



1 Purpose

This document describes the terms and methodologies used in the calculation of Capacity Benefit Margin (CBM). The document describes the following:

- The Methodology for Calculation of CBM
- How CBM is allocated on Flowgates
- The Conditions for the Use of CBM

2 Scope

The scope of the Capacity Benefit Margin Implementation Document covers the process used for calculating the Capacity Benefit Margin (CBM), as well as the method and conditions for the use of the CBM.

3 Definitions

Capitalized terms herein shall have the meaning provided in the [MISO Tariff](#), the NERC Reliability Standards ([NERC Standards](#)), the NERC Glossary of Terms Used in Reliability Standards ([NERC Glossary](#)), or as defined by this document.

- Automatic Reserve Sharing (ARS): One component of the Transmission Reliability Margin attribute for a Flowgate owned by the Transmission Service Provider (TSP). ARS provides reasonable assurance that transmission capacity will be available to accommodate generation reserve sharing upon notification of a reserve sharing event.
- Available Flowgate Capability (AFC): A measure of the flow capability remaining on a Flowgate for further commercial activity over and above already committed uses. It is defined as Total Flowgate Capability (TFC), less Existing Transmission Commitments (ETC), less a Capacity Benefit Margin, less a Transmission Reliability Margin, plus Postbacks and counterflows. AFC values are time and service type dependent. MISO calculates Firm and Non-Firm AFC values for 36 months into the future from the next hour.
- Capacity Benefit Margin (CBM): The amount of firm transmission transfer capability preserved by the Transmission Provider for Load-Serving Entities whose loads are located on that Transmission Service Provider's (TSP's) system, to enable access by the Load Serving Entities (LSEs) to generation from interconnected systems to meet generation reliability requirement. Preservation of CBM for an LSE allows that entity to reduce its installed generating capacity below that which may otherwise have been necessary without interconnections to meet its generation reliability requirements. The transmission transfer capability preserved as CBM is intended to be used by the LSE only in times of emergency generation deficiencies.



- Generation Capability Import Requirement (GCIR): The amount of generation capability from sources external to a CBM study zone identified by MISO, a Load Serving Entity (LSE), or a Resource Planner (RP) to meet its generation reliability or resource adequacy requirements as an alternative to internal resources.
GCIR = Planning Reserve Requirement (Calculated with LOLE Probabilities) - Internal Sources - Contracted Externals
- Local Balancing Authority (LBA): An operational entity or a Joint Registration Organization which is (i) responsible for compliance to NERC for the subset of NERC Balancing Authority Reliability Standards defined in the Balancing Authority Agreement for their local area within the MISO Balancing Authority Area, (ii) a Party to Balancing Authority Agreement, excluding MISO, and (iii) shown in Appendix A to the Balancing Authority Agreement.
- Transmission Reliability Margin (TRM): The amount of transmission transfer capability necessary to provide reasonable assurance that the interconnected transmission network will be secure. TRM accounts for the inherent uncertainty in system conditions and the need for operating flexibility to ensure reliable system operations as system conditions change.

4 Roles and Responsibilities

- Load Serving Entities and Resource Planners: Are responsible for requesting additional CBM to be set aside.
- MISO Planning Engineers: Are responsible for providing Generation Capability Import Requirement (GCIR) value for CBM calculation.
- MISO Seams Engineers: Are responsible for calculating CBM values for MISO-owned flowgates using the methodology described in this document.

5 CBM Methodology Description

5.1 Introduction

MISO uses the Flowgate methodology to calculate AFC values and evaluate transmission service requests (TSRs). CBM values are calculated (in MWs) for each Flowgate which AFC values are calculated and are decremented from the TFC used for firm AFC calculations across all horizons.¹ The firm AFC calculations for flowgates are calculated as described in the Transmission Provider's Available Transfer Capability Implementation Document (ATCID).

MISO will only preserve CBM on Flowgates to the extent it is needed to provide emergency support to firm load within MISO. MISO has defined a study process that is

¹ References retired NERC Standard MOD-004-1 R1. MISO will continue to perform this service for its members under NAESB standard WEQ-023-1.5.



used to determine the amount of CBM needed on Flowgates, which is independent of the process that will be followed to utilize CBM. CBM held as a result of MISO's study process becomes available for any load within the MISO market that is experiencing a generation deficiency. The utilization of CBM is not restricted to the situations studied that resulted in the preservation of CBM.

A Loss of Load Expectation (LOLE) method that is consistent with the Resource Adequacy construct in Module E of the MISO Tariff is used to provide a determination of GCIR for CBM study zones no smaller than a LBA within MISO.

Data Requests – MISO will provide clarification of its TTC/TFC methodology, ATCID, CBMID or TRMID, to any registered entity that demonstrates a reliability need within forty-five calendar days of receiving a request or on the schedule as specified by the requestor.² If the request for clarification is contrary to MISO's confidentiality, regulatory or security requirements, a written response will be provided explaining on what basis the clarification could not be provided and whether there are any options for resolving the confidentiality, regulatory or security concerns.

5.2 Calculation and Allocation of CBM Values

CBM values for each Flowgate will be established through the following study and assignment process.

5.2.1 Requested CBM 'Set Aside'

MISO calculates CBM for the Load Serving Entities and Resource Planners within the MISO energy market. However, these Load Serving Entities or Resource Planners have the option to perform the studies necessary to request additional CBM to be set aside.³

Requests for additional CBM shall be accommodated by a GCIR study according to NERC standard MOD-004. When requesting that additional CBM be set aside to meet their GCIR, an LSE or Resource Planner can also select different source regions if there is a reason to believe these regions would be better suited to meet their GCIR.

To submit an established CBM value or to request additional CBM set aside, an LSE or Resource Planner shall submit a CBM Set Aside Request to MISO⁴. The request must

² References retired CFR00132, NERC Standard MOD-008-1 R3. MISO will continue to perform this service for its members under NAESB standard WEQ-023-1.7.

³ References retired CFR00001, NERC Standard MOD-004-1 R10. MISO will continue to perform this service for its members under NAESB standard WEQ-023-3.1.

⁴ The request Form is provided as Appendix 1 to this CBMID.



be received by MISO by February 1st to be considered in the Spring CBM Update and by August 1st for the Fall CBM Update.

5.2.2 CBM Analysis and LOLE Study

MISO will perform a CBM LOLE study to determine the GCIR of each CBM study area. CBM study areas are composed of one or more LBAs until the entire MISO market footprint is divided into study areas. The LOLE study is performed based on these study areas, which are determined by the LOLE Working Group (LOLEWG) and updated as necessary.

The LOLE study will be performed using the same data sources which been used to perform the Module E LOLE study. GCIR will be adjusted based on CBM Set Aside Requests as discussed above.

The next step in determining the CBM for each Flowgate is to perform a power transfer analysis for each study area that has an import requirement (positive GCIR) to meet its LOLE requirement. The ARS component of TRM includes a margin for the complete loss of a single generator within the MISO contingency reserve group with reserve sharing activated for the replacement of the lost resource⁵. Accordingly, to identify CBM, all units in each specified study area are included as sink points because any unit may participate in the area generation deficiency, and all units in the study area will be reduced in proportion to their capacity, including nuclear units. The expected source regions for each study area are adjacent study areas, including Balancing Authorities external to the MISO footprint. Additional outside support scenarios will also be studied when requested, as described above. If a generator was used as a resource that is not located within the MISO market, the LSE utilizing this resource might need transmission service from MISO and other transmission providers to move emergency support from the source to the LBA where the load is located. The arrangements for the use of the transmission systems of other transmission providers in such cases are made by the involved LSE, not by MISO.

Each study area's power transfer impacts each Flowgate on the Transmission System to a certain degree, as determined by the corresponding distribution factor. The largest incremental impact on a Flowgate from these transfers becomes the initial CBM for this Flowgate. Moreover, since the ARS component of TRM is maintained for the loss of a single generator and CBM is preserved for the concurrent loss of multiple generators, there exists the possibility of a double- counting reliability margin for the loss of the same generation. To ensure no double-counting issues arise under these

⁵ The loss of resources will be expanded beyond the MISO market to the extent MISO has agreements with other transmission providers.



circumstances, MISO compares the original Flowgate CBM calculated above to the ARS component of TRM for that same Flowgate. If the ARS component is greater than the CBM value determined through power transfer simulation, no CBM will be preserved on that Flowgate. If the ARS component is less than the CBM value determined through power transfer simulation, the incremental amount of CBM that is needed above the ARS component will be preserved as the CBM on that Flowgate. Accordingly, only the incremental amount of CBM that is needed in addition to the ARS component of TRM will be preserved on Flowgates within the MISO Transmission System and becomes the value for the CBM attribute for the Flowgate.

5.2.3 Flowgate CBM Assignment

Discrete CBM values will be determined for summer and winter seasons; however, the same CBM value of each Flowgate is used for the same season in all AFC/ATC calculation years, i.e., only one summer CBM value and one winter CBM value for each Flowgate. The switch days of the two values are April 15th and October 15th.

5.2.4 CBM Update Schedule

CBM updates are performed at a minimum of twice per calendar year. Please note that actual CBM values may remain unchanged even after an update has been performed if the supporting input data remains unchanged. Additional updates may be performed when necessary, including but not limited to Transmission Owner membership change.

5.2.4.1 CBM Value and Update Availability

MISO will notify Transmission Operators, Transmission Service Providers, Reliability Coordinators, Transmission Planners, Resource Planners, and Planning Coordinators that are within or adjacent to MISO and to the Load Serving Entities and Local Balancing Authorities within the MISO market footprint, any updates to this document.⁶

MISO will notify all Load-Serving Entities and Resource Planners within its market footprint (or those acting on their behalf) who requested a specific CBM value of the results of the CBM study within 31 days from the time the values are updated.

5.3 Utilization of CBM

MISO operates as a single Balancing Authority Area. It performs centralized security constrained unit commitment and generation dispatch to serve its entire load. An

⁶ References retired NERC Standard MOD-004-1 R1. MISO will continue to perform this service for its members under NAESB standard WEQ-023-1.5.



individual LSE would not request the use of CBM since there will not be a single LSE considered deficient during capacity emergencies. As per section 40.2.20 of the MISO Open Access Transmission, Energy, and Operating Reserve Markets Tariff, “Load Shedding will be implemented on a MISO Balancing Authority Area basis, or on a Sub-Area basis if limited by transmission constraints, as required to restore Energy balance.”⁷

MISO will utilize CBM only when experiencing a declared NERC Energy Emergency Alert (EEA) 2 or higher, as outlined in The MISO Market Footprint and Sub-area Capacity Emergencies Procedure. The MISO Reliability Coordinator may utilize CBM by elevating the priority level of an existing Interchange Transaction from Priority 6 to Priority 7 to maintain the transaction per NERC EOP 011-1. If a Transmission Constraint still exists (not enough CBM available), this transaction will be curtailed in the same manner as other firm transactions. The MISO Balancing Authority also has agreements with neighboring Balancing Authorities to import additional energy during such emergencies, as outlined in individual Balancing Authority agreements.

6 References

- MISO Tariff, Module A
- MISO Tariff, Module C, Section 40.2.20
- NERC EOP-011-1 Emergency Operations

7 Disclaimer

The provisions of the Tariff and the services provided thereunder. MISO may revise or terminate this document at any time at its discretion without notice. While every effort will be made by MISO to update this document and inform its users of changes as soon as practicable, it is the responsibility of the user to ensure use of the most recent version of this document in conjunction with the Tariff and other applicable documents, including, but not limited to, the applicable NERC Standards. Nothing in this document shall be interpreted to contradict, amend, or supersede the Tariff. MISO is not responsible for any reliance on this document by others, or for any errors or omissions or misleading information contained herein. In the event of a conflict between this document, including any definitions, and either the Tariff, NERC Standards, or NERC Glossary, the Tariff, NERC Standards, or NERC Glossary shall prevail. In the event of a conflict between the Tariff and the NERC Standards, or NERC Glossary, the Tariff shall prevail until or unless the Federal Energy Regulatory Commission (FERC) orders

⁷ References retired CFR00001, NERC Standard MOD-004-1 R10. MISO will continue to perform this service for its members under NAESB standard WEQ-023-3.3.



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otherwise. Any perceived conflicts or questions should be directed to the Legal Department.

8 Revision History

Doc Number	Description	Revised by:	Effective Date
TP-PL-003-r16	Conversion from NERC MOD standards to NAESB WEQ standards	A. Klueber	Jan-27-2023
TP-PL-003-r15	Annual Review completed. Added acronym definition for TSP and TFC in section 3. Updated MISO Resource Forecasting Engineers to MISO Planning Engineers in section 4. Updated MISO Seams Administration Engineers to MISO Seams Engineers in section 4.	A. Klueber	Mar-11-2022
TP-PL-003-r14	Annual Review completed. Deleted retired reference EOP-001-2.	S. Guo	Mar-14-2021
TP-PL-003-r13	Annual Review completed; Review completed on the LBA changes of GridLiance	S. Guo	Mar-14-2020
TP-PL-003-r12	Update the language in section 5.2.2. to clarify the process of final CBM value establishment. Annual Review completed.	S. Guo	SEP-10-2019
TP-PL-003-r11	Replaced retired reference NERC Standard EOP-002-3.1 with the replacement EOP—011-1. Annual Review completed	S. Guo K. Thomas	SEP-10-2018
TP-PL-003-r10	Annual Review completed	S. Guo	SEP-30-2017
TP-PL-003-r9	Annual Review completed	S. Guo	SEPT-30-2016
TP-PL-003-r8	Annual Review completed	K. Thomas S Guo	OCT-06-2015
TP-PL-003-r7	Update and verify all definitions and references. Complete Annual Review	K. Thomas	OCT-06-2014
TP-PL-003-r6	Complete Annual Review	K. Thomas J. Li	JUL-26-2014
TP-PL-003-r5	Annual Review completed. Due to manual error in revision numbering, 'a', 'b', 'c' and 'd' were added to distinguish versions of revision 2 and corrected Revision History to display complete history.	T. Nguyen J. Li	JUL-26-2013
TP-PL-003-r4	Complete Annual Review	J. Harmon	JUL-28-2012
TP-PL-003-r2d	MISO Rebranding Changes	G. Krebsbach	JUL-12-2011



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TP-PL-003-r2c	Revision to comply with NERC Standard MOD-004-1.	J. Harmon	APR-01-2011
TP-PL-003-r2b	Complete Annual Review 10-6-2010	C. Risley	OCT-06-2009
TP-PL-003-r2a	Complete Annual Review 10-6-2009	J. Harmon	OCT-06-2009
TP-PL-003-r1	Changed CBM calculation responsible party	J. Harmon	JAN-30-2009
TP-PL-003	Original	J. Harmon	JUL-31-2008



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Appendix 1 to Capacity Benefit Margin Implementation Document

1. The undersigned Load Serving Entity or Resource Planner, Located in ____ Local Balancing Authority, submits this request to preserve CBM on the MISO transmission system for Capacity Emergency events.
2. The requested Generation Capability Import Requirement (GCIR) into its Local Balancing Authority from Balancing Authorities outside of the MISO market is:
____ MW for winter season
____ MW for summer season
3. Please provide the source and the import MW value (summer and winter) from each external Balancing Authority:
4. Please provide studies supporting the requested GCIR in Attachment A to Appendix 1
5. Request deadline: This request must be received by MISO by February 1st to be considered in Spring CBM Update and by August 1st for Fall CBM Update.
6. This CBM Set Aside Request shall be submitted to the representative indicated below:

USPS mailing address:

MISO
Attn: Director, Transmission Utilization
P.O. Box 4202
Carmel, IN 46082-4202

For overnight deliveries:



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MISO

Attn: Director, Transmission Utilization

720 City Center Drive

Carmel, IN 46032

7. Representative of the Load Serving Entity or Resource Planner to contact:

8. This CBM Set Aside Request is submitted by:

By (signature): _____

Name (type or print): _____

Title: _____

Date: _____



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Attachment A to Appendix 1

Generation Capability Import Requirement study that comply with NERC standard MOD-004-1 is attached.