No-Load and Energy Offers, Operating Reserve Offers and. Short-Term Reserve Offers.

resources to match the short-term Load Forecast and manage congestion in real-time. Resource Energy, Operating Reserve, and Short-Term Reserve Offers for use in the Real-Time Energy and Operating Reserve Market are distinct from the Day-Ahead. Real-Time LMPs and MCPs are calculated based upon actual (e.g., State Estimator (SE)) system operating conditions.

3.3 Reliability Assessment Commitment Process

The Reliability Assessment Commitment (RAC) is a process that may be conducted multiple times in the pre-day-ahead, post-day-ahead, and intra-day time periods (prior to and in parallel with the Energy and Operating Reserve Markets) using the SCUC algorithm to ensure that sufficient Resources will be available and on-line to meet Load, Operating Reserve and Short-Term Reserve requirements during the operating day. Resources committed in RAC are guaranteed to recover, at a minimum, their combined Start-Up, No-Load, Energy and Operating Reserve costs (Offer Revenue Sufficiency Guarantee Payment).

The Look-Ahead Commitment (LAC) occurs every 15 minutes, making commitment (and de-commitment) suggestions for RAC operators for 15-minute intervals for the upcoming 180-minute period. LAC has 15-minute intervals for the first two hours, 30-minute intervals for the third hour and hourly intervals for any hours beyond. The Transmission Provider can run LAC more frequently than 15 minutes and longer than 180 minutes as needed.

3.4 Financial Transmission Rights Market

Financial Transmission Rights (FTRs) are financial instruments whose values are determined by the transmission congestion charges that arise in the Day-Ahead Energy and Operating Reserve Market, leading to differences in the Marginal Congestion Components of Day-Ahead LMPs at different locations. FTRs provide a financial hedging mechanism to manage the risk of congestion cost in the Day-Ahead Energy and Operating Reserve Market. MPs who hold FTRs may potentially be protected against or liable for paying congestion charges for scheduling power injections (e.g., generation or bilateral purchases) at one location, and power withdrawals (e.g., load or bilateral sales) at a different location in the Day-Ahead Energy and Operating Reserve Market.

MISO conducts annual and multi-period monthly FTR Auctions to:

1) Allow MISO to sell FTRs for the FTR capability of the market footprint, including External Interfaces; and
2) Facilitate the buying and selling of FTRs for MPs.

MISO conducts FTR Auctions in a manner consistent with the Tariff and the standards and procedures set forth in the Business Practices Manuals. The annual FTR Auction consists of eight independent auctions performed in three different rounds: for the Peak and Off-Peak times of use of each of the four seasons. The multi-period monthly FTR Auction consists of a single market being offered with one or multiple months/seasons, and with each period having a Peak and Off-Peak time of use.

3.5 Resource Adequacy Requirement Planning Resource Auction (PRA)

The PRA is a seasonal capacity auction established to clear ZRC offers in order to satisfy 100 percent of the Planning Reserve Margin Requirement (PRMR) for each existing Load Serving Entity (LSE), less the amount of PRMR associated with the Capacity Deficiency Charge and inclusive of any resources used in a Fixed Resource Adequacy Plan (FRAP), in each Local Resource Zone (LRZ) up to the total volume of offered ZRCs.

3.6 Markets Not Monitored

Market Monitoring and Mitigation is generally concerned with any MP behavior that affects the competitiveness of the Energy and Operating Reserve Markets, or the PRA (Planning Resource Auction), and increases LMPs, MCPs, RSG MWPs or PRA clearing prices. The MMM process, however, is not directly concerned with Internal or External Bilateral Transaction Schedules, with bilateral Capacity, or with private transmission rights that are not under MISO administration, unless they affect the Energy and Operating Reserve Markets, the PRA, and services provided by MISO. The IMM will periodically assess such effects.

3.7 Local Balancing Authority Operators

In addition to MPs, Local Balancing Authorities (LBAs) are also subject to the Market Monitoring and Mitigation Plan. LBAs are not subject to enforcement action by the IMM if they are following the directives of the Electric Reliability Organization (ERO), MISO, Regional Entities or Regional Reliability Organizations, or individual state commissions.

The IMM will monitor the actions taken by LBAs, including the following:

1) Causing more units to be committed through the RAC process or other supplemental commitment processes than needed for reliability purposes;
2) Taking actions that are economically inefficient to resolve imbalances among the LBAs;
3) Redispatching Resources in a manner that is not necessary or that is inefficient to resolve local constraints or satisfy local reliability requirements;

4) Favoring Affiliates; or
5) Conduct found to have a substantial effect on market outcomes, defined as $10 per MWh on LMP prices per day or $10 per MWh on distribution of costs within a Local Balancing Authority or more than $10 per MWh on MCP prices

If substantial effect on market outcomes is found, the IMM will refer the instances to the FERC.

4 Roles of Independent Market Monitor, Market Monitoring Liaison Officer, MISO, and Market Participants

This section describes the IMM, including its independence and duties, as well as the market monitoring and mitigation responsibilities of MISO's Market Monitoring Liaison Officer, MISO, and the MPs.

4.1 Independent Market Monitor

The IMM is an organization or individual retained by MISO to impartially implement the MMM Plan. The IMM reports directly to the MISO Board of Directors and performs its market monitoring activities without interference from MISO or from state regulatory agencies. Currently, the IMM is Potomac Economics, Ltd. located in Fairfax, Virginia (telephone 703-383-0720).

Specific responsibilities of the IMM in MISO's Energy and Operating Reserve Markets and Planning Resource Auction include the following:

1. Establish the overall MMM process for each of the Energy and Operating Reserve Markets, and in the PRA;
2. Install processing and communications hardware and software to automate portions of the MMM Plan;
3. Collect data from MISO and MPs as needed to implement the MMM Plan;
4. Ensure that data is retained in usable form for any subsequently appointed IMM;
5. Monitor market operations and analyze market parameters such as generating capacity, reserve margins, generation outages, Load, Available Flowgate Capability, wholesale electricity prices, transmission constraints, transmission utilization, transmission requests and Transmission Loading Relief events/curtailments;
6. Identify Narrow Constrained Areas (NCAs), Dynamic Narrow Constrained Areas (DNCAs), and Broad Constrained Areas (BCAs);
7. Perform the Conduct and Impact Tests defined in Module D of the Tariff;
8. Identify all anti-competitive behavior by MPs;
9. Detect and mitigate attempts to exercise market power or attempts to manipulate market outcomes by MPs, Transmission Owners (TOs), Balancing Authorities, or LBAs;
10. Report instances of physical withholding and other violations to FERC and MISO as required;
11. Advise MISO and prepare reports on the nature and extent of, and any impediments to competition in and the economic efficiency of the MISO Markets and Services, submitting these reports to:

a. FERC;
b. Affected state regulatory agencies; and
c. Each CEO of an MP for which the IMM has made findings directly related to that MP's company.

12. Bring any matter to the attention of MISO, the state regulatory agencies, FERC and/or appropriate federal or state antitrust enforcement agencies as needed to achieve the purposes, objectives, and effective implementation of the MMM Plan;
13. Notify FERC and the affected state regulatory agencies of a significant market problem that may require further investigation, a change in the Tariff, or action by FERC and/or the state regulatory agencies;
14. Monitor actions by MISO, if any, that substantially distort competitive outcomes;
15. Answer complaints from MPs regarding implementation of the MMM process;
16. Respond to requests for information from FERC and state regulatory agencies;
17. Submit annual reports on the status of the Energy and Operating Reserve Markets;
18. Monitor all of the MISO markets for conduct that, while not exceeding thresholds defined in the MMM Plan, nevertheless distorts competitive outcomes, and seek authorization to mitigate this conduct;
19. Identify market design flaws;
20. Provide recommendations for improvements in the operation of the Energy and Operating Reserve Markets, the PRA and the MMM Plan to enhance market competitiveness and efficiency (including changes to market rules);
21. Recommend changes to Conduct and Impact Thresholds to improve the operation of the MMM Plan (changes must be filed with FERC);
22. Recommend changes to improve the interface with neighboring Regional Transmission Organizations (RTOs) and Balancing Authority Areas; and
23. Ensure that all monitoring and reporting activities are implemented fairly and consistently.

The IMM will achieve the purposes and objectives of this Plan by reviewing and analyzing the following:

1) The schedules and Offers submitted for, and actual dispatch of, Resources in any of the Markets;
2) Offers submitted by MPs in the Day-Ahead and Real-Time Energy and Operating Reserve Markets, as well as Virtual Bids and Offers;
3) The provision of Transmission Service rights by MISO, including estimating and posting of Available Transfer Capability (ATC), administration of the Tariff, the operation and maintenance of the Transmission System, the auctions and other markets for transmission rights, and the reservation and scheduling of Transmission Service; and
4) Resource Adequacy Requirements, Bids and Planning Resource Offers, Resource Plans, Planning Resource Credits, and bilateral capacity contract information.
5) Information relating to collusive or other anticompetitive or inefficient behavior affecting any of the Markets and Services.

The IMM will either recommend or implement Mitigation Measures as approved by FERC whenever necessary, in accord with defined criteria, including the following:

1) Substituting Default Offers to mitigate economic withholding and uneconomic production (see Section 8.1);
2) Recommending Penalty Charges (see Section 8.2); and
3) Implementing Demand Bidding restrictions and virtual bidding restrictions to address market abuses (see Sections 8.3 and 8.4).

The IMM does not have the authority to directly impose Penalty Charges. Penalty Charges recommended by the IMM may only be imposed as directed in Module D either by MISO or by FERC. Penalty Charges will then be administered by MISO.

4.1.1 Physical Withholding

Physically withholding an Electric Facility or Resource makes it partly or totally unavailable to the Energy and Operating Reserve Markets, the PRA, or the Transmission System when it would be economic to operate. Equipment legitimately scheduled or forced out-of-service is not considered to be physically withheld. Examples of physical withholding include any of the following actions:

1) Unjustifiably declaring that an Electric Facility or Resource has been derated, forced out of service, or otherwise become unavailable;
2) Refusing to submit Offers or schedules for a Resource that is capable of providing service;

3) Not submitting ZRC Offers to the PRA for Electric Facilities eligible to become Planning Resources (other than Demand Resources, Behind the Meter Generation Resources less than or equal to ten (10) MW Generation Verification Test Capacity (GVTC) that are registered as Load Modifying Resources, Energy Efficiency Resources, or External Resources) that are not designated to satisfy the capacity obligations of an LSE in MISO or exported;
4) Exporting Planning Resources to a capacity market with prevailing prices less than 50 percent of the PRA clearing price;
5) Declaring that the capability of a Planning Resource is reduced for reasons that are not true or verifiable;
6) Operating a Resource below MISO's Real-Time Setpoint Instructions;
7) Changes in physical Offer parameters which reduce Resource availability, including, but not limited to changes in:
    a) Ramp Rates;
    b) Emergency Minimum Limits;
    c) Economic Minimum Limits;
    d) Economic Maximum Limits; and
    e) Emergency Maximum Limits;
8) Changes in time-based Offer parameters, including, but not limited to changes in:
    a) Start Up Times;
    b) Minimum Run Times; and
    c) Minimum Down Times;
9) Operating a transmission facility:
    a) That is uneconomic;
    b) Not in accordance with MISO's instructions or Good Utility Practice; and
    c) In a manner that causes a Binding Transmission Constraint or Binding Reserve Zone Constraint.

4.2 Market Monitoring Liaison Officer

MISO's President is appointed as the Market Monitoring Liaison Officer. The Market Monitoring Liaison Officer has the following responsibilities:

1) Provide administrative oversight of the contract with the IMM;
2) Support the flow of data and information from MISO to the IMM;
3) Ensure that the IMM's mitigation instructions are properly carried out;
4) Coordinate MISO's response to IMM reports and recommendations; and
5) Establish the policies for ensuring the professional and financial independence of the IMM.

The Market Monitoring Liaison Officer does not impose Penalty Charges unless recommended by the IMM, does not delay the IMM's preparation of its recommendations, and does not share or discuss Confidential Information or other non-public data with unauthorized recipients.

4.2.1 Market Monitoring and Mitigation (MMM) Plan

MISO and its Board of Directors have the following responsibilities under the Market Monitoring and Mitigation (MMM) Plan:

1) Retain the IMM;
2) Appoint the Market Monitoring Liaison Officer;
3) Provide data to the IMM for routine operations and for special inquiries;
4) Respond to requests from the IMM for data or questions concerning the data;
5) Review and comment on IMM indices and screens;
6) Review, comment on and implement IMM reports and recommendations;
7) Notify MPs of Mitigation Measures and post MMM information;
8) Apply appropriate Penalty Charges and restrictions as recommended by the IMM;
9) Protect MPs' confidential data used by the IMM to perform its market monitoring and mitigation functions; and
10) Request FERC authorization to impose additional Mitigation Measures for conduct that distorts competitive market outcomes but is not triggered by existing Conduct and Impact Thresholds.

4.3 Market Participants

MPs may provide comments on the following items that are filed with FERC by the IMM:

1) The list of routine data requested by the IMM (see Section 10.2);
2) MMM indices and screens used by the IMM to assess conduct and impact levels (see Sections 5, 6 and 7);
3) Designation of an electrical area as a NCA (see Section 5.2.1); and
4) Changes to Constraint Generation Shift Factor Cutoff (CGSFC) values (see Section 5.2.3).

FERC considers comments by MPs as part of its normal procedures for processing filings. MPs are also responsible for the following actions:

1) Retain and provide information that is identified in the MMM Plan;
2) Respond to requests for specific information in support of on-going IMM investigations;
3) Regularly monitor the values of Reference levels for its Resources;
4) Initiate consultations about and request changes to Reference Levels that the IMM applies to Offers, if desired;

5) Provide explanations to the IMM in advance of submitting Offers that exceed Reference Levels; and
6) Utilize the MISO Dispute Resolution Procedures for challenging actions under the MMM Plan with which an MP disagrees, if necessary.

5 Conduct Warranting Mitigation

The MMM Plan employs a two-part test (Conduct Test plus Impact Test) to determine whether mitigation is warranted. These tests are designed to establish whether an exercise of market power substantially distorts market outcomes before Mitigation Measures are imposed.

The IMM imposes Mitigation Measures to remedy conduct that is not consistent with competitive behavior (as defined in Section 64.1 of the Tariff) and that would result in a substantial change in MISO LMPs or MCPs in either the Day-Ahead and Real-Time Energy and Operating Reserve Markets; in the Day-Ahead or Real-Time RSG MWPs paid to a Resource in any operating day (as defined in Section 64.2.1 of the Tariff); or the Planning Resource Auction (PRA) clearing prices. Prior to or subsequent to the imposition of Mitigation Measures, but as soon as practicable if warranted in light of the information available, the IMM shall contact the MP to request an explanation of the conduct (refer to Section 11.1, Consultation with MPs).

In general, the IMM considers an MP's or TO's conduct for a given Electric Facility or Resource to be inconsistent with competitive conduct if the conduct would:

1) Reduce the net revenue associated with the Resource but for the effect of the conduct on market outcomes[5], or
2) Inefficiently reduce the capability of the Transmission System[6].

These two items serve as a foundation for how market monitoring provisions are evaluated.

Mitigation Measures only apply to the facilities of MPs or TOs that are registered with MISO, although the Binding Transmission Constraints or Binding Reserve Zone Constraints that result from anti-competitive behavior may occur in neighboring areas, including the PJM Interconnection (PJM). If the IMM observes a pattern of behavior outside the MISO Region that impacts the MISO Markets, the IMM will report this behavior and its consequences to FERC. (The term "MISO Region" used in this BPM is equivalent to the "MISO Market Footprint".)

[5] For example, an MP might bid/utilize a facility in such a way as to create congestion to benefit other facilities, rights or contracts that it owns or controls. Consequently, the MMM emphasis is placed on the impact on the market and the overall advantage gained by the MP, not the revenues associated with a specific facility.

[6] For example, a TO might reduce the capability of the Transmission System by providing inaccurate transmission line ratings or taking unjustified transmission line outages.

This section describes the general categories of conduct that may trigger the Mitigation Measures (see Section 8), and defines the Narrow Constrained Areas (NCAs), Dynamic Narrow Constrained Areas (DNCAs), and Broad Constrained Areas (BCAs) that distinguish different modes of inappropriate conduct. Section 6 lists specific conduct thresholds and Section 7 describes the Impact Thresholds that anti-competitive actions must exceed to trigger Mitigation Measures.

5.1 Categories of Conduct that Warrant Mitigation

The types of conduct that may warrant mitigation are categorized in one of four ways:

1) Physical withholding;
2) Economic withholding;
3) Uneconomic production; and
4) Uneconomic Demand Bids/Uneconomic Virtual Transactions.

Mitigation Measures are only applied in response to the presence of one or more Binding Transmission Constraints or Binding Reserve Zone Constraints. This limitation shall not apply to the imposition of Default Offers on Planning Resources in the PRA. A Binding Transmission Constraint or Binding Reserve Zone Constraint occurs when a transmission line, transformer or other Electric Facility is at or above a limit and a change in the dispatch or commitment of an Electric Facility is required to relieve the limit or if meeting the reserve requirements of a defined Reserve Zone results in a change in the least cost commitment or economic dispatch. Binding Transmission Constraints may occur in adjacent areas monitored by MISO (e.g., PJM) that affect the dispatch or commitment of Electric Facilities in the MISO Region. When a transmission constraint or Reserve Zone constraint is binding, one or more suppliers may be in a position to exploit the lack of competitive alternatives.

5.1.1 Economic Withholding

Economic withholding is submitting Offers for a Resource or Planning Resource (other than a Demand Resource, Behind the Meter Generation Resources less than or equal to ten (10) MW GVTC that are registered as Load Modifying Resources, Energy Efficiency Resource, or External Resource) that violates the economic withholding thresholds described in Sections 6.4, 6.5, 6.6 and 6.7 so that any of the following would occur:

1) Resource output would not be dispatched or scheduled;
2) Resource or Planning Resource Offers would clear at prices significantly above competitive levels; or
3) RSG MWPs would change substantially.

Offers are submitted by MPs for the purpose of selling Energy, Operating Reserve and Short-Term Reserve into the Day-Ahead and Real-Time Energy and Operating Reserve Markets. Resource Offers consist of several components, including the following:

1) Energy Curve (up to ten costs associated with either blocks or segments of a cost curve);
2) No-Load Offer;
3) Start-Up Offer (hot, intermediate and/or cold);
4) Operating Reserve Offers, including:
    a) Spinning Reserve Offer;
    b) Supplemental Reserve Offer; and
    c) Total, Capacity, and Mileage Regulation Offer;
5) Off-Line Short-Term Reserve Offers;
6) Time-based parameters (e.g., Hot/Intermediate/Cold Notification/Startup Times, Minimum/Maximum Run Times and Minimum Down Time); and
7) Other Parameters Not Expressed in Time or Dollars (e.g., Maximum Daily/Weekly Starts and Ramp Rate Curve).

DRR Type I Offers consist of several components, including the following:

1) Energy Cost;
2) Curtailment Offer; and
3) Shut-down Cost.

To screen an MP's conduct for economic withholding, each component of its Offer and Planning Resource Offers is compared to a competitive benchmark, or Reference Level (see Section 6.9). Any Offer component that exceeds its Reference Level by more than a specified threshold is identified for possible mitigation.

Selling Energy, Operating Reserve, Short-Term Reserve or Planning Resource capacity at a higher price in a non-MISO market is not considered economic withholding and is not inconsistent with competitive conduct.

5.1.2 Uneconomic Production

Uneconomic production is:

1) Submitting offers to increase output or increasing the output of a Resource to a level that would otherwise be uneconomic that causes a Binding Transmission Constraint or Binding Reserve Zone Constraint or makes an existing constraint worse.
2) Energy produced where hourly average LMPs are less than the lesser of 50 percent of Reference Levels and Reference Levels minus $25 while causing a binding transmission constraint may warrant the imposition of a Mitigation Measure when it results from any of the following conduct:
    a) Energy is offered for the lesser of 50 percent of Reference Levels and Reference Levels minus $25,
    b) Real-time Economic Minimum Limit of an offer from a Resource exceeds 125% of the applicable Reference Level,
    c) Any of the non-price conduct thresholds in Section 6.4.(3) or (4) are exceeded, or
    d) Real-time output from a Resource exceeds 110% of the Optimal Achievable Output.

5.1.3 Uneconomic Demand Bids

MPs serving Load may choose to purchase or schedule Load in either, or both, the Day-Ahead Energy and Operating Reserve Market or in the Real-Time Energy and Operating Reserve Market. MPs that under-schedule the Load of LSEs in the Day-Ahead Energy and Operating Reserve Market may have the ability to depress prices in the Day-Ahead Energy and Operating Reserve Market relative to prices in the Real-Time Energy and Operating Reserve Market. As a result, LMPs in the Day-Ahead Energy and Operating Reserve Market may not achieve the degree of convergence with LMPs in the Real-Time Energy and Operating Reserve Market that would be expected in a workably competitive market.

Demand Bids represent a financially binding Bid to purchase Energy in the Day-Ahead Energy and Operating Reserve Market for consumption in the next operating day. Either Fixed Demand Bids or Price-Sensitive Demand Bids (which are only submitted in the Day-Ahead Energy and Operating Reserve Market) are considered uneconomic if they:

1) Cannot be justified based on risk management or other economic considerations, and
2) Cause or contribute to a substantial divergence between day-ahead prices and real-time prices.

5.1.4 Uneconomic Virtual Transactions

Uneconomic Virtual Transactions may contribute to an unwarranted divergence between LMPs in the Day-Ahead and Real-Time Energy and Operating Reserve Markets if they are used to create congestion in the Day-Ahead Energy and Operating Reserve Market or otherwise influence prices or Resource commitments in the Day-Ahead Energy and Operating Reserve Market. Virtual Transactions in the Day-Ahead Energy and Operating Reserve Market are considered uneconomic if they:

1) Cannot be justified based on risk management or other economic considerations, and
2) Cause or contribute to a substantial divergence between day-ahead prices and real-time prices. All transactions contributing to a substantial price divergence are considered together.

5.1.5 Other Categories of Conduct

The IMM will monitor Markets and Services for other categories of conduct, whether by a single firm or by multiple firms, that substantially distort competitive outcomes in the Energy and Operating Reserve Markets, the PRA, or any other market administered by MISO. The IMM will:

1) Seek to amend the Categories of Conduct that may warrant mitigation as necessary to include any conduct that would substantially distort or impair the competitiveness of any of the Energy and Operating Reserve Markets or any other markets administered by MISO; and
2) Seek authorization from FERC to mitigate the effects of that conduct.

Any modification to the Categories of Conduct listed in this Section 5.1 that may warrant mitigation, whether recommended by the IMM or derived from another source, must be filed with FERC by MISO.

Resources designated for RAR in a given Season of the PRA, which subsequently are in full or partial outages or derates which reduce their RT Hourly Emergency Max Limit offers below their must offer requirement for more than 31 days during that Season (and have not replaced their ZRCs and so remain designated for RAR) must submit documentation of the unplanned outages/derates to the IMM when requested. IMM review of the documentation seeks to determine if the outage/derate durations were known or could have been reasonably anticipated at the time of the closing of the PRA per section 69A.3.1.h.a of Module E-1. If the outage/derate

durations, in the judgement of the IMM upon reviewing the results of an investigation, were known or could have been reasonably anticipated at the time of the PRA, then the unplanned outages could be counted in combination with planned outages toward the 31-day threshold beyond which capacity replacement is required and Capacity Replacement Non-Compliance Charges (CRNCC) may be applied per the Tariff (Section 69A.3.1.h). Note that the IMM will not include unplanned outages and derates, which may have been expected, but are consistent with historical performance and already accounted for in a resource's SAC accreditation.

If prior to the PRA, a MP does not have a reasonable expectation that outages or derates will be less than 31 days during a Season of the Planning Year, it may request an exclusion of the capacity in question per the Tariff (Section 64.1.1.g.xi) and not include it in a ZRC transaction or FRAP, and not offer it into the PRA.

5.2 Transmission Constrained Areas

Mitigation Measures are only applied in response to the presence of Binding Transmission Constraints (including constraints in neighboring areas such as PJM), local reliability constraints that recognize unique local area characteristics, Operating Reserve requirements, Short-Term Reserve requirements or reliability needs, or market design flaws in rules or business practices that operate differently than expected under market conditions and that impede competitive operation. This limitation shall not apply to the imposition of Default Offers on Planning Resources in the PRA. Some transmission constraints are chronic and isolate narrow market areas with a limited number of suppliers, enabling at least one supplier to have significant market power. Some of these are long-lasting due to intact system topology, while others are unanticipated and transitory, often associated with transmission or generation outages. These two types of constrained areas are NCAs and DNCAs. Other constraints isolate market areas that are broader and contain a larger number of suppliers and are often transitory. These areas are BCAs. Because the conditions for all three of these types of constrained areas and the associated market power concerns are different, all three are treated differently under the MMM Plan. Binding Transmission Constraints may also occur in adjacent areas that affect the dispatch or commitment of Electric Facilities in the MISO Region (e.g., TLR and Market-to-Market). These are treated as BCAs.

Locational market power can be induced in NCAs, DNCAs, or BCAs by suppliers considered to be Pivotal Suppliers (see Section 5.2.2). If the IMM observes market power problems that are not captured using the NCA, DNCA, or BCA screening processes (as well as VLR screening discussed below), the IMM will notify FERC of such problems.

5.2.1 Narrow Constrained Areas

An NCA is defined as an electrical area in the MISO Region where both of the following apply (see Exhibit 5-1A):

1) One or more Binding Transmission Constraints or Binding Reserve Zone Constraints into or in a common electrical area are expected to be binding for more than 500 hours during a given twelve-month period; and
2) At least one supplier is pivotal in the electrical area (see Section 5.2.2).

Exhibit 5-1A: Narrow Constrained Area

IF

At least one Binding Transmission Constraint or Binding Reserve Zone Constraint into or in a common electrical area in MISO is expected to be binding for more than 500 hours in a given 12-month period

AND IF

At least one supplier is pivotal in that electrical area

THEN

The electrical area is designated as a Narrow Constrained Area

In NCAs, transmission constraints frequently bind and isolate the area when they are binding and control of generation that can relieve these constraints is relatively concentrated. As a consequence, market power is likely to be substantial whenever the relevant constraints are binding.

The IMM designates, subject to FERC approval, in advance the NCAs in the MISO Region. At least once a year (more often when necessary), the IMM evaluates congestion patterns in the MISO Region to identify NCAs. Once an area is designated as an NCA, the economic withholding conduct thresholds for Energy Offers, minimum generation Offers and Start-Up Offers for that area become more stringent than for a BCA (see Sections 6.4 and 6.5). The IMM will post on the MISO website the Generators located in the designated NCAs and file this information with FERC. This information may be accessed at:
https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ANCA%20Theshold&t=10&p=0&s=FileName&sd=desc

Without releasing Confidential Information, the IMM will provide any interested MPs with a description of its supporting analysis to allow comment on proposed changes to NCA designations.

Once the initial NCAs are defined, MISO may remove an area's designation as an NCA only if the IMM determines that the transmission constraints that define the NCA have been, or are expected to be, binding for fewer than five hundred 500 hours during a given twelve-month period. The IMM will not deactivate an NCA if the real-time binding hours are suppressed artificially by uneconomic commitments to maintain reliability in the area. MISO must obtain prior approval from FERC to designate any new area as an NCA and for any change or removal of that designation. MISO must provide an opportunity for comment from MPs and then submit to FERC the analysis

supporting any such change. Analyses of the number of hours that transmission constraints were actually binding in recent calendar quarters are posted on the internet at: https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ANCA%20Theshold&t=10&p=0&s=FileName&sd=desc

5.2.2 Pivotal Suppliers

A supplier is considered to be a Pivotal Supplier when the output of some of its Resources must be increased or decreased to resolve a Binding Transmission Constraint during some or all hours when the constraint is binding. The IMM uses transmission Load flow cases reflecting a variety of market conditions to determine whether a supplier is pivotal. These Load flow cases estimate the Generation Shift Factors (GSFs) for all Resources relative to each potentially constrained Flowgate, the base flows on each Flowgate, and the base loadings of each Resource.

5.2.3 Dynamic Narrow Constrained Areas

A DNCA is an electrical area identified by the IMM that is defined by one or more Binding Transmission Constraint(s) not expected, or not yet determined, to be sustained for a period long enough to identify it as a Narrow Constrained Area, where the following conditions apply (see Exhibit 5-1B):

1) Binding Transmission Constraints into area have been binding for at least 15 percent of the hours in a continuous five-day period prior to the current period; or
2) The IMM identifies the initiation of an outage or re-occurring condition that previously has caused the binding of at least 15 percent of hours in a five-day period; and
   the conduct and impact tests applicable to DNCAs have been met by one or more Resources.

Exhibit 5-1B: Dynamic Narrow Constrained Area

IF

A Binding Transmission Constraint has been binding in at least 15 percent of hours in a five-day period or the IMM identifies the initiation of an outage or re-occurring condition that previously has caused such a condition,

AND IF

At least one supplier has met the DNCA conduct and impact thresholds in the electrical area,

THEN

The electrical area is designated and activated as a Dynamic Narrow Constrained Area.

In DNCAs, transmission constraints that are not already limiting electrical areas defined as NCAs may bind severely during unanticipated conditions such as outages. The constraints may be transitory, but control of generation that can relieve these constraints may be relatively concentrated. Consequently, market power may be substantial whenever the relevant constraints are binding.

The IMM designates a DNCA when one or more suppliers has met the conduct and impact tests specified in sections 63.3 and 64.1.2. The energy market price impact threshold for DNCAs is $25/MWh (as compared to $100/MWh for BCAs). Once an area has met the DNCA criteria, the IMM will inform MISO, and MISO will post on the MISO website the Generators located in the designated DNCAs.

DNCAs will remain activated until at least one of the following conditions has been met:

1) The outages or conditions determined to be causing the Binding Transmission Constraint(s) have been resolved;
2) No mitigation has occurred in the activated DNCA in the prior 30 days.

The IMM will notify MISO when such conditions have been met for any active DNCAs.

Information regarding DNCAs may be accessed at:
https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ADNCA&t=10&p=0&s=FileName&sd=descDNCAInformation_Postings.XLS

The information will include:

1) The name of the DNCA;
2) The constraint name(s);
3) The date of activation; and
4) The date of deactivation (when it is determined).

MISO will also make a notification of a newly activated (or deactivated) DNCA via the MISOALLSL@lists.misoenergy.org and EORPSL@lists.misoenergy.org.

5.2.4 Broad Constrained Areas

A BCA is an electrical area where the presence of Binding Transmission Constraints generally does not result in substantial market power. Even when the constraints that isolate a BCA are binding, the market generally remains competitive because of the large number of suppliers with available Resources in the area. However, under high Load conditions when most competing Resources are producing at full output, the market may be vulnerable to substantial price increases. In addition, unusual transmission or supply conditions arising from Electric Facility outages may give rise to opportunities to exercise market power within a BCA.

Consequently, a BCA is defined as an electrical area where sufficient competition usually exists even when one or more transmission constraints or Reserve Zone constraints are binding, or where the transmission constraints bind infrequently. However, within a BCA, a transmission constraint can result in substantial locational market power under certain market or operating conditions.

BCAs are **not identified in advance** by the IMM. In BCAs, market power concern is related to specific Load conditions and outages and, thus, BCAs are defined dynamically when constraints arise on any Flowgates in the MISO Region.

A positive and negative Constraint Generation Shift Factor Cutoff (CGSFC) is specified by the IMM to identify Resources that will be included in a BCA. Default levels of +.03 and –.03 will be used as the positive and negative CGSFCs, with higher cutoffs applied to higher voltage Flowgates as follows:

- For monitored facilities at or above 345kV, -6% and 6%
- For monitored facilities above 138kV and less than 345kV, -4% and 4%

The CGSFC values establish the thresholds that determine which Resources have a relatively large effect on the corresponding Flowgate. A Resource is considered to have a significant effect on the Flowgate if the value of its GSF (which may be either positive or negative) is outside the range of the Flowgate's positive and negative CGSFC values (see Exhibit 5-2).

Exhibit 5-2: Significant Resources in a Broad Constrained Area

IF
Positive GSF > Broad Constrained Area Flowgate Positive CGSFC
OR
Negative GSF < Broad Constrained Area Flowgate Negative CGSFC
THEN
The Resource has a significant effect on the Flowgate and is subject to the economic withholding Conduct Test

When a constraint is binding, Resources that significantly affect the flow over the constrained Flowgate would be included in the BCA associated with that Flowgate. The CGSFCs alone are not used to determine whether a Resource is exercising market power. The CGSFC values do, however, identify for each Flowgate the Resources that are subject to the economic withholding Conduct Test (Section 6.4) and Impact Test (Section 7.1) when congestion occurs on that Flowgate.

GSFs for each Resource relative to all Flowgates in the MISO Region are determined dynamically to reflect the topology of the system using the day-ahead or real-time dispatch models as appropriate. GSFs are not significantly affected by changes in power flows. They may change significantly when network topology changes, however.

The IMM posts all CGSFCs for current and previously active BCAs on the MISO website. CGSFCs are reviewed annually to determine whether any adjustments are necessary. CGSFCs may be accessed at:
https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ANCA%20Theshold&t=10&p=0&s=FileName&sd=desc

The IMM also posts a representative set of GSFs on the IMM website that quantifies the effect of each Resource on each Flowgate. GSFs, updated as needed, may be accessed by authorized personnel at the following site: https://www.potomaceconomics.com/ocs, located under the "View Files" tab.

5.2.5 Reserve Zones

A Reserve Zone is defined as a group of Resource, Load and Interface CPNodes where minimum Operating Reserve and Short-Term Reserve requirements are established through Reserve Zone Configuration studies as described in Section 39.2.1.A.d of the Tariff. A Reserve Zone constraint may activate a BCA and measures would then be applied within the BCA in the normal manner.

6 Conduct Thresholds Established to Trigger Mitigation

The first part of the two-part MMM testing process is to screen the behavior of MPs to identify conduct that may warrant mitigation. For example, Conduct Tests identify components of Offers that exceed their Reference Levels by more than defined threshold amounts. The Conduct Test differentiates between scarcity and market power for purposes of mitigation (i.e., if suppliers are not withholding physically or economically, any price increases are the result of scarcity rather than market power).

This section describes the specific thresholds of conduct that may trigger mitigation and how Reference Levels are determined and applied. **Conduct Thresholds** are categorized as follows:

1) Physical withholding conduct thresholds for a Resource;
2) Physical withholding conduct thresholds for a Planning Resource;
3) Physical withholding conduct for a Transmission Facility;
4) Economic withholding conduct thresholds in BCAs;
5) Economic withholding conduct thresholds in NCAs;
6) Economic withholding conduct threshold in DNCAs;
7) Economic withholding conduct thresholds for a Planning Resource;
8) Economic withholding conduct thresholds in Reserve Zones; and
9) Uneconomic production conduct thresholds.

The IMM also monitors Demand Bids, Virtual Transactions and Demand Response Resources as described in Sections 8.3, 8.4 and 9.

6.1 Physical Withholding Conduct Thresholds for Resources

Physical withholding of a Resource makes it partly or totally unavailable. Primary reasons to consider a Resource physically withheld can be any of the following (see Exhibit 6-1):

1) Taking an unapproved derating or outage;
2) Refusing to provide Offers or schedules for Capacity Resources that are capable of providing service;
3) Unjustifiably declaring a Resource derated, unavailable or forced out-of-service; and
4) Using a time-based Offer parameter or a Offer parameter expressed in units other than time or dollars that causes capacity from a unit to be unjustifiably unavailable to the market (e.g., a zero ramp rate for a unit that is at part-Load or a long startup and notification time).

Penalty Charges for physical withholding in the Day-Ahead and Real-Time Energy and Operating Reserve Markets or in the RAC process are applicable to Capacity Resources that are designated to satisfy resource adequacy requirements as defined under Module E-1 of the Tariff, regarding Resource Adequacy. Non-Capacity Resource units may be subject to Penalty Charge for physical withholding in the Real-Time Energy and Operating Reserve Market only.

If a non-Capacity resource participates in the Real-Time Energy and Operating Reserve Market, it is potentially subject to physical withholding when the resource output is unjustifiably less than the Optimal Achievable Output by the thresholds defined below, and such conduct also causes Impact based upon the Impact Threshold. If this occurs, the MP may be subject to Penalty Charges for physical withholding regardless of Capacity Resource status.

In an NCA, **all** instances of physical withholding of Resources, as defined above, are automatically subject to Impact Testing and possible mitigation. Thus, in an NCA, the conduct threshold for physical withholding may be any of the above behaviors without regard to any minimum quantity of that activity.

In BCAs, however, conduct thresholds for physical withholding of a Resource are less stringent. In addition to any of the above conditions, either of the following conduct thresholds must also be exceeded, in the presence of a Binding Transmission Constraint, to establish physical withholding of a Resource (see Exhibit 6-1). These additional conditions do not apply to an NCA. Nor are they applicable in a BCA in the absence of a Binding Transmission Constraint:

1) Operating a Resource in real-time at an output level that is less than the lesser of 90% of the Optimal Achievable Output and 10 MW below the Optimal Achievable Output.

2) Offering a Resource with an Economic Maximum dispatch or Electric Storage Resource with an Hourly Economic Maximum Discharge Limit that is less than the lesser of 90% of the Optimal Achievable Output and 10 MW below the Optimal Achievable Output.

The physical withholding Conduct Test is also considered to be failed in some instances when a time-based Offer parameter or an Offer parameter expressed in units other than time or dollars is changed without valid reason when it is too late for the IMM to prospectively substitute a Default Offer.

Exhibit 6-1: Test for Physical Withholding Conduct for a Resource

EITHER OF THE FOLLOWING

Taking an unapproved deration or outage[1]
Refusing to provide Offers or schedules in either the Day-Ahead or the Real-Time Energy and Operating Reserve Markets (Real-Time Energy and Operating Reserve Market only for a non-Capacity Resource)[1]
Unjustifiably declaring a Resource derated, unavailable or out-of-service[1]

OR, IN SOME INSTANCES

Using a time-based Offer parameter or a Offer parameter expressed in units other than time or dollars that causes Capacity from a unit to be unjustifiably unavailable to the market (e.g., zero ramp rates for a Resource that is at part-Load or offering long startup and notification times). [1]

AND, FOR A BROAD CONSTRAINED AREA ONLY, EITHER OF THE FOLLOWING

Offering an Economic Maximum Dispatch less than the lesser of 90% and at least 10 MW below the Optimal Achievable Output[2, 3]
Operating at < 90% and at least 10 MW below the Optimal Achievable Output in real-time[2, 3]

AND

Causing a Binding Transmission Constraint (negative GSF < negative CGSFC for a constraint that is binding) [1]

RESULTS IN

Failure of **Resource Physical Withholding Conduct Test**
1 Applies to both Broad and Narrow Constrained Areas 2 Applies to Broad Constrained Areas only

3 Hourly for Day-Ahead Energy and Operating Reserve Market and RAC and average over 5-minute intervals for Real-Time Energy and Operating Reserve Market

6.2 Physical Withholding Conduct Thresholds for Planning Resources

Physical withholding of a Planning Resource makes it partly or totally unavailable to the PRA. The primary reasons to consider a Planning Resource physically withheld are any of the following:

1) Refusing to follow procedures to qualify Planning Resources to receive eligible Seasonal Accredited Capacity (SAC) MWs (SAC MWs that can be converted to ZRCs), and procedures for converting such SAC MWs to ZRCs;
2) Refusing to submit Zonal Resource Credit Offers from Planning Resources that meet deliverability requirements into the PRA that are not designated to satisfy the capacity obligations of an LSE in MISO or exported;
3) Exporting Planning Resources to a capacity market with prevailing prices less than 50 percent of the expected PRA clearing price; and
4) Overstatement of capacity obligations.

If the MP unjustifiably does not participate in the PRA by an amount exceeding the conduct threshold, and causes Impact based upon the Impact Threshold, the MP may be subject to Penalty Charges for physical withholding.

The following threshold will be employed by the IMM to identify physical withholding from the PRA by a supplier that owns or controls Planning Resources and that supplier's Affiliates.

1) The Physical Withholding conduct threshold shall initially be set at 50 MW for each LRZ applied collectively to a Market Participant and any Affiliate.
    a) The IMM will use reasonable efforts to contact each Affiliate one time during the Planning Resource Auction offer window when the Market Participant has a non-zero ZRC balance that does not exceed the Physical Withholding Threshold Quantity, but the combined affiliated Market Participant offers do exceed the Physical Withholding Threshold Quantity. This is done to allow Market Participants to change their ZRC Offers prior to the offer window closing. During the Auction offer window, the IMM will post messages identifying whether an Affiliate is failing conduct on the Exclusions Request page of the IMM website https://potomaceconomics.com/ocs. MPs should check the messages for each season on this page after completing their offers into the Auction and before the close of the offer window.

b) MISO will develop and provide the IMM with a list of Affiliate relationships. The IMM may modify this list of Affiliate relationships. Market Participants may contact MISO to review their Affiliate relationships. It is also posted on the IMM website at the above link.

2) The IMM may modify the Physical Withholding conduct threshold, if it determines that the current threshold is not effective in mitigating suppliers' ability to affect prices in the PRA, or that the current threshold is unreasonably restrictive. Modifications will be done in accordance with Module D of the Tariff.

Physical withholding is calculated as:

1) The sum of the following;
   a) Capacity that unjustifiably did not get processed through the qualification procedures to become SAC and meets deliverability requirements
   b) Unconverted SAC that meets deliverability requirements
   c) ZRC balance (Converted SAC – FRAP – Bilateral Sales + Bilateral Purchases)
   d) Over-forecast of ZRC obligation
2) Less the sum of the following:
   a) SAC documented with the IMM as sold outside MISO at a price greater than or equal to 50 percent of a reasonably expected PRA clearing price (i.e., the lowest ACP across the past 3-year period).
   b) ZRCs offered into the PRA that have not cleared.
   c) SAC documented with the IMM as being uneconomic to sell due to the facility-specific Reference Level exceeding the CONE.
   d) SAC documented with the IMM as exported outside of MISO to serve their own capacity requirements associated with their load in that area.
   e) SAC documented with the IMM expected to be in Suspend status during the relevant Season of the Planning Year that is not offered as part of the Planning Resource Auction because operation of that Capacity during the relevant Season of the Planning Year would be contrary to applicable law, regulation, or court or agency order (such as a state regulatory order pertaining to non-operation of a generator, settlement with an environmental agency, or a consent decree approved by a court).
   f) SAC documented with the IMM as capacity in Suspend status that cannot, regardless of cost, be returned to operation within thirty (30) Calendar Days after the start of the relevant Season of the Planning Year.
   g) SAC documented with the IMM as expected to be on outage and/or derate for greater than thirty-one (31) Days in a Season of the Planning Year. SAC

excluded for this reason can still be offered in the relevant Season in the PRA up to the annual CONE value divided by the number of days in the Season without needing to request a facility-specific Reference Level and will not be evaluated for economic withholding in that Season if at or under that value. In making the determination whether this SAC exclusion applies to a resource, the IMM considers whether the CRNCC and accreditation risk exposure can be reasonably accounted for in Default Offers (see Section 8.1) and the practicality of resource substitution, where applicable. The IMM will investigate material discrepancies between planned and actual outage duration for any resources not participating or offering above the economic conduct threshold in a Season (as specified in 64.2.1.e of the Tariff). Resources not found to be acting in good faith may be referred to FERC enforcement.

Market Participants that intend to withhold SAC in the PRA in excess of the Physical Withholding conduct threshold for any of the reasons listed above (as detailed in Section 64.1.1.g of the Tariff) should request approval from the IMM and provide supporting documentation through the Exclusion Request page of the IMM website https://potomaceconomics.com/ocs. This includes deliverable resources with no SAC listed in the MISO MECT (e.g., a resource on long-term suspension that is still holding its interconnection rights). Prior to the auction, MISO will provide the IMM with a list of resources that are currently deliverable or expected to be deliverable during one or more Seasons of the Planning Year. For new resources that will on-ramp during one of Seasons of the Planning Year, MISO will provide the expected Commercial Operation Date (COD) to the IMM. If an MP with such a resource expects at the time of the auction that the COD could be pushed back or moved forward, they should reach out to IMM about potential exclusions from physical withholding.

Demand Resources, Behind the Meter Generation Resources less than or equal to ten (10) MW GVTC that are registered as Load Modifying Resources, Energy Efficiency Resources, and External Resources are not considered for physical or economic withholding mitigation in the RPA.

6.3 Physical Withholding Conduct for Transmission Facilities

A transmission facility is considered physically withheld if it is unjustifiably derated or out of service, inefficiently reduces the capability of the Transmission System, or unjustifiably rated below its full capabilities, thereby causing a Binding Transmission Constraint (see Exhibit 6-2). These conditions apply to either Narrow or Broad Constrained Areas.

Exhibit 6-2: Test for Physical Withholding Conduct for a Transmission Facility

ANY OF THE FOLLOWING
Taking an unapproved deration or outage
Falsely declaring transmission facility derated, forced out-of-service or unavailable
Inefficiently reducing the capability of the Transmission System
Unjustifiably rating facilities below their full capabilities
Scheduling maintenance not approved by MISO
AND
Causing a Binding Transmission Constraint
RESULTS IN
Failure of **Transmission Facility Physical Withholding Conduct Test**[1]
[1]Applies to both Broad and Narrow Constrained Areas

A transmission facility is not considered physically withheld if a forced outage occurs or it is out of service for maintenance in compliance with a maintenance schedule approved by MISO. However, scheduled maintenance that is not approved by MISO may be considered physical withholding, such as a Transmission Operator's unauthorized maintenance schedule that is not justified on legitimate economic, safety or reliability grounds, and which causes a Binding Transmission Constraint.

6.4 Economic Withholding Conduct Thresholds for Energy in Broad Constrained Areas

In a BCA where sufficient competition usually exists or where the transmission constraints bind infrequently, the conduct thresholds described below identify economic withholding that may warrant the mitigation of a Resource (see Exhibit 6-3). These BCA conduct thresholds are determined with respect to the Reference Levels for each Resource. Section 6.9 describes the five methods that are available for determining Reference Levels for the components of Offers from Resources.

Since transmission constraints in BCAs do not normally bind frequently, the thresholds listed below are intended to ensure that mitigation is only applied to significant instances of locational market power when one or more Transmission Constraints are binding. Unless specified

otherwise, the difference between the offered and reference values must exceed the indicated threshold for a conduct failure to occur. Only Resources whose GSFs are outside the range of the positive and negative CGSFCs for a Flowgate with Binding Transmission Constraints are subject to these Conduct Tests:

1) ***Energy and Minimum Generation Offers*** – A 300% increase or a $100 per MWh increase above the Reference Level, whichever is lower. Energy Offers or minimum Generation Offers below $25 per MWh are not considered economic withholding.

   For example, the conduct threshold for an Energy Offer or Minimum Generation Offer with a Reference Level of $32/MWh is the lower of:

   3.00*$32=$96/MWh for the 300% threshold, or

   $100/MWh for the $100 threshold

   This example results in a conduct threshold value of $96/MWh, so an offer over $128/MWh fails the conduct test.

   On the other hand, if the Reference Level were $35/MWh, the conduct threshold would be the lower of:

   3.00*$35=$105/MWh, or

   $100/MWh

   This results in a conduct threshold of $100/MWh, so an offer over $135/MWh fails the conduct test.

   Note that the Minimum Generation Offer (in $/hr) is calculated as follows:

   Min Gen Offer = (No-Load Offer) + (Area under the Energy Offer Curve from 0 MW to Dispatch Minimum MW)

   Where:

   Energy Offer curves are described in the BPM for Energy and Operating Reserve Markets, and

Dispatch Minimum is a Generation Offer parameter, the minimum MW level at which a Resource may operate under normal system conditions, also referred to as the "Hourly Economic Minimum Level"

The Minimum Generation Offer Reference Level is determined in a similar fashion as follows:

Min Gen Reference = (No-Load Reference) + (Area under the Incremental Energy Reference Curve from 0 MW to As-Offered Dispatch Minimum MW)

2) ***Start-Up Offers*** – A 200% increase above the Reference Level is the conduct threshold. Offers of $200 or less do not fail the conduct threshold regardless of the Reference Level. This applies to the cold start-up Offer, intermediate start-up Offer or hot start-up Offer, whichever is applicable to the specific start-up time of the Resource.

3) ***Time-Based Offer Parameters*** – An increase of 3 hours above the Reference Level, or an increase of 6 hours in total for multiple time-based Offer parameters above their Reference Levels. There are several time-based Offer parameters, including multiple Notification and Start-Up Times, Minimum and Maximum Run Times and Minimum Down Time. Each of these parameters has a Reference Level.
4) ***Offer Parameters Expressed in Units Other than Time or Dollars*** – A 100% increase above the Reference Level for parameters that are minimum values (including Ramp Rate) or a 50% decrease from the Reference Level for parameters that are maximum values (including the Maximum Number of Daily/Weekly Starts). Commitment and dispatch statuses other than "economic" fail this conduct test if they have the effect of limiting minimum or maximum output in an uneconomic fashion.

Additionally, economic withholding of a Resource committed in a BCA may warrant mitigation of the Day-Ahead or Real-Time RSG MWP for the duration of the commitment period if it satisfies the following conditions:

a. The Offer results in an increase that exceeds the greater of $25/MWh or 25% in Total Production Cost and Operating Reserve Cost due to an increase in the Offer above the applicable Reference Levels for a Resource; or

b. The Resource fails any of the conduct thresholds described in Sections 6.4.3, 6.4.4, or 6.8.1.b of this document.

Exhibit 6-3: Test for Economic Withholding Conduct in a Broad Constrained Area

ANY OF THE FOLLOWING

Energy or Minimum Generation Offers: 300% or $100/MWh increase over RL,[1] whichever is lower
Start-Up Offer: 200% increase over RL if the Offer is at least $200
Time-based parameters: 3 hour increase over RL or 6 hour total increase for multiple parameters
Other parameters: 100% increase over RL for minimum values or 50% decrease below RL for maximum values

AND

Causing a Binding Transmission Constraint in the Broad Constrained Area

RESULTS IN

Failure of **Economic Withholding in Broad Constrained Area Conduct Test**
[1]RL = Reference Level

For resources committed to resolve Voltage or Local Reliability (VLR) constraints, the conduct test is failed for Offers which result in a ten percent (10%) increase in total Production, Operating Reserve and Short-Term Reserve costs due to an increase in the MP's submitted Offer from the applicable Reference Level Offer for the Resource; or the Resource conduct exceeds any of the thresholds described in Sections 6.5.3, 6.5.4, or 6.8.1.b of this document.

6.5 Economic Withholding Conduct Thresholds for Energy in Narrow Constrained Areas

In designated NCAs where transmission constraints are expected to be binding for more than 500 hours per year and one or more suppliers are pivotal, conduct thresholds for Energy and Minimum Generation Offers are more restrictive. Conduct thresholds are lower for NCAs than for BCAs because NCAs are constrained more frequently and are more likely to have the conditions conducive to market power.

Once an area is designated as an NCA, the issue of whether any specific supplier is pivotal when conduct is being tested is no longer pertinent. Pivotal suppliers contribute to the initial determination of an NCA but any Resource, regardless of whether it is pivotal, may be subject to mitigation for conduct in an NCA. Each NCA is analyzed separately to determine the presence of

a Binding Transmission Constraint for that particular area and the interfaces associated with each NCA are published on the MISO website.

The thresholds described below are used to identify economic withholding that may warrant the mitigation of a Resource in a NCA when a constraint is binding (see Exhibit 6-4). These thresholds are determined with respect to the Reference Levels described in Section 6.9 and are effective when one or more Interfaces into the NCA being tested have a Binding Transmission Constraint:

1) ***Energy and Minimum Generation Offers*** – An increase in the Energy Offer or Minimum Generation Offer (i.e., No-Load Offer plus area under the Energy Offer curve up to the Hourly Economic Minimum Level) above the applicable Reference Level by more than the conduct threshold as determined with the following formula:

   NCA conduct threshold= [Net Annual Fixed Cost] / [Constrained Hours] (in units of $/MWh)

   Where:

   Net Annual Fixed Cost = Annual fixed costs of a new peaking Generator ($/MW), including recovery of annualized ($/MW) capital costs minus appropriate credits for the annual net revenue ($/MW) the new peaking Generator would receive from the Markets and Services provided under the Tariff (market revenue less variable production costs) and minus credits for any revenue ($/MW) from resource adequacy payments, and

   Constrained Hours = The total number of hours over the prior 12 months during which a Binding Transmission Constraint has occurred on any Interface into the NCA in which the Resource is located, but not more than 2000 hours.

   Note that an NCA conduct threshold declines (becomes more restrictive) when the number of constrained hours increases for that area since market power is likely to be more severe in areas that experience more frequent constraints.

   NCA conduct thresholds in MISO may be accessed at:
   https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ANCA%20Theshold&t=10&p=0&s=FileName&sd=desc

2) ***Start-Up Offers*** – A 50% increase above the Reference Level for Offers that are at least $50. This applies to the cold Start-Up Offer, intermediate Start-Up Offer or hot Start-Up Offer, whichever is applicable to the specific start-up time of the Resource.
3) ***Time-Based Offer Parameters*** – An increase of 3 hours above the Reference Level, or an increase of 6 hours in total for multiple time-based Offer parameters above their Reference Levels.
4) ***Offer Parameters Expressed in Units other than Time or Dollars*** – A 100% increase above the Reference Level for parameters that are minimum values or a 50% decrease from the Reference Level for parameters that are maximum values.

Additionally, economic withholding of a Resource committed in an NCA may warrant mitigation of the Day-Ahead or Real-Time RSG MWP for the duration of the commitment period if it satisfies the following conditions:

a. The Offer results in an increase that exceeds the greater of $25/MWh or 25% in Total Production Cost and Operating Reserve Cost due to an increase in the Offer above the applicable Reference Level for a Resource; or
b. The Resource fails any of the conduct thresholds described in Sections 6.5.3, 6.5.4, or 6.8.1.b of this document.

Exhibit 6-4: Test for Economic Withholding Conduct in a Narrow Constrained Area

ANY OF THE FOLLOWING

Energy or Minimum Generation Offers: Increase above RL[1] by more than the Narrow Constrained Area conduct threshold = [Net Annual Fixed Cost] / [Constrained Hours]
Start-Up Offers: 50% increase over RL if the Offer is at least $50
Time-Based Parameters: 3 hour increase over RL or 6 hour total increase for multiple parameters
Other Parameters: 100% increase over RL for minimum values or 50% decrease below RL for maximum values

AND

Causing a Binding Transmission Constraint in the Narrow Constrained Area

RESULTS IN

Failure of **Economic Withholding in Narrow Constrained Area Conduct Test**
[1]RL = Reference Level

6.6 Economic Withholding Conduct Thresholds for the Planning Resource Auction

The conduct threshold for Planning Reserve Offers is equal to 10 percent times the Cost of a New Entry (CONE) value divided by the number of days in the Planning Year. The conduct threshold is applied relative to the Initial Reference Level of 0$/MW-Day. However, if a facility-specific Reference Level is in place as described in Section 6.9, a threshold of $0/MW-day applies. Zonal Resource Credit Offers exceeding the applicable Reference Level by the applicable conduct threshold fail the Economic Withholding Conduct Test.

6.7 Economic Withholding Conduct Thresholds for Operating Reserve in Reserve Zones

The conduct thresholds for Contingency Reserve and Regulating Capacity Offers are a 300% increase or a $50 per MWh increase above the Reference Level, whichever is lower. Contingency Reserve and Regulating Capacity Offers below $10 per MWh are not considered economic withholding.

The conduct thresholds for Off-Line Short-Term Reserve Offers are a 300% increase or a $25 per MWh increase above the Reference Level, whichever is lower. Off-Line Short-Term Reserve Offers below $10 per MWh are not considered economic withholding.

6.8 Uneconomic Production Conduct Thresholds

The following thresholds are used to identify uneconomic production that may warrant the imposition of a Mitigation Measure (see Exhibit 6-5):

Energy produced where hourly average LMPs are less than the lesser of 50 percent of Reference Levels and Reference Levels minus $25 while causing a binding transmission constraint may warrant the imposition of a Mitigation Measure when it results from any of the following conduct:

a. Energy is offered for the lesser of 50 percent of Reference Levels and Reference Levels minus $25,
b. Real-time Economic Minimum Limit of an offer from a Generation Resource or Hourly Economic Minimum Discharge Limit for an Electric Storage Resource exceeds 125% of the applicable Reference Level,
c. Any of the non-price conduct thresholds in Section 6.4(3) or (4) are exceeded, or
d. Real-time output from a Resource exceeds 110% of the Optimal Achievable Output.

Uneconomic production is monitored with a focus on instances where generation is operated while LMPs are significantly below Reference Levels. Significant instances are tested for impact and subjected to prospective mitigation or sanctions.

Exhibit 6-5: Test for Uneconomic Production Conduct

BOTH OF THE FOLLOWING

Energy produced where hourly average LMP < lesser of 50% of RL and RL minus $25[1]
AND Causing a Binding Transmission Constraint to Bind

AND

Offering Incremental Energy at Less than the lesser of 50% of RL and RL minus $25 OR
Blocking up EcoMin or Hourly Economic Minimum Discharge Limit more than 25% above RL OR
Any of the non-price conduct thresholds in Section 6.4(3) or (4) are exceeded, OR
Real-time output from a Resource exceeds 110% of the Optimal Achievable Output.

RESULTS IN

Failure of **Uneconomic Production Conduct Test**[2]
[1]RL = Reference Level [2]Applies to both Broad and Narrow Constrained Areas

6.9 Reference Levels

Reference Levels serve as benchmarks used in performing Conduct Tests. A Reference Level is established for each component of the Offers for all Resources participating in the Energy and Operating Reserve Markets. While only Electric Storage Resources and Generation Resources, including Stored Energy Resources Type II and Demand Response Resources Type II resources, are subject to market power mitigation, all resources are subject to offer cap restrictions required by FERC Order 831. These offer cap rules are enforced using reference levels for participating demand-side resources. A Reference Level is established for Electric Storage Resources, Generation Resources and Behind-the-Meter Generation Resources in the PRA (Planning Resource Auction). Demand Resources, Behind the Meter Generation Resources less than or equal to ten (10) MW GVTC that are registered as Load Modifying Resources, Energy Efficiency Resources, and External Resources are excluded from having a Reference Level in the PRA.

Reference Levels for Energy are calculated and posted to the market portal for as many as 10 segments and up to the maximum capability for most Resources. In addition, Reference Levels are calculated for all other applicable Offer components, including Start-Up costs, No-Load costs, Operating Reserve costs, Off-Line Short-Term Reserve costs and the physical parameters of the

unit, such as Ramp Rates, Dispatch Limits, Minimum Down Time, commitment status and dispatch status. The No-Load Reference Levels are used in conjunction with the Energy Reference Levels at Dispatch Minimum to calculate Minimum Generation Reference Levels for each Resource as described in more detail above in Section 6.4 1.

For DRR Type I resources, Reference Levels for Energy are calculated for 1 segment. Reference Levels are also calculated for other applicable offer components, including Shutdown Costs, Curtailment Offer. Similarly, Electric Storage Resources have Reference Levels calculated for Hourly Discharge Ramp Rate, Hourly Economic Minimum Discharge Limit and Hourly Economic Maximum Discharge Limit.

Reference Levels are used in conjunction with various conduct thresholds to detect economic withholding and uneconomic production. Reference Levels reflect a Resource's marginal costs, including justifiable risk and opportunity costs or, for physical Offer parameters, they reflect justifiable technical characteristics.

Reference Levels for aggregated and Jointly Owned Resources are determined to correspond to the way MPs enter Offers in the Energy and Operating Reserve Markets.

6.9.1 Methods to Calculate Reference Levels

Five methods are available to calculate Reference Levels. A Reference Level for each component of a Resource's Offer is typically calculated using the first of the two methods described below for which sufficient information is available, following the order of precedence in which they are listed (see Exhibit 6-6):

1) ***Offer-Based*** – The lower of the mean or the median of a Resource's accepted Energy Offers or Ancillary Services Offers in competitive periods (i.e., when transmission constraints are not binding) over the previous 90 days separately for Peak and Off-Peak periods and, for the Real-Time and Day-Ahead Energy and Operating Reserve Markets, adjusted for changes in spot fuel prices (see Attachment A, Reference Level Calculations). Offer-based Reference Levels are particularly applicable for Resources that are dispatchable (i.e., whose output level is determined by the LMP market), where competitive conditions prevail in most hours, providing a strong incentive for suppliers to offer competitively (at or close to their marginal costs).

2) ***Cost-Based (Consultative)*** – A level determined in consultation with the MP submitting the Offer and intended to reflect a Resource's marginal costs, including prudent risk premiums and opportunity costs, or justifiable technical characteristics for

physical Offer parameters, provided that this consultation is done prior to the occurrence of the conduct being examined. Consultative Reference Levels are particularly applicable in the following situations:

a) For Resource output segments that have not been dispatched frequently enough in the prior 90-day period to calculate either a valid Offer-based or LMP/MCP-based Reference Level (including new units and Emergency level dispatch ranges);
b) When changes in unit parameters have occurred (e.g., a modified unit configuration or fuel switching);
c) During transition periods between summer cooling and winter heating seasons; and
d) Where a supplier can demonstrate that the Offer-based or LMP/MCP-based Reference Level that the IMM has computed for an output segment significantly understates or overstates the unit's marginal cost.

Either the IMM or the MP may initiate these discussions at any time. Cost-based or consultative references are initiated through the Consultations page of the IMM's OCS website https://potomaceconomics.com/ocs. For OCS access requests or other general inquiries, On MP can contact the IMM at ocssupport@potomaceconomics.com.

The Reference Levels for commitment status and dispatch status are "Economic" unless a consultation with the IMM is conducted that establishes a different status.

Conditions and capabilities of a Resource fluctuate due to a range of causes such as component malfunctions, environmental restrictions, fuel quality issues and testing requirements. When conditions exist that are not reported as outages or derates in CROW, MISO's Outage Coordination System, and that can cause a MP to exceed conduct thresholds, a consultation with the IMM is advised. Sometimes a temporary change to a Reference Level is justified. In the case of generation testing, a Reference Level change will likely not be viewed as justified because generation testing is discretionary and in certain cases could be used to exercise market power when it causes congestion or excessive RSG MWPs. Alerting the IMM about generation testing periods and the associated requirement ahead of time is advisable, especially if the MP does not have the flexibility to schedule the tests during times that minimize impacts to the markets.

IMM staff has presented several workshops on the OCS and the methodology for calculating the cost-based references for energy and ancillary service references. Requests for presentation materials, and additional questions, can be directed to IMM staff.

If sufficient data do not exist to calculate a Reference Level on the basis of the first method and an attempt to determine a Reference Level in consultation with an MP has not been successful, the Reference Level is determined on the basis of one of the following three methods:

3) ***Estimated*** – The IMM's estimate of the variable production costs of the Resource (or the technical characteristics of the Resource for physical Offer parameters), taking into account available operating cost data, appropriate input from the MP, and the best information available to the IMM.
4) ***LMP-Based*** – The mean of the LMP or applicable MCP at the Resource's location during the lowest-priced 25% of the hours that the Resource was dispatched over the previous 90 days for Peak or Off-Peak periods, adjusted for changes in fuel prices. LMP or MCP-Based Reference Levels are particularly applicable for Resources that are self-scheduled or that act as price-takers in the Real-Time Energy and Operating Reserve Market (see Attachment A, Reference Level Calculations).
5) ***Averaged*** – An appropriate average of competitive Offers of one or more similar Resources.

Arrangements can be made with the IMM to override the precedence for selecting methods to calculate Reference Levels if conditions warrant on a unit-by-unit basis in the interest of having Reference Levels reflect incremental costs.

Exhibit 6-6: Order of Precedence for Selecting Reference Levels

1	Lower of the mean or median of accepted Offer components over the past 90 days (for Peak or Off-Peak periods), adjusted for fuel prices
2	Level determined jointly between MP and IMM that reflects the Resource's marginal costs
3	IMM's estimate of the Resource's costs
4	Mean of LMPs/MCPs at the Resource's location during the lowest priced 25% of hours that the unit was dispatched over the past 90 days (for Peak or Off-Peak periods), adjusted for fuel prices
5	Average of competitive Offers for similar Resources

6.9.2 Fuel Price Adjustments and Other Reference Level Considerations

Reference Levels for a Resource's Energy Offer may vary over the Resource's output range. Reference Levels may be shifted to recognize ambient temperature conditions or seasonal factors based on input provided to the IMM by the MP.

The IMM provides MPs with the Reference Levels applicable to their Energy, Operating Reserve and Off-Line Short-Term Reserve Offers via the MISO Market Portal.

Reference Levels are adjusted for daily changes in fuel prices for each of the previous individual 90 days utilized in the Reference Level calculations. MPs may select the appropriate fuel index to use for fuel price adjustments from over 500 indices. Fuel price adjustments to Reference Levels are calculated overnight and typically posted by 10PM each evening. These adjustments to Reference Levels are effective as follows:

1) At midnight, for the start of the next real-time market day;
2) For the day-ahead market running the next day for the t+2 market day.

The selected index will not always perfectly match the delivered fuel price. The Reference Level calculations provide a "basis" off the index to reflect predictable differences. Unpredictable differences are generally accommodated in the conduct threshold. MPs may contact the IMM to make other arrangements including intra-day changes if the Reference Levels do not accurately reflect their costs. For examples of the fuel adjustment calculations, please reference Attachment A as follows:

1) Page A-1 – Example of Offer-Based Reference Calculation Methodology with Fuel Adjustment; and
2) Page A-2 – Example of LMP/MCP-Based Reference Calculation Methodology with Fuel Adjustment.

On its own behalf or upon request by an MP, the IMM will consult with the MP about its Reference Levels. If cost data or other information submitted by an MP indicates that one or more Reference Levels should be changed, revised Reference Levels will be determined, sent to the MP, and implemented as soon as practicable. In any case, the IMM will provide a written explanation of its determination to the MP upon request.

6.9.3 Calculation of Operating Reserve Market Reference Levels for the First 90 Days of the Operating Reserve Market

Section 6.9.1 states that Offer or MCP data from the previous 90 days can be used to determine Reference Levels. With the initial implementation of the Operating Reserve Market, historical data will not be available. This section describes how Reference Levels were developed for the first 90 days of the Operating Reserve Market.

Potomac Economics maintains a website for data collection used in the development of Energy Reference Levels. This same website is used to collect data for the development of Operating Reserve Market and Short-Term Reserve Reference Levels. The URL of the website is https://potomaceconomics.com/ocs.

For the Operating Reserve Market cost survey, the following physical capability parameters for Generation Resources were submitted:

1) Regulation Maximum Limit (MW) (Dispatch Band Regulation Maximum Limits are not submitted);
2) Regulation Minimum Limit (MW) (Dispatch Band Regulation Minimum Limits are not submitted);
3) The Single Directional Down Ramp Rate (MW/min);
4) The Single Directional Up Ramp Rate (MW/min);
5) The Bi-Directional Ramp Rate (MW/min);
6) The Single Directional Down Ramp Rate Curve (MW/min);
7) The Single Directional Up Ramp Rate Curve (MW/min);
8) The Bi-Directional Ramp Rate Curve (MW/min);
9) Off-Line Supplemental Reserve Dispatch Status.

For the Short-Term Reserve Market, the cost survey will collect the cost for standing ready to be synchronized within 30 minutes.
Since the Operating Reserve Market utilizes simultaneous co-optimization, there is no opportunity cost between products that must be included in Offers.[7] Cost components that were considered include:

1) Additional $/hour for equipment wear;
2) Additional MMBtu/hour for efficiency impacts.

Reliability parameters that were considered include:

1) Impact of Regulation on forced outage rate;
2) Probability of not fully responding to a Contingency Reserve Deployment;
3) Probability of failure to follow Setpoint Instructions within tolerance bands while on regulation.

[7] In cases where the Regulation Maximum is below the Dispatch Maximum the operating costs above Regulation Maximum are not co-optimized. The opportunity costs between products for this range can be included in offers. This is accounted for in the reference level calculations.

6.9.4 Calculation of Planning Resource Reference Levels

The Initial Reference Level for Zonal Resource Credit Offers is $0/MW-day.

Facility-Specific Reference Level may be established if a Market Participant provides documentation of Going Forward Costs (GFC) of keeping a Resource or BTMG in operation. "Going-Forward Costs" shall mean: either (a) the Seasonal costs, as shown in eight categories below, that must be met in order to supply Planning Resources, that could be avoided if a supplier otherwise capable of supplying Planning Resources were either (1) to cease supplying Planning Resources and Energy for a specified period while retaining the ability to re-enter such markets (e.g., a resource with seasonal operations or a resource in a longer term suspension that needs necessary repairs before operating again), or (2) to retire permanently from supplying Planning Resources and Energy; or (b) the net opportunity costs of foregone sales outside of MISO, net of costs that would have been incurred as a result of the foregone sale if it had taken place.

A Planning Resource supplier's GFC shall be determined upon the request of the Market Participant responsible for an Electric Facility to the IMM, provided such request is made not later than 45 days prior to the deadline for Offers to sell Planning Resources in the PRA. MPs should submit such requests on or before the deadline through the FSRL Request page of the IMM website https://potomaceconomics.com/ocs.

MPs have the option to use Default Technology Specific Avoidable Costs (DTSAC) which are determined by the IMM and posted on the Transmission Provider's website by no later than 59 Calendar Days prior to the deadline for offers to sell Planning Resources in the Planning Resource Auction. The DTSAC are not Reference Levels, but rather an input to the Reference Level calculation. The DTSAC values, which are posted on an ICAP basis, must be converted to a facility-specific SAC basis and then be reduced by facility specific net revenues to determine the applicable Reference Levels. These converted TSAC FSRL values are posted on the FSRL Request page of the IMM website https://potomaceconomics.com/ocs by no later than 59 Calendar Days prior to the deadline for offers to sell Planning Resources in the Planning Resource Auction. The converted values are subject to change up until the beginning of the Auction.

When the MP requests that GFC be determined, they must clearly indicate if GFC are to be based on either retirement, ceasing operations for a specified period (suspension), or foregone sales. If the MP indicates retirement or suspension, they must also indicate if they are exercising the option of using the DTSAC in place of the non-capital portion of the avoidable costs. If the MP chooses to use DTSAC, it is not necessary for the MP to provide the non-capital avoidable cost data to the IMM. The MP still has the option to provide the capital portion of the avoidable costs when using

DTSAC. If the MP indicates retirement, they must submit an affidavit signed by an authorized officer of the Market Participant attesting that, if the resource does not clear the applicable Season of the Planning Resource Auction, the Market Participant will submit an Attachment Y Notification that it will retire the resource effective prior to the beginning of the following Planning Year (i.e., no later than May 31 of the year after the Planning Resource Auction results are posted).

The supporting documentation to be provided is to be consistent with the specifications posted by the IMM. The general objective in calculating GFC is to include the costs that can be avoided by retiring or suspending at the beginning of the applicable Season of the Planning Year but exclude the cost that can be avoided by retiring or suspending at the end of the applicable Season of the Planning Year. This is accomplished by constructing the two cases described in the Tariff and finding the difference. A third case comprised of two years of historic data is also required for the purpose of validating the data in the two forward cases.

While the Tariff details the categories of costs that can be included in the cases, it is not necessary that the submittal be specifically organized into the itemized cost categories. However, the IMM needs sufficient details to validate the MP submittal against the category requirements. The cost categories are as follows:

1. Operations and Maintenance Labor (OML): the labor expenses related directly to operations and maintenance of the Planning Resource. The categories of expenses included in OML are those incurred for: (a) onsite based labor engaged in operations and maintenance activities; (b) off-site based labor engaged in on-site operations and maintenance activities directly related to the generating unit; and (c) off-site based labor engaged in off-site operations and maintenance activities directly related to generating unit equipment removed from the generating unit site.
2. Administrative Expenses (AE): the administrative expenses related directly to the Planning Resource. The categories of expenses in AE include but are not limited to those incurred for: (a) employee expenses (except employee expenses included in OML); (b) environmental fees; (c) safety and operator training; (d) office supplies; (e) communications; and (f) annual plant test, inspection and analysis.
3. Fuel Availability Expenses (FAE): the operating expenses related directly to fuel availability and delivery for the Planning Resource that are not normally included for recovery in energy and ancillary services market offers. The categories of expenses in FAE include but are not limited to those incurred for: (a) fuel transportation; (b) natural gas storage costs; (c) costs of gas balancing agreements; and (d) costs of gas park and loan services.

4. Maintenance Expenses (ME): the maintenance expenses (other than expenses included in OML) related directly to the Planning Resource. The categories of expenses in ME include, but are not limited to, those incurred for: (a) chemical and materials consumed during maintenance of the generating unit; and (b) rented maintenance equipment used to maintain the generating unit.
5. Operating Expenses (OE): the operating expenses related directly to the Planning Resource. The categories of expenses in OE include, but are not limited to, those incurred for: (a) water treatment chemicals and lubricants; (b) water, gas, and electric service (not for power generation); and (c) wastewater treatment.
6. Taxes, Fees and Insurance (TFI): the tax, fees, and insurance expenses related directly to the Planning Resource. The categories of expenses in TFI include but are not limited to those incurred for: (a) insurance, (b) permits and licensing fees, (c) site security and utilities for maintaining security at the site; and (d) property taxes.
7. Corporate Level Expenses (CLE): the corporate level expenses directly related to the Planning Resource. Corporate level expenses shall include only such expenses that are directly linked to providing tangible services required for the operation or maintenance of the Planning Resource, to the extent that retirement or suspension results in a cost reduction rather than a reallocation. The categories of expenses included in CLE are those incurred for: (a) legal services, (b) environmental reporting; and (c) procurement expenses.
8. Capital Costs (CC): mandatory capital expenditures necessary to comply with federal or state environmental, safety or reliability requirements that must be met in order to supply Planning Resources. The categories of expenses that may be included in CC are those incurred for: (a) engineering, (b) procurement, (c) construction, and (d) cancellation fees. When calculating Going-Forward Costs, the IMM assumes that capital costs will be recovered across all Seasons of the Planning Year after they are incurred. The additional $/SAC-day needed to recover all capital costs in an individual Season will be included in the Default Offer (See Section 8.1).

A Market Participant shall request an updated determination of the Going-Forward Costs for each relevant Season of the Planning Year, as applicable. In the absence of such request, the Installed Capacity Supplier's Reference Level shall revert to the Initial Reference Level of $0/SAC-day. An updated determination of Going-Forward Costs may be undertaken by the ISO at any time on its own initiative after consulting with the Responsible Market Party. Any further determination of an Installed Capacity Supplier's Going-Forward Costs shall conform to the consultation and determination schedule specified in this paragraph.

The IMM shall set the facility-specific Planning Resource Reference Level equal to the Going Forward Costs per SAC-day less the net revenues the Resource would have received from the Transmission Provider's Energy and Ancillary Services Markets. The net revenues shall be calculated by the IMM to equal the revenues paid by the Transmission Provider over a recent past 24 month period during the relevant Season for Energy and Ancillary Services minus the Reference Levels for the corresponding services times the quantities of the services sold divided by the product of the days in the 24 month period during the relevant Season times the SAC of the Resource. In the event that a Generation Resource's capability or participation in the market over a recent past 24-month period is not representative of the upcoming Planning Year, the IMM will estimate net revenue based on either a more representative time period for that Resource or based on other units with similar operating characteristics.

If the above requirements are met, the IMM shall determine the level of the facility-specific Planning Resource Reference Level not later than 5 days prior to the deadline for submitting Offers to sell Planning Resources in the PRA.

The IMM will make available to the Market Participant the Reference Levels applicable to that Participant's ZRC Offers upon request.

7 Impact Thresholds

In order to avoid significant interference with the Energy and Operating Reserve Markets, or the PRA, Mitigation Measures are not imposed unless any of the conduct described in Section 6 (physical withholding, economic withholding, and uneconomic production) either causes a substantial change in Energy and Operating Reserve Market LMPs, MCPs, PRA clearing price (Price Impact), or substantially increases RSG MWPs (RSG MWP Impact). This "Impact" of anti-competitive behavior on LMPs, MCPs, PRA clearing price, or RSG MWPs is determined using the Impact Thresholds described in this section.

It is necessary to incorporate Impact Tests as the second component of the trigger for mitigation because conduct that does not have a significant effect on market outcomes is not an abuse of market power and is not mitigated through the default offer. As discussed in the following sections, mitigation may result in prospective substitution of a default offer and it may be subject to referral to FERC for further action. Impact Tests prevent mitigation in circumstances when a supplier's action exceeds a conduct threshold but the conduct has little effect on market prices or RSG MWPs.

7.1 LMP Impact Thresholds in Broad Constrained Areas

To determine whether there is a substantial price effect on the Energy Markets in a BCA with one or more Binding Transmission Constraints or Reserve Zone Constraints, the applicable Price Impact Thresholds shall be either (1) an increase of 200% or (2) $100 per MWh, whichever is lower, in an hourly Day-Ahead or Real-Time Energy LMP at any location in that BCA.

Failure of this "Price Impact Test" in a BCA affects all Resources that have failed their BCA economic withholding Conduct Test for that hour in that BCA (see Exhibit 7-1).

Exhibit 7-1: Test for LMP Impact in a Broad Constrained Area

Energy Offers failing Conduct Test resulting in an increase of 200% or $100/MWh (whichever is lower) in an Energy LMP at any location in a Broad Constrained Area
RESULTS IN
Failing **Price IMPACT Test** in that Broad Constrained Area

7.2 LMP Impact Threshold in Narrow Constrained Areas

The Price Impact Threshold used to determine a substantial price effect on an LMP in a NCA is as follows (see Exhibit 7-2):

Narrow Constrained Area Price Impact Threshold = Net Annual Fixed Cost/Constrained Hours

Where:

Net Annual Fixed Cost = Annual fixed costs of a new peaking Generator ($/MW), including recovery of annualized ($/MW) capital costs minus appropriate credits for the annual net revenue ($/MW) the new peaking Generator would receive from the Markets and Services provided under the Tariff (market revenue less variable production costs) and minus credits for any revenue ($/MW) due to resource adequacy payments, and

Constrained Hours = The total number of hours over the prior 12 months during which a Binding Transmission Constraint or Binding Reserve Zone Constraint has occurred on any Interface into the NCA in which the Resource is located, but not more than 2000 hours.

This is the same threshold value as the economic withholding conduct threshold for Energy in a NCA (see Section 6.4). In this application, however, the threshold value is used differently. For the Price Impact Test in a NCA, this same threshold value is applied to an increase in Energy and Operating Reserve Market LMPs rather than to an increase in the values of Energy or Minimum Generation Offers.

NCA Price Impact Thresholds in MISO may be accessed at: https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=%2Fimmtype%3ANCA%20Theshold&t=10&p=0&s=FileName&sd=desc located under Related Documents, see the file “YYYY NCA Thresholds.”

Failure of the Price Impact Test in an NCA affects all Resources that have failed the NCA economic withholding Conduct Test for that hour in that NCA and were tested for impact with a GSF < CFGSFC on the binding NCA constraint.

Exhibit 7-2: Test for Price Impact in a Narrow Constrained Area

Energy Offers failing Conduct Test if Energy Offers result in LMPs increase of more than the Narrow Constrained Area Price Impact Threshold = [Net Annual Fixed Cost] / [Constrained Hours] in a Narrow Constrained Area

RESULTS IN

Failing **Price IMPACT Test** in that Narrow Constrained Area on the binding NCA constraint.

7.3 Price Impact Threshold for Operating Reserves and Off-Line Short-Term Reserve in a Reserve Zone

To determine whether there is a substantial price effect on the Operating Reserve Markets in a Reserve Zone with one or more Binding Transmission Constraints, the applicable Price Impact Threshold shall be an increase of $10 per MW per Hour in an hourly Day-Ahead or Real-Time MCP for Operating Reserves and $10 per MW per Hour for Short-Term Reserve at any location in that Reserve Zone.

Failing the Price Impact Test in a Reserve Zone affects all Resources that have failed their Reserve Zone economic withholding Conduct Test for that hour in that NCA.

7.4 Price Impact Threshold for PRA Auction Clearing Price

To determine whether there is a substantial effect on PRA clearing prices for Planning Resources, the applicable threshold shall be 10 percent times the CONE value divided by the number of days in the planning year. However, for import constrained Local Resource Zones, the threshold to determine a substantial effect on Auction Clearing Prices for Planning Resources shall be an increase in the Auction Clearing Price equal to $0/MW-day.

7.5 Real-Time and Day-Ahead Revenue Sufficiency Guarantee (RSG) Credits Impact Threshold

To determine whether there is a substantial change in RSG credits (make-whole payments) for a Resource, the applicable RSG Impact Threshold (including credits paid to Resource Voltage and Local Reliability Commitments) is an increase of $0 per MW per hour in either the Day-Ahead or Real-Time RSG make-whole payments to an MP for that Resource for an OD (see Exhibit 7-3).

Exhibit 7-3: Test for Revenue Sufficiency Guarantee Make-Whole Payment Impact

Increase of greater than $0 per MW per hour in the daily Day-Ahead or Real-Time Revenue Sufficiency Guarantee Make-Whole Payment (RSG MWP) to an MP for an individual Resource

RESULTS IN

Failing **Revenue Sufficiency Guarantee Payment IMPACT Test**

7.5.1 Monitoring and Mitigation of Revenue Sufficiency Guarantee Make-Whole Payments (RSG MWP) and Price Volatility Make-Whole Payments (PVMWP)

RSG and PVMWP serve to protect from financial harm Resources that provide Capacity and/or Energy needed for reliability or dispatch flexibility, or that follow setpoint or dispatch instructions, and, in doing so incur losses due to the differences that arise between the ex-ante, five minute prices used to dispatch units and the ex post, hourly market prices used to settle the markets. RTORSGP applies to Resources dispatched above their DA Schedules; DAMAP applies to Resources dispatched below their DA Schedules.

The IMM will assess RSG MWP and PVMWP (both DAMAP and RTORSGP) amounts made to Market Participants using thresholds discussed in Section 6 to identify potential manipulation. The Transmission Provider shall remove eligibility for Day-Ahead Revenue Sufficiency Guarantee Credit, Real-Time Revenue Sufficiency Guarantee Credit, Day-Ahead Margin Assurance Payment, Real-Time Offer Revenue Sufficiency Guarantee Payment, and Undeployed Regulating Mileage Revenue Sufficiency Guarantee of any Resource that is determined to be manipulating or gaming any of the make-whole payment mechanisms to extract undue payments. Such manipulation or gaming shall be determined in accordance with the criteria in Section 63 of the Tariff.

The IMM will make a referral to FERC if it has a credible reason to believe a Market Participant is violating market rules or engaging in manipulative conduct to increase these payments.

8 Application of Default Offers, Penalty Charges, Load Measures and Virtual Transaction Measures

This section defines the specific measures that may be taken when mitigation is triggered by exceeding both Conduct and Impact Thresholds, including:

1) Substituting Default Offers for Offers (Section 8.1)
2) Applying Penalty Charges for physical withholding, uneconomic production, exceeding an LSE's Allowance Level, or operating transmission equipment so as to cause transmission congestion (Section 8.2)
3) Requiring LSEs to purchase most of their Energy day-ahead (Section 8.3)
4) Placing restrictions on Virtual Transactions (Section 8.4)

8.1 Default Offers

A Default Offer is a modified Offer for a Resource determined by the IMM to replace the portions of the unit's Offer that exceed the Conduct and Impact Tests with the applicable Reference Levels. A Default Offer may replace any component(s) of a Energy, Operating Reserve or Off-Line Short-Term Reserve Offer, including:

1) One or more of the Energy prices in an Offer (Energy Offers include up to ten MW/Price pairs),
    - For Energy prices, the Default Offer's substituted values are set equal to or as close to the Reference Level values as possible, taking into account the requirement that Energy Offer prices must be monotonically increasing.
2) No-Load Offer (minimum generation cost is derived from the No-Load Offer and the Energy Offer at Dispatch Minimum),
3) Start-up Offer (Cold, Intermediate, and Hot),
4) Operating Reserve Offers,
5) Off-Line Short-Term Reserve Offers,
6) Time-based parameters, or
7) Other Offer parameters.

A Default Offer may replace any component(s) of a DRR Type I Offer, including:

1) Energy price in a DRR Type I Offer,
    - For Energy prices, the Default Offer's substitute values are set equal to or as close to the Reference Level values as possible.
2) Curtailment Offer,
3) Shutdown Offer.

Substituting a Default Offer for a supplier's as-submitted Energy, Operating Reserve or Off-Line Short-Term Reserve Offer causes an MP to offer as if it faced workable competition during a period when both of the following apply:

1) The MP does not face workable competition, and

2) The MP has engaged in either:
    a) Economic withholding (typically determined day-ahead or in real-time and permitting prospective substitution of Default Offers), or
    b) Uneconomic production from an Electric Facility involving Energy generated at a location where the LMP is less than 50% of the applicable Reference Level (typically determined day-ahead or in real-time and permitting prospective substitution of Default Offers)

In determining and implementing Default Offers, the IMM will, in light of the information available and the Reference Levels as described in Section 6.9, avoid causing a Resource to offer below its marginal cost.

When the conditions for substituting a Default Offer have been satisfied, the as-submitted component of the Offer is replaced by the Reference Level value. Any of the following Generation Offer components may be substituted:

1) Energy Offer ($/MWh)
2) Minimum Generation Offer ($/Hr) – Default Offers are substituted either for the No-Load Offer, for the Energy Offer at Dispatch Minimum or both
3) Start-Up Offer ($)
4) Operating Reserve Offers, including:
    a) Spinning Reserve Offer
    b) Supplemental Reserve Offer
    c) Regulation Offer
5) Off-Line Short-Term Reserve Offer
6) Time-based Offer Parameter (e.g., Start-Up Time, Minimum Run Time, Minimum Down Time, Cold Startup Time and Hot Notification Time)
7) Offer Parameter in Units Other Than Time or Dollars (e.g., Ramp Rate, Maximum Number of Daily Starts, Maximum Weekly Energy, commitment status and dispatch status).

Any of the following DRR Type I Offer components may be substituted:

1) Energy Offer ($/MWh)

2) Curtailment Offer ($/Hr)
3) Shutdown Offer ($)

Only the component or components that meet the conditions for substituting a Default Offer are substituted; all other Offer prices and Offer components remain as submitted.

Default Offers may be substituted in the presence of binding BCA, NCA, or VLR constraints in day-ahead, in real-time, or in the Settlement of RSG MWPs.

1) ***Day-Ahead*** – based on Conduct and Price Impact Tests in the Day-Ahead Energy and Operating Reserve Market
2) ***Real-Time*** – based on Conduct and Price Impact Tests in the Real-Time Energy and Operating Reserve Market
3) ***Settlement of RSG Make-Whole Payments*** – based on Conduct and RSG MWP Impact Tests.

Default Offers apply to economic withholding in either an NCA or a BCA. They remain in effect for the duration of any hour in which there is an interval for which the mitigation is deemed warranted.

Default Offers also apply to Planning Resources. Portions of Planning Resource Offers that exceed Conduct and Impact Tests are substituted with Default Offers only for the affected PRA. The Default Offers are based on Reference Levels ($0 or approved FSRL) plus the following costs, where applicable:

1) A resource's residual unrecovered annual FSRL costs (the $ per SAC-day difference between recovering annual capital expenditures in a single season versus the entire planning year—see Section 6.9.4);
2) A resource's expected penalty cost (from CRNCC) based on known outages at the time of the auction; and
3) A resource's expected accreditation cost based on known outages at the time of the auction without Tier 2 exemptions.

The portions of the Planning Resource Offers that do not exceed the Conduct and Impact Tests are unaffected.

8.1.1 Day Ahead Automated Mitigation Procedure (AMP)

MISO employs an Automated Mitigation Procedure (AMP) for the day-ahead market. Under the day-ahead AMP, the Impact Test is performed and mitigation is implemented on the same market day that the conduct occurred.

If the AMP becomes unavailable to complete such functions in a timely manner, the following process will be employed:

1) Resources with DA Offers that fail the conduct test will undergo the Impact Test;
2) If these Resources fail the Impact Test for the given OD, all Resources owned by the same supplier in the same NCA or active BCA will be considered for mitigation for the following day;
3) When the day-ahead market is run for the following day, Resources considered for mitigation in Step 2 and that submit a conduct test-failing Offers will have a Default Offers substituted for the failing Offers;
4) If the same supplier submits day-ahead Offers that exceed both conduct and impact thresholds for the same NCA or active BCA within the next 90 days, the supplier's Resources in that NCA or active BCA will be considered for mitigation in the day-ahead Market for the following seven days
5) If in any of these seven days, the Resource identified in Step 4 submits an Offer that fails the Conduct Test, a Default Offer shall be substituted for the failed Offer.

8.1.2 Substituting Default Offers in Real-Time

The substitution of Default Offers in the Real-Time Energy and Operating Reserve Market is tested and applied during each interval of real-time operations. Conduct testing for the Real-Time Energy and Operating Reserve Market is performed once an hour just after the Real-Time Energy and Operating Reserve Market closes (i.e., beginning just after thirty minutes before the start of each Operating Hour (OH), designated as "OH-30m"). During this period, prior to the start of the next OH, the MMM process performs economic withholding Conduct Tests on all Real-Time Offers and flags any Resources that fail one of these tests.

Once the OH begins, the MMM process tests flagged Resources for Price Impact during every Dispatch Interval and substitutes Default Offers for Real-Time Offers submitted for the remainder of that hour that fail their Price Impact Test and a Binding Transmission Constraint or Binding Reserve Zone Constraint is active.

Midway through the current OH and after the subsequent OH bids close at "OH+30m", the initial process is repeated for new Offers for the subsequent OH ("OH+1h").

Near the end of the current OH, Resources that failed Conduct and Impact tests during the current OH are retested. If either Conduct or Impact Tests (based upon Offers for the next hour and projected LMPs and MCPs for the next hour) no longer fail for a multi-hour Offer, the mitigation

measures will be removed at the end of the OH and Default Offers will not be used for that Resource in the next OH ("OH+1h"). If both Conduct and Price Impact Tests still fail, the Mitigation Measures are continued for the next OH.

The specific steps involved in the hourly real-time mitigation process are as follows (see Exhibit 8-1):

1) After the Real-Time Energy and Operating Reserve Market closes prior to each OH ("OH-30m"), the MMM process:
    a) Compares Real-Time Energy Offers from Resources selected in the Real-Time Energy and Operating Reserve Market for the next OH to their respective Reference Levels to detect those over their respective conduct thresholds (Section 6.3 or 6.4)
    b) Flags Resources that fail one of their Conduct Tests
2) After the OH begins, during every Dispatch Interval, the MMM process:
    a) Performs Price Impact Tests on all flagged Resources using the LMPs and MCPs calculated for each Dispatch Interval
    b) Substitutes Default Offers for the appropriate components of any Offer from a flagged Resource that fails its Price Impact test
    c) Uses the Default Offer for the remainder of OH
    d) Notifies MPs whenever one or more of their OH Real-Time Offer components has been mitigated
3) After the Real-Time Energy and Operating Reserve Market closes ("OH+30m") for the subsequent hour ("OH+1h"), the MMM process:
    a) Repeats step 1) above
4) Near the end of the current OH, the MMM process:
    a) Retests Offers that were mitigated in OH to determine continuing Conduct Test failure and Impact Test failure in the subsequent hour ("OH+1h") for any of their bid components that were mitigated in the OH
    b) Flag the mitigated Resource to either continue or discontinue Mitigation Measures as warranted, starting at the beginning of "OH+1h"
    c) Notify the MP that mitigation of one or more of its Offer components is still in effect for "OH+1h" if mitigation is still warranted.

Exhibit 8-1: Timeline for Real-Time Economic Withholding

AFTER "OH" REAL-TIME MARKET CLOSES
Perform the economic withholding Conduct Test for all Real-Time Offers from Resources in both Broad and Narrow Constrained Areas for the next Hour (see Exhibits 6-3 & 6-4)
Identify any Real-Time Offer that exceeds a conduct threshold (Energy Offer or Minimum Generation Offer)
Flag any Resource whose Offer fails its Conduct Test (but do not mitigate at this point)
DURING THE OPERATING HOUR ("OH")
For any flagged Resource, perform the appropriate Broad or Narrow Constrained Area Price Impact Test on any Real-Time Offer that failed its Conduct Test
For any flagged Resource that fails its Price Impact Test, substitute a Default Offer for the failed component(s) of Its Offer and use this for the remainder of "OH"
Notify the corresponding MP that one or more of its "OH" Offer components has been mitigated
AFTER "OH+1" REAL-TIME MARKET CLOSES
Repeat steps listed in AFTER "OH" MARKET CLOSES above
NEAR THE END OF OPERATING HOUR "OH"
Retest for "OH+1h" all Real-Time Offers that were mitigated in "OH"
Flag Real-Time Energy and Operating Reserve Market Offers that were mitigated in "OH" to either continue or discontinue mitigation at the beginning of "OH+1h"
Notify appropriate MPs that one or more of their "OH+1h" Offer components will continue to be mitigated in "OH+1h"

8.1.3 Substituting Default Offers in the Settlement of RSG Make-Whole Payments

The MMM process substitutes Default Offers in Settlement of RSG following the failure of an RSG MWP Impact Test commitment (see Exhibit 7-3) to resolve BCA, NCA, or VLR constraints. This substitution modifies the RSG make-whole payment to the Resource that will be determined in the MISO Market Settlement calculations.

8.1.4 Market Settlement Following Substitution of Default Offers

MPs are paid for Energy and Operating Reserves, Short-Term Reserves, and Planning Resources on the basis of LMPs, MCPs, and PRA clearing prices regardless of the substitution

of Default Offers. A Resource subject to a Default Offer is still paid the applicable LMP and/or MCP. A Default Offer does not limit the price that a Resource may receive unless the Default Offer sets the applicable LMP or MCP. MISO will not use a Default Offer to revise market clearing prices for periods prior to the imposition of the Default Offer unless specifically authorized by FERC.

RSG MWPs are paid, when necessary, based on mitigated Default Offers if these offers are imposed.

8.1.5 Non-Price Offer Parameters, Uneconomic Production and Physical Withholding

When a non-price Offer parameter (e.g., Start-Up Time) fails its conduct threshold and an Impact Threshold is also exceeded, per the procedures outlined in the MISO procedure SO-P-NOP-00-423 "Market Mitigation Measures for Physical Offers Parameters", MISO may substitute a Default Offer for the Offer parameter if this does not conflict with the physical capabilities of the Resource. In this manner, the Default Offer is used prospectively to limit a substantial change in a non-price Offer parameter.

Alternatively, where the supplier claims that the physical characteristics of the Resource require a substantial change in a non-price Offer parameter and a subsequent investigation reveals that the change was not justified and it was not possible to substitute a Default Offer prospectively, the conduct may be subject to sanctions as uneconomic production or physical withholding by utilizing a Penalty Charge (see Section 8.2).

IF	THEN
Supplier claims physical characteristics of Resource require substantial change in non-price Offer parameter, change wasn't justified, and it wasn't possible to substitute a Default Offer	The conduct may be subject to sanctions as uneconomic production or physical withholding by utilizing a Penalty Charge (see Section 8.2).

The Default Offer is the preferred approach for mitigating this conduct since it is prospective and prevents the conduct from affecting market outcomes.

8.2 Penalty Charges

Except as otherwise specified in Module D, maximum sanction amounts will be calculated by the IMM. MISO will administer the penalties and the IMM will perform the monitoring of conduct and impact that may trigger the Tariff's penalty provisions and make recommendations to MISO to implement (as authorized) or to make the appropriate filings with FERC to seek penalties. Where

not authorized to assess penalties, and upon FERC approval, MISO will assess a Penalty Charge against an MP up to the amounts defined in this section, if the MP's conduct has caused a substantial increase in one or more prices or RSG MWPs in the Energy and Operating Reserve Markets, PRA, or other markets administered by MISO, and either the conduct cannot feasibly be remedied by the prospective application of a Default Offer, or it is otherwise appropriate in order to deter the conduct.

The types of conduct that can lead to Penalty Charges are as follows:

1) An MP has engaged in physical withholding (see Sections 6.1, 6.2 and 6.3)
2) An MP has engaged in economic withholding (see Sections 6.4, 6.5, 6.6 and 6.7)
3) An MP has engaged in uneconomic production (see Section 6.8)
4) An LSE has been assessed a Penalty Level Purchase payment in connection with the Load Measures described in Section 8.3
5) A TO has taken unjustified actions that caused or worsened a Binding Transmission Constraint or Binding Reserve Zone Constraint, including operating network control devices in a manner that is not economic and is not consistent with Good Utility Practice.

Penalty Charges do not apply in certain cases:

1) Penalty Charges apply to a Resource **only** if it is located in a Broad or Narrow Constrained Area with a Binding Transmission Constraint or Binding Reserve Zone Constraint
2) Penalty Charges do **not** apply to economic withholding when there is sufficient time and information to prospectively substitute a Default Offer
3) Resources that are not designated to satisfy resource adequacy requirements (see Tariff Module E-1) are **not** subject to Penalty Charges for physical withholding from the Day-Ahead Energy and Operating Reserve Market or Reliability Assessment Commitment process.

Upon receipt of a sanction from the IMM, MISO will exercise its judgment as to whether the Tariff has been violated and whether any associated Penalty Charge may be proper. Real-Time LMPs are not revised retroactively as a result of the imposition of a Penalty Charge except as specifically authorized by FERC. Penalty Charges imposed by MISO are billed as a specific Settlements line item. With the exception of the Load Measures described in Section 8.3.4, all Penalty Charges are credited along with other costs collectable under the Tariff. The formulas used to determine the Penalty Charges in Sections 8.2.1 and 8.2.2 below determine the maximum Penalty Charges that may be assessed. MISO may, at its sole discretion, determine when Penalty Charges below the maximum level would be appropriate.

An MP has engaged in uneconomic production that was not able to be mitigated prospectively (specifically, either real-time output from a Resource that exceeded the conduct thresholds described in Section 6 and the applicable impact thresholds in Section 7 is subject to sanction by MISO as described in Section 65.3 of the tariff.

8.2.1 Determination of Base Penalty Charge

Penalty Charges are determined by assessing a penalty up to the product of the Base Penalty Charge times the appropriate multiplier (specified in Section 8.2.2). The Base Penalty Charge is determined as follows (see Exhibit 8-2):

Base Penalty Charge = (Capability (MW) Affected)*(Penalty Price during Penalty Hours)

Where:

1) Penalty Price means:
    a) For a Resource, the LMP applicable to the withheld Energy or the MCP applicable to the withheld Operating Reserves or Short-Term Reserves at the Commercial Pricing Node most affected by the conduct.
    b) For a Planning Resource, the Auction Clearing Price (ACP) applicable to the withheld capacity.
    c) For an MP (on behalf of an LSE), the LMP or MCPs at the location of the Load being served
    d) For a TO, the shadow price on the withheld transmission facility.
2) Penalty Hours means:
    a) For the Day-Ahead Energy and Operating Reserve Market, the hours in which the conduct occurred
    b) For the Real-Time Energy and Operating Reserve Market, the hours in the Calendar Day from when the conduct first occurred until the hour after conduct ended
    c) For the PRA, the number of days in the planning period
    d) For Demand Bids, the hours causing Penalty Level Purchase payments.
3) Capability (MW) Affected includes one of the following items:
    a) The quantity of Resource's output or Planning Resource's capacity physically withheld or uneconomically produced
    b) The transmission capability reduced by a TO
    c) The Load under-scheduled by an MP serving Load on behalf of an LSE. Capability (MW) Affected does not include economically withheld Resources

Exhibit 8-2: Calculation of Base Penalty Charge

Resource

Base Penalty Charge for a Resource is the product of the following 3 terms:
Amount of Energy, Operating Reserve, or Short-Term Reserves Physically Withheld or Uneconomically Produced
X
Hours When Conduct Occurred
X
LMP or MCP at Resource Bus

Planning Resource

Base Penalty Charge for a Planning Resource is the product of the following 2 terms:
Amount of Planning Reserve Physically Withheld
X
The number of days in the planning period
X
PRA Clearing Price

Load

Base Penalty Charge for a Load is the product of the following 3 terms:
Amount of Load Under-scheduled
X
Hours Causing Penalty Level Energy Payments
X
LMP or MCP at Load Bus

8.2.2 Penalty Multipliers

The Base Penalty Charge described above for conduct by an MP or its Affiliates is subject to one of the following multipliers to determine the full amount of the Penalty Charge:

1) For the first instance of conduct meeting the requirement for mitigation, the multiplier is one (1),
2) For the second instance within 18 months of substantially similar conduct associated with the same product (e.g., Energy, regardless of whether it is in the Day-Ahead or Real-Time Energy and Operating Reserve Markets), the multiplier is two (2), and

3) For the third instance or any additional instances within 18 months of substantially similar conduct regarding the same product, the multiplier is three (3).

8.2.3 Market Settlement of Penalty Charges

Except as provided in Section 8.3.4 below, amounts collected as Penalty Charges will be credited against costs collectable under the Tariff Schedule 17: “Energy and Operating Reserve Market Support Administrative Service Cost Recovery Adder”.

8.3 Load Measures

MPs may choose to purchase power for associated LSEs in either the Day-Ahead Energy and Operating Reserve Market or the Real-Time Energy and Operating Reserve Market. However, certain Demand Bid practices may prevent Real-Time LMPs from converging with Day-Ahead LMPs as might be anticipated in a workably competitive market. In these cases, MISO may impose Load Measures on MPs that distort market outcomes.

8.3.1 Monitoring Day-Ahead and Real-Time LMPs

The IMM performs periodic reviews of Day-Ahead and Real-Time LMPs to determine whether there is a persistent hourly deviation between them at any location that would not be expected in a workably competitive market.

To accomplish this, the IMM computes the Average Hourly Deviation between Day-Ahead and Real-Time Ex-Post LMPs at all locations, as measured with the following formula:

Average Hourly Deviation = (Hourly Real-Time Ex-Post LMP / Hourly Day-Ahead LMP) - 1.

The Average Hourly Deviation is computed over a rolling four-week period (or another period determined by the IMM to be appropriate for this calculation) using a four-week moving average.

8.3.2 Conditions to Impose Load Measures

The IMM monitors the average percentage of each LSE's Load that is scheduled in the Day-Ahead Energy and Operating Reserve Market in order to identify any sustained pattern of under-bidding, using measures that include the following calculations:

Average % Load Scheduled Day-Ahead = (Load Scheduled Day-Ahead / Real-Time Load)*100

The Average Percentage Load Scheduled Day-Ahead is computed over an appropriate time period.

The Load Measures described in Section 8.3.3 may be imposed if the IMM determines that all of the following are occurring (see Exhibit 8-3):

1) The Average Hourly Deviation between Day-Ahead and Real-Time LMPs (see Section 8.3.1) is greater than 10% or less than –10%,
2) The MP on behalf of one or more LSEs is meeting a substantial portion of its Load with purchases in the Real-Time Energy and Operating Reserve Market,
3) This practice contributes to an unwarranted divergence of the LMPs between the two markets, and
4) This practice creates operational problems as determined by the IMM in concert with MISO.

When a Load Measure is imposed, a description of this problem is posted on the MISO website.

Load Measures are rescinded when the IMM determines that the conditions defined above that required their imposition are no longer met.

Exhibit 8-3: Imposition of Load Measures

IF ALL OF THE FOLLOWING

The Average Hourly Deviation between Day-Ahead and Real-Time LMPs is >10% or < –10%
LSE meets a substantial portion of its Load with purchases in the Real-Time Energy and Operating Reserve Market
LSE's Demand Bids contribute to an unwarranted divergence between Hourly Day-Ahead LMPs and Hourly Real-Time Ex-Post LMPs
LSE's Demand Bids create operational problems

THEN

Impose Load Measures requiring the LSE to purchase essentially all its Energy in the Day-Ahead Energy and Operating Reserve Market, with Real-Time Energy and Operating Reserve Market purchases limited to an Allowance Level and purchases above this subject to Penalty Charges

8.3.3 Determining Load Measures

Once the IMM determines that an MP has engaged in the purchasing practices described in Section 8.3.2, the MP making purchases on behalf of LSEs may be required to purchase or schedule essentially all of its expected power requirements in the Day-Ahead Energy and Operating Reserve Market. However, this MP may still purchase up to a specified percentage of its actual hourly Load requirements (the Allowance Level) in the Real-Time Energy and Operating Reserve Market without penalty. The Allowance Level is determined by the IMM to recognize the uncertainty of Load forecasting.

Once a Load Measure has been imposed, however, all purchases in the Real-Time Energy and Operating Reserve Market in excess of the Allowance Level (Penalty Level Purchases) are subject to a Penalty Charge (see Section 8.2).

The Allowance Level is established at a level that is considered effective and appropriate to mitigate the market effects of the Load bidding practices described in this section. Penalty Level Purchase penalties are not imposed in any hour in which the Allowance Level is exceeded due to unexpected system conditions.

8.3.4 Market Settlement of Load Measures

Revenues from the Penalty Charges, if any, for Energy purchases in the Real-Time Energy and Operating Reserve Market in excess of the Allowance Level (Penalty Level Purchases) are

rebated on a *pro rata* basis to the MPs that scheduled Energy for delivery in the Day-Ahead Energy and Operating Reserve Market for the Day in which the revenues are collected.

8.4 Virtual Transaction Measures

Certain virtual market practices may cause Day-Ahead LMPs not to achieve the degree of convergence with Real-Time LMPs that would be expected in a workably competitive market. The IMM monitors Day-Ahead and Real-Time LMPs to determine whether there is a persistent hourly deviation between them in any location. Under these conditions, MISO may take specific Virtual Transaction Measures to prevent this (see Section 8.4.2).

8.4.1 Conditions to Impose Virtual Transaction Measures

Uneconomic Virtual Transactions may contribute to an unwarranted divergence between LMPs established in the Day-Ahead and Real-Time Energy and Operating Reserve Markets if they are used to create congestion or otherwise influence prices or Resource commitments in the Day-Ahead Energy and Operating Reserve Market. Virtual Transaction Measures described in Section 8.4.3 may be imposed if the IMM determines that both of the following have occurred (see Exhibit 8-4):

1) The Average Hourly Deviation between Day-Ahead and Real-Time LMPs (see Section 8.3.1) is greater than 10% or less than –10%, and
2) The virtual market practices of an MP have contributed to the unwarranted divergence of LMPs between the two markets based on the Average Hourly Deviation between Day-Ahead and Real-Time Ex-Post LMPs.

Exhibit 8-4: Imposition of Virtual Transaction Measures

IF BOTH OF THE FOLLOWING
The Average Hourly Deviation between Day-Ahead and Real-Time LMPs is > 10% or < –10%
Virtual market practices contribute to an unwarranted divergence between Hourly Day-Ahead LMPs and Hourly Real-Time Ex-Post LMPs
THEN
Impose Virtual Bidding Measures that limit hourly quantities of Virtual Transactions at specific locations and/or restrict Virtual Bidding to Aggregate Nodes or Hubs

8.4.2 Determining Virtual Transaction Measures

If the IMM determines that both the conditions described in Section 8.4.1 exist, MISO may limit the hourly quantities of Virtual Transactions that an MP may submit at a location. For a period of three months, the IMM will restrict the MP from submitting any Virtual Transactions at the same Nodes (or electrically similar Nodes) where the MP had submitted the Virtual Transactions that contributed to the unwarranted divergence between LMPs in the Day-Ahead and Real-Time Energy and Operating Reserve Markets.

Virtual Transaction Measures are rescinded when the IMM determines that the conditions defined above that required their imposition are no longer met. In general, no restrictions on Virtual Transactions will extend beyond six months after the occurrence of the conduct that triggered the measure.

The IMM may also request explanations of the relevant virtual bidding practices from any MP submitting Virtual Transactions that contribute to LMP divergence.

8.4.3 Verifying Compliance with Virtual Transaction Measures

The day-ahead MMM process verifies that new Virtual Transactions comply with any Virtual Transaction Measures that are currently in effect. Since Virtual Transactions may be submitted up to seven days in advance, new Virtual Transaction Measures may be applied to Virtual Transactions that were previously validated.

9 Monitoring of Demand Response Resources (DRRs)

9.1 Description

A Demand Response Resource – Type I (DRR-I) is defined as a Resource hosted by an Energy Consumer or LSE that is capable of supplying a specific quantity of Energy or Contingency Reserve, at the choice of the MP, to the Energy and Operating Reserve Market through physical Load interruption. A Demand Response Resource – Type II (DRR-II) is defined as a Resource hosted by an Energy Consumer or LSE that is capable of supplying a range of Energy, Operating Reserve, and/or Short-Term Reserve at the choice of the MP, to the Energy and Operating Reserve Market through Behind-the-Meter Generation and/or controllable Load.

9.2 IMM's Role

It is difficult, if not impossible in some cases, to determine appropriate Reference Levels for DRRs and apply mitigation to them using the conduct and impact approach. Therefore, in order to monitor DRRs for potential market power, the IMM will:

1) Monitor DRRs in a manner comparable to Generation Resources;
2) Notify FERC of any behavior by a DRR that the IMM has reason to believe has violated applicable market rules;
3) Assess and report on uplift charges associated with any make-whole payments paid to these DRRs; and
4) Assess and report on the market effects of DRRs in MISO's markets, including any market benefits and perceived market power risks, as part of its annual State of the Market Report.

10 Data Collection and Confidentiality

This section discusses the data collected by the IMM for its market monitoring activities and defines the data flow between MPs, MISO, and the IMM. The section also explains that sensitive data is kept confidential and indicates under what conditions it may be released to government agencies.

10.1 Market Monitoring Plan Data Provided by MISO

To carry out its responsibilities under the MMM Plan, MISO provides the IMM with data and other information gathered or generated in the course of its operations. This data and information include the following items:

1) Hourly schedules, Generation, Operating Reserve and Short-Term Reserve Offers, and actual unit output for the Resources in the MISO Region (as well as designated Network Resources outside MISO) and imports to and exports from the MISO Region
2) Reserved and scheduled Transmission Service into, out of, or through MISO
3) Transmission limits (including temporary deratings) on each of the monitored Flowgates and other significant transmission facilities
4) Hourly flow over each of the monitored Flowgates and other significant transmission facilities
5) Dispatch of generation for Energy, Operating Reserve, Short-Term Reserve, Regulation, frequency or other operational orders, including MISO or Local Balancing Authority Area operating logs or other information associated with this dispatch
6) Redispatch of generation or other actions taken to manage transmission congestion
7) Logs of transmission requests, including the dispositions of the requests and the explanation for any refused or cancelled requests
8) Logs of Resource interconnection requests, including the results of the requests and the explanation of any refused requests
9) Generation and transmission facility Outage data
10) Records of complaints by customers of MISO
11) Actions taken by Local Balancing Authority Operators to deploy or maintain reserves and Regulation, request commitment of Resources, or re-dispatch Resources, including operating logs and other pertinent information
12) Any other information already required or necessary to be provided to MISO.
13) Logs of operator actions, determinations, or communications with Market Participants
14) Operating procedures and training materials

10.2 Market Monitoring Information Provided by MPs, TOs and Local Balancing Authority Operators

In addition to the information listed in Section 10.1, the following information may be obtained by the IMM from MPs, TOs, Local Balancing Authority Operators, or MISO. These entities must retain the following categories of data or information for at least two years:

1) ***Production Costs*** – Information relating to the costs of operating an Electric Facility including, for Generation Resources, heat rates, start-up fuel requirements, fuel purchase costs, environmental costs, and operating and maintenance expenses; and, for Stored Energy Resources, data including, but not limited to, Hourly Energy Storage Loss Rates.
2) ***Opportunity Costs*** – Information relating to regulatory, environmental, technical, or other restrictions that limit the run-time or availability, or other operating characteristics of a Resource, Demand Response Resource-Type I and Demand Response Resource-Type II.
3) ***Generating and Stored Energy Resource Logs*** – Information relating to the operating status of a Generation Resource or Stored Energy Resource, including logs showing the resource's status, such as a forced Outage or derating, and information related to any Resources called out-of-merit order or dispatched under any other operating order from MISO or a Local Balancing Authority Area Operator.
4) ***Transmission Logs*** – Information relating to the operating status of a transmission facility, the calculation of facility ratings (including contingencies, and other operating considerations).
5) ***Bidding Agreements*** – Information relating to the ability of an MP or its Affiliate to determine the pricing or output level of generating or storage capacity owned by another entity, including any document establishing the terms or conditions of that ability.
6) ***Demand Response Resource-Type I and Demand Response Resource Type II information*** – Data or information related to the capability of a Demand Response Resource to reduce its consumption of electricity, or related to actual reductions in consumption of electricity achieved during specific events.
7) ***Physical Operating Parameters*** – Data or information relating to the operating characteristics of a Generation Resource or a Stored Energy Resource, including but not limited to: ramp rates, emergency limits, minimum run times, start times, and other temporal or operating parameters associated with a specified Electric Facility including, but not limited to, the underlying assumptions, design criteria, and methods used to determine Electric Facility ratings.

8) ***Planning Resources and Capacity Transaction Opportunities*** – Data or information related to the opportunity to sell Capacity bilaterally or exporting Capacity to other markets, and data associated with capacity accreditation, including but not limited to GVTC data, generation availability data, NERC Generation Availability Data System (GADS) information, and data associated with demonstrating deliverability.
9) ***Capacity Transaction*** – Data or information relating to bilateral Capacity sales or Capacity exports
10) ***Going-forward Costs*** – Data or information related to the costs of keeping a Resource in operation.
11) ***LSE Forecasted Demand*** – Data or information relating to LSEs' forecasted demand.

The information that the IMM routinely requests is limited to information that is not unduly burdensome or expensive to provide and that is relevant to the MMM Plan responsibilities. The IMM does not request summaries, analyses, or reports of data that do not exist at the time of the request. The IMM notifies the MPs, and provides an opportunity for comment, prior to creating or changing the list of routine information being requested.

If the IMM determines that additional information is needed to implement the MMM Plan, the IMM may request the entities that have this information to provide it. The IMM's request will explain the need for the information, a description of the format for the information, and an acknowledgment of the IMM's obligation to maintain the confidentiality of the information. MPs may also wish to provide additional data to the IMM to support their negotiations over setting Resource Reference Levels.

An MP receiving an information request from the IMM must furnish all information, in the requested format, that is either (i) included in one of the eleven categories of information listed above or else (ii) reasonably necessary to achieve the purposes or objectives of the MMM Plan, is not subject to a legal privilege and is not readily available from some other source that is more convenient, less burdensome and less expensive.

After receiving a request for information, the MP must promptly provide it to the IMM, and may not contest the right of the IMM to obtain the information unless it believes that the information is not included in any of the categories on the above list.

Prior to or after the submission of information, either the MP or the IMM may invoke MISO's Dispute Resolution Procedures, including binding arbitration, to determine the IMM's right to

obtain requested information not contained on the above list. The MP may also contest the request for information with FERC.

If the entity involved is not subject to the MISO Dispute Resolution Procedures, does not voluntarily agree to use comparable procedures, and has not contested the request with the FERC, either MISO or the IMM may initiate judicial or regulatory proceedings to compel the MP to produce the requested information.

10.3 Data Exchange with External Entities

MISO exchanges real-time and projected information with PJM to enhance system reliability and efficient market operations.

1) The following real–time operating data is typical of the information exchanged with PJM:
    a) Generation status of the units in each Region
    b) Transmission line status
    c) Real-time Loads
    d) Scheduled use of reservations
    e) NERC Transmission Loading Relief Procedures (TLR) information, including calculation of Flowgate Energy flows
    f) Redispatch information, including the next most economical generation block to decrement/increment
    g) Real-time constraints
2) The following projected operating data is typical of the information exchanged with PJM:
    a) Unit commitment/merit order
    b) Maintenance schedules
    c) Forced Outage rates
    d) Firm purchase and sales
    e) Independent Power Producer information, including current operating level, projected operating levels and Outage start and end dates
    f) Planned and actual operational start-up dates for any permanently added, removed or significantly altered transmission segments and Resources.

In addition, MISO has agreed to participate with PJM and the Tennessee Valley Authority (TVA) in a three-way exchange of grid operational data in order to coordinate power flows between their systems.

10.4 Access to Market Monitoring Data by Government Agencies

MISO and the IMM are obligated to respond to requests for information, including Confidential Information, from FERC and state regulatory agencies.

If FERC requests Confidential Information, the IMM provides this information as soon as possible. When Confidential Information is supplied to FERC, the IMM asks that FERC and its staff treat the information as confidential and non-public and that they withhold the information from public disclosure. The IMM also notifies the MP that originally provided the requested information that the IMM has received a request for disclosure of Confidential Information as soon as the IMM is notified by FERC or its staff.

If a state regulatory agency requests information provided by an MP that was not identified as confidential (e.g., as competitively or "commercially sensitive") by the MP, the IMM shall provide the non-confidential information. If a state regulatory agency requests Confidential Information that is identified and justified to the IMM as confidential (*e.g.*, as competitively or "commercially sensitive") by the MP, the following process applies:

The state regulatory agency must first be accredited as an Authorized Agency, and designate Authorized Requestors with duly executed Non-Disclosure Agreements ("NDAs"), in accordance with the Tariff. For this purpose, the state regulatory agency must provide to the IMM the statutory authority, obligation or agreement specifying the agency's duty, responsibility or authority to request the information and a statement identifying the specific statute, regulation or practice that requires the state regulatory agency to keep the disclosed information confidential and non-public, to limit distribution within the state regulatory agency and to prevent disclosure of the information to third parties. The IMM notifies the MP that provided the information that a request for Confidential Information has been received.

In addition, the Authorized Requestors of state regulatory agencies may participate in meetings or teleconferences with the IMM where Confidential Information is discussed verbally.

10.5 Confidentiality of Market Monitoring Information

MISO and the IMM are responsible for protecting the confidentiality of all information obtained for the MMM process. In particular, information designated as confidential by MPs, including proprietary and competitively and commercially sensitive data that is not available from public sources, is protected.

Upon request, Confidential Information may be released directly to FERC and Authorized Agencies under the terms of a protective order or other procedures of that agency for protecting Confidential Information. MISO and the IMM will request that FERC keep this information confidential as specified in 18 C.F.R. § 388.112. In the case of Authorized Agencies, MISO and the IMM verify the statutory authority of the agency to obtain the information, and the statute, regulation or practice that allows the agency to keep the information confidential and non-public and prevent disclosure to third parties (see Section 38.9.4 of the Tariff).

The IMM does not disclose Confidential Information to other entities without the prior written consent of the MP. If a subpoena for Confidential Information is received from an entity other than FERC or a state regulatory commission, the MP is notified and the IMM and MISO provide all reasonable assistance to prevent its disclosure. If possible under the terms of the subpoena, the IMM and MISO do not release Confidential Information until the MP gives written consent or until the MP's legal avenues are exhausted.

The IMM will respond to data requests or make available aggregate data on a case-by-case basis when aggregate data is not considered to be commercially sensitive and is not deemed to provide a competitive advantage to any participant.

In accordance with the Tariff and its data retention policies, MISO requires the IMM to periodically destroy information that is no longer necessary to implement the MMM Plan.

11 Consultation, Notification, Posting and Reports

This section summarizes the private contact with, and notification given to MPs when they are affected by Mitigation Measures, notification to FERC, the MMM information that is publicly posted, and the public reports that are issued by the IMM.

11.1 Consultation with MPs

When conduct is identified that is not consistent with competitive behavior, fails a Conduct Test and has a substantial impact on prices or RSG MWPs, the IMM, as soon as practicable and if warranted in light of the information available, contacts the MP to request an explanation of the conduct. Mitigation through the AMP is an example of mitigation events that, by their nature, do not warrant the IMM's prior consultation with the MP. Likewise, if an MP expects to submit Offers that will exceed its conduct thresholds, the MP should contact the IMM in advance of submitting the Offers to provide an explanation of the legitimate basis for its Offers.

If an MP's explanation of the reasons for its Offers indicates to the satisfaction of the IMM that the Conduct is consistent with competitive behavior, the IMM takes no further action.

Upon request, the IMM also consults with an MP about the information and analysis used to determine Reference Levels. If cost data or other information submitted by an MP satisfies the IMM that the Reference Levels for that MP should be changed, revised Reference Levels are determined, communicated to the MP, and implemented as soon as practicable. The IMM will provide an explanation of its determination to the MP upon request.

A Market Participant for a Resource that does not satisfy any of the conditions to be designated an AME Resource as described in Section 39.2.5.b.xxvi of the Tariff, may request consultation with the IMM regarding whether such designation is appropriate.

11.2 Notifications to MPs

MISO notifies individual MPs via the Market Portal or market settlements statements whenever Default Offers, Penalty Charges, Load Measures, Virtual Transaction Measures and other appropriate MMM actions are imposed, as well as in connection with external requests for Confidential Information. The Market Portal notifications are not sent via e-mail, but are available to the MPs via the "Active Messages" area of the MISO Market Portal. A private notification is directed to a specific Market Participant rather than broadcast to all users. A priority is given to notifications when they are posted such that a 0 priority indicates an emergency.

Notifications are also provided to all MPs about changes to the list of data that must be routinely provided.

The following specific notifications are provided to MPs via the MISO Market Portal:

1) **Reference Levels**: The values of Reference Levels used for economic withholding Conduct Testing (i.e., Energy costs, No-Load costs, Start-up costs, Operating Reserve costs, Off-Line Short-Term Reserve costs, Planning Resource costs, time-based parameters and other parameters expressed in units other than time or dollars)
2) **Default Offers**: Under certain conditions (e.g., if Conduct Tests are failed or if Conduct Tests are pending[8]), the Default Offers that would be imposed in the event mitigation is warranted, including Energy, No-Load, Start-Up, Operating Reserve, Off-Line Short-Term Reserve and Planning Resource costs, as well as time-based parameters and other parameters expressed in units other than time or dollars)
3) **Supply Mitigation Notifications**: In the event mitigation is imposed for Offers via AMP, the time period and the Resource being mitigated
4) **Other Notifications**: The IMM may use the Portal XML Specification for Notifications to provide ad hoc notification information whenever warranted, including notifications of the imposition of Load Measures, Virtual Transaction Measures, Offer Verification in conjunction with FERC Order No. 831 and the use of Default Offers to determine RSG MWPs.

Any delay of notifications does not affect the validity of any mitigation that otherwise conforms to applicable Tariff requirements.

11.2.1 Changing the List of Data Routinely Required from MPs

The IMM publishes the list of data that is routinely required from MPs to support MMM activities. Prior to creating this list and prior to adding or deleting any categories of data or information to or from the list, the IMM notifies MPs and other interested parties via normal business communication methods and provides an opportunity for comment. Notification about and comments on the list of required data are transmitted with normal business communication methods.

[8] Default Offers for Real-Time Daily parameters must be submitted before the beginning of the OD and are paired with hourly Energy, Operating Reserve Offers and Off-Line Short-Term Reserve Offers to satisfy database validation rules. Consequently, Default Offers containing daily parameters will be created in advance for certain real-time Generation Offers (i.e., for fast-start units). If no Conduct Test failure has occurred, the advance Default Offers will reproduce the as-bid parameters.

11.2.2 Release of Confidential Information

External requests for Confidential Information are received by the MISO Client Relations Department and are referred to the Legal Department for appropriate action. Confidential Information is treated as described in Section 38.9 of the Tariff ("Confidentiality").

In the following three situations, MISO or the IMM notifies an MP prior to the release of Confidential Information:

1) ***Information Required by FERC or its Staff*** – MISO or the IMM provides the information to FERC or its staff, requesting that the information be treated as confidential and non-public, and be withheld from public disclosure. MISO or the IMM promptly notifies the MP that submitted the requested Confidential Information that a request for disclosure of Confidential Information has been received.
2) ***Information Required by ERO or Any of its Regional Entities or Regional Reliability Councils/Organizations*** – MISO or the IMM determines that this information is required to enhance and/or maintain reliability within the MISO Region and its neighboring Balancing Authority Areas, and ensures that the ERO or its Regional Entities or Regional Reliability Councils/Organizations are bound by a written agreement to maintain the information as confidential. MISO or the IMM notifies the affected MP of its intention to release Confidential Information no less than five business days prior to the release.
3) ***Information Requested by a Third Party in the Course of a Judicial or Administrative Proceeding other than FERC, ERO or its Regional Reliability Councils*** – Prior to disclosing Confidential Information to a third party, MISO or the IMM (or another MP if it holds the information) notifies the affected MP of the request, permitting the affected MP to challenge and defend against the disclosure requirement at its sole discretion and cost.

11.3 IMM Notification to FERC

The IMM provides notification to FERC in the following circumstances:

1) Recommendation for sanction of MP is made to MISO;
2) Changes to Conduct and Impact Thresholds are needed to improve the operation of the MMM Plan;
3) NCAs are designated or changed;
4) Authorizations are requested to impose additional Mitigation Measures for conduct that distorts competitive market outcomes but are not triggered by existing Conduct and Impact Thresholds;

5) Significant market problems are identified that may require further investigation, changes in the Tariff or market rules, or actions by FERC and/or the state regulatory agencies;
6) Important matters need to be brought to the attention of FERC to achieve the purposes, objectives and effective implementation of the MMM Plan;
7) If the IMM has a credible reason to believe a Market Participant is violating market rules or engaging in manipulative conduct to increase RTORSGP or DAMAP; and
8) Any behavior by a DRR that the IMM has reason to believe has violated applicable market rules.

11.4 Posted Information

Information for MPs related to Market Monitoring and Mitigation is posted on the following sites:

1) https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#t=10&p=0&s=&sd=
   The IMM portion of the MISO public web site contains the following information:
   a) The MISO State of the Market Report (from previous years)
   b) The values of BCA CGSFCs (all currently defaulted to +.06 and -.06)
   c) Broad Constrained Area designations and BCA Mitigation (from representative past calendar quarters)
   d) The designation of NCAs and the Generators located in those areas
   e) IMM budget (for current year)
   f) List of real-time Binding Transmission Constraints Representative GSFs
2) The MISO Market Portal (access restricted):
   a) Information concerning the imposition of Default Offers, Penalty Charges, Load Measures and Virtual Transaction Measures
   b) Reference Levels

11.4.1 Designation of Narrow Constrained Areas

To ensure the NCA designations are available to MPs, the NCA designations, the Generators located in those areas, and the associated thresholds for identifying economic withholding for Energy Offers, Minimum Generation Offers, Start-Up Offers, and other bidding parameters are posted on MISO's website.

11.4.2 Designation of Constrained Reserve Zones

To ensure the Constrained Reserve Zone designations are available to MPs, the Constrained Reserve Zone designations, the Generators located in those areas are posted on the MISO Web site. The associated thresholds for identifying economic withholding for Energy Offers, Minimum

Generation Offers, Ancillary Services Offers, Start-Up Offers, and other bidding parameters are posted on the MISO website under NCA and BCA.

11.4.3 Generation Shift Factors and Constraint Generation Shift Factor Cutoff Values

In order to determine whether a Resource has a significant effect on a constrained Flowgate in a BCA, the IMM calculates a GSF for each Resource relative to each potentially constrained Flowgate and the CGSFC value for each Flowgate. A Resource is considered to have a significant effect on the Flowgate if the value of its GSF is outside the range of the corresponding positive and negative CGSFCs for that Flowgate.

The IMM posts all CGSFCs on the MISO website at:
https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=

Currently, default levels of +.06 and –.06 are used as the positive and negative CGSFCs for all Flowgates. If these should change, the new CGSFC values will be posted. Time is allowed for MPs to comment on any proposed changes in CGSFC values before implementing the changes.

To assist the owner of a Resource to understand whether its Resource is located within a BCA for a given Flowgate, the IMM also posts for private access a table of historic GSFs for Resources owned by the authorized MP. The table presents a column of GSFs for each Resource as determined for a comprehensive set of historic constraints. This table is posted on the IMM portion of MISO's website at:
https://www.misoenergy.org/markets-and-operations/independent-market-monitor2/#nt=

11.4.4 Imposition of Default Offers, Load Measures, Virtual Transaction Measures and Penalty Charges

Load Measures may be imposed when the IMM determines that an LSE has been meeting a substantial portion of its Load with purchases in the Real-Time Energy and Operating Reserve Market, that this practice has contributed to an unwarranted divergence of LMP between the Day-Ahead and Real-Time Energy and Operating Reserve Markets, and that this practice has created operational problems. A description of this type of problem is posted on MISO's market portal. Access to the Market Portal is restricted so that only the affected MP can view this information.

11.4.5 Resource Cost Information

Resource cost information is required by the IMM to calculate Reference Levels by the Consultative (Cost-Based) method (see Section 6.9.1). MPs upload and verify their unit data on the IMM's Operating Cost Survey website at:
https://www.potomaceconomics.com/ocs

11.5 Reports

The IMM provides an annual *State of the Market* report discussing the competitive performance and efficiency of each of the MISO Markets, recommendations for improvements in the Markets and/or in the MMM Plan, and a discussion of requests for investigations and complaints and how they were resolved.

11.5.1 State of the Market Report

The IMM issues an annual *State of the Market* report in May of the subsequent year. This report evaluates the status of the Energy and Operating Reserve Markets and other markets administered by MISO, discusses their competitive performance and efficiency, and makes recommendations for improvements to the Energy and Operating Reserve Markets or to the MMM Plan. The following topics are typical for the *State of the Market* report:

1) Market characteristics and operations
2) Wholesale market prices and day-ahead/real-time price convergence
3) Analysis of Energy, Operating Reserve and Short-Term Reserve Offers
4) Changes in Generation Resources, Load and Resource margins
5) Transmission utilization
6) Market concentration
7) Pivotal Supplier analysis
8) Discussion of special situations such as blackouts
9) Discussion of Transmission Loading Relief events and Curtailments
10) Market power mitigation actions, including:
    - The number of Resources and MWh mitigated, reported by location (as appropriate under MISO's information policies)
    - Mitigation by product type, Energy, Operating Reserves or Short-Term Reserves
11) Summary of requests for investigations or complaints, and their resolution
12) Proposed markets (e.g., an Ancillary Services Market) and market rules developments
13) RTO configuration and coordination
14) Economic incentives to invest in new Generation, Transmission and DRRs Type I and Type II in various locations

15) Recommendations for changes in the operation of the markets
16) Recommend changes to Mitigation Measures if inappropriate application of the existing Mitigation Measures resulted in existing Resources or new Resources being unable to operate profitably, or resulted in an understatement of Energy, Operating Reserve or Short-Term Reserve prices during shortage conditions.

The IMM's *State of the Market* report is made public (without revealing Confidential Information), is posted on the MISO website, and is sent to FERC and the state regulatory agencies. MISO responds within 120 days to any recommendations for action in the report, unless a longer period for responding is agreed upon between MISO and the IMM. Recent reports are located at: https://www.misoenergy.org/markets-and-operations/independent-market monitor2/#t=10&p=0&s=&sd=

11.5.2 Other Reports

The MISO Board of Directors, FERC, or a state regulatory agency may request other reports from the IMM and the IMM may also prepare other reports that it considers necessary. The IMM also prepares monthly and quarterly reports which are presented publicly to the Markets Committee of the Board of Directors. These reports are made public with Confidential Information being protected. MISO also responds within 120 days to any recommendations made in these other reports, unless a longer period for responding is agreed upon between MISO and the IMM. The cost of these reports is borne by MISO.

12 Complaints, Investigations and Dispute Resolution

This section briefly explains the mechanisms in place to handle MP complaints and to initiate investigations of problems related to MMM. This section also explains the procedure to resolve disputed Penalty Charges and substitution of Default Offers.

12.1 Complaints and Requests for Investigations

Any MP, FERC, a state regulatory agency, the MISO Board of Directors or other interested entity may, on a confidential basis, submit a complaint to the IMM or a request for the IMM to investigate potential problems (using any standard form of business communication). The IMM also carries out investigations requested by FERC and the state regulatory agencies to the extent deemed necessary and reports the results to the requesting agency, to MISO, and to FERC and other state regulatory agencies as appropriate, while protecting Confidential Information. The IMM decides whether to undertake an investigation requested by an MP or other interested entity and responds as appropriate on a case-by-case basis.

12.2 Dispute Resolution

Whenever an MP has reasonable grounds to dispute a Mitigation Measure, the Dispute Resolution Procedures in Module A, Section 12 of the Tariff provides the primary means to seek redress. Under the Federal Power Act, an MP may also appeal directly to FERC.

12.2.1 Disputed Penalty Charges

An MP may withhold payment of a disputed Penalty Charge pending the conclusion of any dispute resolution proceeding or petition to FERC for review. If a Penalty Charge is withheld and it is subsequently determined that the penalty is valid, the penalty must then be paid with interest at MISO's average cost of borrowing.

If, on the other hand, a Penalty Charge is paid and it is determined that the penalty should not have been imposed, MISO refunds that penalty with interest. This is the MP's only remedy.

Neither the IMM nor MISO may be held liable for monetary damages or any other remedy or relief in connection with Penalty Charges.

12.2.2 Disputed Default Offers

If a Default Offer is substituted for an MP's Offer and, subsequently, it is determined that the Offer should not have been mitigated, MISO will compensate the affected MP for all periods of improper mitigation. Compensation for each MW of the Default Offer will be calculated at the higher of the Market Clearing Price or the full Offer as originally submitted. In addition, if the sum of the

differences between the market clearing prices for the affected periods and the MP's Offer prices is insufficient to permit the MP to recover its Start-Up and No-Load costs, the MP will receive an additional RSG payment to compensate for those costs.

13 Appendix

Attachment A: Reference Level Calculations

Exhibit A-1: Example of Bid-Based Reference Calculation Methodology with Fuel Adjustment

							Reference MW Bins										Reference Accepted Bid Values									
Unit	Date	Hour	Capacity	Fuel Today	Fuel @ Dispatch	MW	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
A	9/1/2005	8	22	10	8.5	18	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82	73.56	83.53	97.24	104.7		
A	9/1/2005	9	22	10	8.5	18	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82	73.56	83.53	97.24	104.7		
A	9/1/2005	10	22	10	8.5	14	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82	73.56	83.53				
A	9/1/2005	11	22	10	8.5	13.5	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82	73.56	83.53				
A	9/1/2005	12	22	10	8.5	10	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82						
A	9/1/2005	13	22	10	8.5	10	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	71.82	71.82	71.82	71.82						
A	9/1/2005	14	22	10	8.5	15	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	94.12	94.12	94.12	94.12	94.12	94.12				
A	9/1/2005	15	22	10	8.25	19	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	96.97	96.97	96.97	96.97	96.97	96.97	101.6	126.9		
A	9/1/2005	16	22	10	8.25	21.75	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	96.97	96.97	96.97	96.97	96.97	96.97	101.6	126.9	135.1	
A	9/1/2005	17	22	10	8.25	22	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	96.97	96.97	96.97	96.97	96.97	96.97	101.6	126.9	135.1	139.4
			=COUNT(R4:R13)									Unit A Accepted Bid Count					10	10	10	10	8	8	5	5	2	1
	Column R		=IF(R14>=5,MIN(AVERAGE(R4:R13),MEDIAN(R4:R13)),"N/A")									Unit A Reference Levels					71.82	71.82	71.82	71.82	83.84	88.82	99.84	118	N/A	N/A
	Equations		=H13									Unit A Reference MW					2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22
B	9/1/2005	8	80	10	8.5	80	8	16	24	32	40	48	56	64	72	80	99.44	99.44	99.44	99.44	99.44	99.44	105.1	115.2	124	124
B	9/1/2005	9	80	10	8.5	80	8	16	24	32	40	48	56	64	72	80	99.44	99.44	99.44	99.44	99.44	99.44	105.1	115.2	124	124
B	9/1/2005	10	80	10	8.5	53.71	8	16	24	32	40	48	56	64	72	80	99.44	99.44	99.44	99.44	99.44	99.44				
B	9/1/2005	11	80	10	8.5	53.5	8	16	24	32	40	48	56	64	72	80	99.44	99.44	99.44	99.44	99.44	99.44				
B	9/1/2005	12	80	10	8.5	64.5	8	16	24	32	40	48	56	64	72	80	97.86	97.86	97.86	97.86	97.86	97.86	108.5	118.4		
B	9/1/2005	13	80	10	8.5	64.75	8	16	24	32	40	48	56	64	72	80	97.86	97.86	97.86	97.86	97.86	97.86	108.5	118.4		
B	9/1/2005	14	80	10	8.5	74	8	16	24	32	40	48	56	64	72	80	97.86	97.86	97.86	97.86	97.86	97.86	108.5	118.4	127.1	
B	9/1/2005	15	80	10	8.25	48	8	16	24	32	40	48	56	64	72	80	96.97	96.97	96.97	96.97	96.97	96.98				
B	9/1/2005	16	80	10	8.25	45.57	8	16	24	32	40	48	56	64	72	80	96.97	96.97	96.97	96.97	96.97					
B	9/1/2005	17	80	10	8.25	64	8	16	24	32	40	48	56	64	72	80	96.97	96.97	96.97	96.97	96.97	96.98	109.2	119.9		
			=COUNT(R18:R27)									Unit B Accepted Bid Count					10	10	10	10	10	9	6	6	3	2
	Column R		=IF(R28>=5,MIN(AVERAGE(R18:R27),MEDIAN(R18:R27)),"N/A")									Unit B Reference Levels*					97.86	97.86	97.86	97.86	97.86	97.86	107.5	117.6	N/A	N/A
	Equations		=H27									Unit B Reference MW					8	16	24	32	40	48	56	64	72	80

* This example uses six as the minimum bid count for a reference level to be valid, but six is not necessarily used in practice.

Exhibit A-2: Example of LMP-Based Reference Calculation Methodology with Fuel Adjustment

								Reference MW Bins										Reference Accepted LMP Values									
Unit	Date	Hour	Capacity	Fuel Today	Fuel @ Dispatch	LMP	MW	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
A	9/1/2005	8	22	10	8.5	104.8	18	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3
A	9/1/2005	9	22	10	8.5	110.75	18	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	130.3	130.3	130.3	130.3	130.3	130.3	130.3	130.3		
A	9/1/2005	10	22	10	8.5	74	14	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	87.06	87.06	87.06	87.06	87.06	87.06				
A	9/1/2005	11	22	10	8.5	66.25	13.5	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	77.94	77.94	77.94	77.94	77.94	77.94				
A	9/1/2005	12	22	10	8.5	45	10	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	52.94	52.94	52.94	52.94						
A	9/1/2005	13	22	10	8.5	43.38	10	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	51.04	51.04	51.04	51.04						
A	9/1/2005	14	22	10	8.5	45.25	15	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	53.24	53.24	53.24	53.24	53.24	53.24				
A	9/1/2005	15	22	10	8.25	110	19	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	133.3	133.3	133.3	133.3	133.3	133.3	133.3	133.3		
A	9/1/2005	16	22	10	8.25	130.75	21.8	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	
A	9/1/2005	17	22	10	8.25	120	22	2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22	145.5	145.5	145.5	145.5	145.5	145.5	145.5	145.5	145.5	145.5
			=SUM(IF((S4:S13<=S15)*(S4:S13<>""),1))										Unit A Accepted LMP Count					3	3	3	3	2	2	2	2	1	1
	Column S		=QUARTILE(S4:S13,1)										Unit A Q25 LMP					59.41	59.41	59.41	59.41	84.78	84.78	130.3	130.3	134.4	128.8
	Equations		=IF(S14>=2,AVERAGE(IF((S4:S13<=S15)*(S4:S13<>""),S4:S13)),"N/A")										Unit A Reference Levels					52.4	52.4	52.4	52.4	65.59	65.59	126.8	126.8	N/A	N/A
			=I13										Unit A Reference MW					2.2	4.4	6.6	8.8	11	13.2	15.4	17.6	19.8	22
B	9/1/2005	8	80	10	8.5	138	80	8	16	24	32	40	48	56	64	72	80	162.4	162.4	162.4	162.4	162.4	162.4	162.4	162.4	162.4	162.4
B	9/1/2005	9	80	10	8.5	154.54	80	8	16	24	32	40	48	56	64	72	80	181.8	181.8	181.8	181.8	181.8	181.8	181.8	181.8	181.8	181.8
B	9/1/2005	10	80	10	8.5	87.21	53.7	8	16	24	32	40	48	56	64	72	80	102.6	102.6	102.6	102.6	102.6	102.6				
B	9/1/2005	11	80	10	8.5	86.85	53.5	8	16	24	32	40	48	56	64	72	80	102.2	102.2	102.2	102.2	102.2	102.2				
B	9/1/2005	12	80	10	8.5	102.48	64.5	8	16	24	32	40	48	56	64	72	80	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6		
B	9/1/2005	13	80	10	8.5	107.74	64.8	8	16	24	32	40	48	56	64	72	80	126.8	126.8	126.8	126.8	126.8	126.8	126.8	126.8		
B	9/1/2005	14	80	10	8.5	88.75	74	8	16	24	32	40	48	56	64	72	80	104.4	104.4	104.4	104.4	104.4	104.4	104.4	104.4	104.4	
B	9/1/2005	15	80	10	8.25	85.02	48	8	16	24	32	40	48	56	64	72	80	103.1	103.1	103.1	103.1	103.1	103.1				
B	9/1/2005	16	80	10	8.25	77.12	45.6	8	16	24	32	40	48	56	64	72	80	93.48	93.48	93.48	93.48	93.48					
B	9/1/2005	17	80	10	8.25	82.58	64	8	16	24	32	40	48	56	64	72	80	100.1	100.1	100.1	100.1	100.1	100.1	100.1	100.1		
			=SUM(IF((S18:S27<=S29)*(S18:S27<>""),1))										Unit B Accepted LMP Count					3	3	3	3	3	3	2	2	1	1
	Column S		=QUARTILE(S18:S27,1)										Unit B Q25 LMP					102.3	102.3	102.3	102.3	102.3	102.6	108.5	108.5	133.4	167.2
	Equations		=IF(S28>=2,AVERAGE(IF((S18:S27<=S29)*(S18:S27<>""),S18:S27)),"N/A"										Unit B Reference Levels					98.58	98.58	98.58	98.58	98.58	101.6	102.3	102.3	N/A	N/A
			=I27										Unit B Reference MW					8	16	24	32	40	48	56	64	72	80

* This example uses two as the minimum bottom quartile LMP count for a valid reference level, but two not necessarily used in practice.