



Interconnection Process Working Group (IPWG)

Conference Call & Webex

August 8, 2023

10:00 am to 12:45 pm ET / 9:00 to 11:45 am CT

Dial in and Webex information available at www.misoenergy.org

Minutes

1. Administrative Items (D. Mindham)

a. Welcome and Roll Call

The meeting was called to order at 10:00am ET/9:00am CT.

Chair: David Mindham

Vice Chair: Angela Maiko (absent)

MISO Liaison: Ryan Westphal

Stakeholder Relations: Mandi McGirr

Participants:

A Karmakar, EE Plus
Aaron Demuth, OTP
Aaron Greenberg,
Oriden Power
Aaron Martin, CMS
Aaron Stoll, Plus
Power
Abhilash Muthumani,
Tenaska
Abhishek Dinakar,
Savion
Adam Renfandt,
NDSG
Adam Solomon,
Steelhead/Vestas
Ahmed Salloum, Swift
Current
Ajinkya Rohankar,
BayWa RE
Alan C, Triple Oak
Alan Neal,
Cooperative Energy
Alan Urban, MISO
Alex Huţan, AES
Alex Kloiber, CIPCO
Alex Penney, Duke
Amanda Fong, MISO
Amanda Jones, MISO
Amber Joyce, MDU
Amin Abedi, EPE
Consulting
Andrew Grieve, PG
Renewables
Andrew Kienitz, MN
Power
Andrew Redding,
Heelstone Energy
Andy Cotter, ATC

Andy Kowalczyk,
Senenergy Solutions
Andy Witmeier, MISO
Aneta Godbole, MISO
Anita C, ACES
Ankit Pahwa,
Anne Giett, Burns &
McDonnell
Anteneh Workneh,
GDS
Anthony A Alvarez, IA
OCA
Anusha Papasani,
Hectate Energy
Apoorva Bansal, Next
Era
April Phelps, Entergy
Ash Panegal, Plus
Power
Austin Brier, Urban
Grid Co
Bakhtawar Khan,
Gabel
Ben Dayman, MEC
Ben Kaldunski, NSPW
Ben Scott, CMS
Bert Finzer, MISO
Bil Donmez, Long
Road Energy
Bill Booth, Michael
Best
Bill Turnbull, MEC
Brad Pierson, Walden
Renewables
Brad Wentz, Ameren
Brent Taylor, MPPA
Brian Giggee, MDU
Bridget A Sparks, AES
Brinda Malladi, Arevon

Brock Ondayko,
AEPES
Bruce Froyum, MISO
Caleb Gemperlein,
Heelstone Energy
Carolyn Wetterlin, Xcel
Carrie Rowland, Scout
Clean Energy
Chad Craven, Savion
Chandana
Bommareddy,
Charles Daniel, EPE
Consulting
Chase Lakowske, DPC
Chengyue Guo, ATC
Cho Wang, AES
Chris Gordon, BayWa
RE
Chris Koty, Ameren
Chris Mertz, Candela
Renewables
Chris Plante, WEC
Chris Stolz, PG
Renewables
Christopher Elie, Duke
Christos Ghionis,
Terna Energy
Cindy Guillot, Cleco
Clark Wallace,
Clayton W. Robinson,
Cordelio
Cody Anderson, OTP
Craig Turner, Dakota
Electric
Cy McNeill, Alliant
D Herrman, Solea
Energy
Dakota Parish,
Husch Blackwell



Dan Alfred, CMS
 Dan Barr, ITC
 Dan Stroh, Ameren
 Daniel Fonseca, 1898 & Co
 Daniel Wang,
 Darius Monson, MISO
 Darrell Newcomer, CMS
 Darrin Lahr, MISO
 David Davis, Apex
 David Harlan, Veriquist
 David Johnston, IN URC
 David Leventhal, AES
 David M, CMPAS
 David Osterkamp, ITC
 David Savage, DOE/IURC
 David Ticknor, RES Group
 David Webb, Entergy
 Dean Pawlowski, OTP
 Dennis Corn,
 Derek Kou, EDP
 Derek Snyder, OTP
 Derek Sunderman, Savion
 DeWayne Todd, Alcoa
 Dinemayer Silva, Next Era
 Donovan McGoldrick,
 Husch Blackwell
 Ed Achaab, AEP
 Elijah Feuerhelm , MEC
 Emma Nix, Leeward
 Eric Thoms, Invenergy
 Erik Winsand, ATC
 Erin Murphy, Big Rivers
 Erin Peddicord, MISO
 Ethan Tellier, CIPCO
 Farah Neha, AdvantageCap
 Fei Fan, Recurrent
 Forrest Tingo, Light Source BP
 Forrest Ward, PGR
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 Gertrude Rivera, Entergy
 Ginger Hodge, CES
 Haley McElyea, 1898 & Co
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 Jacob Lampi, CIPCO
 Jake Weinberg, Gabel
 Jamal Khudai, ATC
 James Alexander Witter, Entergy
 Jared Brown, Earth Rise Energy
 Jared Vochoska, EPE Consulting
 Jason Goar, Cooperative Energy
 Jason Hastings, Vesper
 Jeff Chang, Urban Grid Co
 Jeff Gindling, Duke
 Jeremi Wofford, Ameren
 Jeremy Barlow, MPUS
 Jeremy Jones, Entergy
 Jess Kiddoo, Xcel
 Jess Miralda, New Leaf
 Jessica Banike, WEC
 Jessica Willey, Xcel
 Jim Kilgore, MISO
 Jim Waight, Siemens
 Jingyu Sullins, Ameren
 Joe Cottle, Novis
 John Wachtler, MN PUC
 John Wilson, Energy RE
 Jon Langford, Orsted
 Jorge Martin, Abei Energy
 Josh Seibert, Ameren
 Josh Tellier, ATC
 Justin Salinas, ENEL
 Justin Stewart, Ameren
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 Karthik Mekala, RWEA

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 Kathryn Dial, Next Era
 Kathy Estrada, GDS
 Keith Cargill, AES
 Ken Gavin, DTE
 Ken Kagy, CFU
 Kenisha Webber, Entergy
 Kimberly Dunning, CenterPoint
 Konstantin Korolyov, DTE
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 Kurt Vanderlick, Cleco
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 Kyle Talghader, MISO
 Kyle Trotter, MISO
 Kyle Watson, Entergy
 LaShel Marvig, Excel
 Liang Qi, MISO
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 Lisa Silverwulf, HDRC
 Lisa Szot, Strata Clean Energy
 Liv Crowell, Ameren
 Luke Reynolds, Energy RE
 Madeleine Balchan, Xcel
 Madison Pitts, MISO
 Maggie McKenna,
 Maire Waight, MISO
 Margaret Miller, Engie
 Margarita Patria,
 Marlene Parsley, Big Rivers
 Marshall Courtney, PGR
 Maryclaire Peterson, Entergy
 Massamba Samb, Bright Night Power
 Matt Stobb, AES
 Matt Waldron, ATC
 Max Reitz, Ameren
 Steve Dowll, Alcoa
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 Megan Pamperin, MISO
 Meghan Castellano, Connect Gen LLC
 Michael Abettan, InnerGex
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 Michaela Flagg, CES
 Mike Dantzler, Ranger Power
 Mike Fischette, LBWL
 Mike Gahimer, Arevon
 Mike Green, GRE
 Mike Johnson, Oriden Power



Mike Mooney, HEPN
Miles Larson, LSBP
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Nicholas Ford, Hexagon
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Noel Darce, Stone Pigman
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Peg Abbadini, HE
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Ryan Wernette, WPSCI
Rylan Hanson, OTP
Sam Gornberg, UCS USA
Sam Hipple, MISO
Sandeep Tadepally, MISO
Sarah Nieman, MISO
Scott Jones, IN OUCC
Scott Novack, Foundation Solar Partners
Scott Wibbenmeyer, AMeren
Shailabh Mazari, Avangrid
Shane, Foundation Solar Partners
Shaun Murphy, Urban Grid Co
Shawn Welch, Doral
Shirley Schultz, AMP
Shirsha Nandy, Hectate Energy
Simon Cherucheril, PGR
Sing Tay, AES
Sirisha Tanneeru, ICF
Sky Goliber, Galehead Dev
Sophia Dossin, Invenergy
Srijan Karim, MEC
Srinivasa N, ICF
Steve Coleman, Steve Leovy, WPPI
Steve Winsett, Entergy
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Sudipto Bhowmik, IBV Energy
Sumit Brar, MISO
Susan Rossi, Xcel

Sydney Yeadon, MISO
Tag Short, MISO
Terry Jarrett, MJMEUC
Terry Volkmann
Thomas Chamberlain, Entergy
Thomas McNailen, CC Renew
Thompson Adu, Engie
Tia Elliott, Cleco
Tommy Roberts, HEPN
Trevor Andersen, MISO
Trey Mayeux, Cleco
Tung Nguyen, Next Era
Vanessa Ramirez, Belltown Power
Venkat Nagulapally, Vistra
Venkata Bujimalla, IA IUB
Vince Vandaveer, AMeren
Warren Hess, CMPAS
Weiqing Jiang, Jupiter Power
Wendy Anderson, MN Power
Wendy Reed, Wright and Tallisman
Werner Roth, PUCT
Wes Pfaff, MRES
Will Buchanan, Next Era
Yaming Zhu, Siemens
Yarrow Etheredge, Entergy
Yifan Li, Strata Clean Energy
Yonas Demissie, MISO
Yoon Sung Kim, Alliant
Yulin Liang, Cooperative Energy
Yuri Smolanitsky, Arevon
Zachary Callen, ICC

b. Review Agenda

The agenda was accepted as posted.

➡ Post Only

✓ Potential Voting Item

^ Feedback Request

* Verbal Report



c. Review Meeting Minutes / Action Items

The minutes were accepted as posted.

Action Item	Owner	Date	Status
MISO requests feedback on Proposed IBR Performance Requirements by July 14, 2023.	Stakeholder Relations	06/20/2023	Closed
Management Plan <ul style="list-style-type: none"> Replacement Request Proposed Tariff Changes – add to August 	Stakeholder Relations	06/20/2023	Closed

d. Review Management Plan

The management plan was reviewed.

2. Liaison Report (R. Westphal)

- MISO Feedback Responses
 - [IPWG: Proposed IBR Performance Requirements \(20230620\)](#) – MISO shared additional information on Original Equipment Manufacturer (OEM) readiness, continued the discussion on MISO's proposed implementation plan for DPP-2022 Cycle, and requested stakeholder feedback on the Reference Point of Reliability (RPA) at Point of Interconnection (POI) proposal at the August IPWG Meeting. Contact: Patrick Dalton
- GIAA Phase 2 Update – First round of enhancements deployed on July 21, 2023, and additional updates are expected by end of 2023. Contact: Aneta Godbole
- Upcoming Events:
 - MTEP Planning Portal Workshop – August 18
 - System Reliability Attributes Analysis and Roadmap Workshop – September 21
 - Long Range Transmission Planning (LRTP) Workshop - August 31
 - September BOD & AC Registration – Registration and hotel information are now available on the MISO website. Hotel reservation deadline is extended to August 18.

3. MISO Posted Items ➡ (R. Westphal)

a. FERC Status Report

b. Definitive Planning Phase (DPP) Study Cycle Update

4. FERC Interconnection Notice of Proposed Rulemaking (NOPR) (C. Supino)

Review FERC final rule

MISO provided an initial high-level overview of FERC's recently issued [Order No. 2023](#). FERC released Order 2023 on July 28, 2023. The vast majority of adopted reforms initially appear to generally align with current MISO processes, but with numerous differences. MISO is still reviewing the 1,500 pages order to determine how to respond to these directives. The Compliance Filing is due 90 days after publication in the Federal Register. MISO comments can be found in the Improvements to Generator Interconnection Procedures and Agreements NOPR ([RM22-14-000](#)).

MISO explained that the purpose of Order 2023 is to address interconnection queue backlogs, improve certainty, and prevent undue discrimination for new technologies. MISO walked through the adopted reforms, which information access and cluster studies, allocating study cluster costs, financial commitments and commercial readiness, reasonable efforts and penalties, affected systems and optional study, flexibility and incorporating technological advancements, incorporating alternative transmission technologies, and modeling voltage and ride through requirements for nonsynchronous generators.

➡ Post Only

√ Potential Voting Item

^ Feedback Request

* Verbal Report



Regarding cluster studies, MISO intends to maintain 3-phase process and seek independent entity variations as needed. Relating to commercial readiness, the rule requires Interconnection Customers (ICs) to face increasing penalties for withdrawal based on study costs or Network Upgrade estimated costs depending on time of withdrawal. Order 2023 eliminated the Reasonable Efforts standard for study deadlines and added a penalty structure for failure to meet deadlines. MISO is in progress of working through what implementation of this change will look like.

Order 2023 included a requirement that transmission providers use Energy Resource Interconnection Service (ERIS) modelling standards when studying affected systems interconnection requests. MISO will require a valid EMT model upfront. MISO uses fuel-based dispatch assumptions, rendering the requirement of evaluation of generating facility additions inapplicable. Order 2023 declined to require annual reports on the list of alternative technologies considered. MISO already considers a lot of these alternatives to building new transmission and will work with Transmission Owners (TOs) for viable mitigation. The group also discussed demonstration of variations and reimbursement.

Next Steps for MISO include the following:

- Review the order in detail to determine what is needed for compliance and where independent entity variations are needed.
- Determine impact of Order 2023 compliance on other queue improvement efforts.
- Evaluate whether any clarifications, rehearing requests, or extensions are warranted.
- Current Compliance Filing deadline is early November 2023.

5. Replacement Request Proposed Tariff Changes (H. Zhang)

Discuss further Tariff and BPM-015 Clarifications

MISO provided additional information on the Generator Replacement Process improvements as requested in June IPWG. MISO highlighted the key submission timeline requirements for generator replacement requests, provided timeline charts for different scenarios, and clarified the replacement request submission process for units that share Generator Interconnection Agreements (GIAs) with other units. The proposed Tariff language (Attachment X, Appendix 1 and Module C section 38.2.7) will be provided at the August 30, 2023, Planning Advisory Committee (PAC) and stakeholder feedback will be requested. MISO anticipates the Tariff filing to occur in Q4 of 2023.

The generator replacement requests timing requirements include a maximum of thirty-six (36) cumulative months during any five (5) year period under any combination of suspended and SSR-designated statuses. MISO emphasized that if there are material adverse impacts or reliability concerns, then the Interconnection Customer (IC) will need to go through the 3-phase DPP process for the replacement unit and Attachment Y process for the existing unit, or the IC can withdraw the replacement request. The group discussed requests to split Grandfather Arrangements (GFAs). MISO clarified that based on existing (and original) Tariff provisions, if a generator is not being fully replaced then the remaining portion must retire.



6. FAC-002-4 (Facility Interconnection Studies)^ (M. Waight/R. Westphal)

Discuss implementation plan

MISO reviewed BPM-015 and Tariff redlines for the NERC FAC-002-4 revision. MISO explained the purpose of the FAC-002 standards is to study the impact of interconnecting new or changed facilities on the Bulk Electric System (BES). The changes to FAC-002-4 include the new term Qualified Change (to replace material modification to avoid confusion) and the new R6 requirement for the Planning Coordinator to publicly define Qualified Change. BPM-015 section 6.7 redlines and Tariff redlines (Attachment X: Appendix 1 and GIP) reflecting the new Qualified Change term are posted with meeting IPWG materials. The Planning Subcommittee (PSC) will discuss BPM-020 revisions at their August 9, 2023, meeting.

MISO reviewed a proposed timeline for implementation of FAC-002-4 revisions.

Date	Task
June 20 IPWG	Introduce Topic and proposal to implement FAC-002-4
June 21 PSC	Introduce Topic and proposal to implement FAC-002-4
August 8 IPWG	Review proposed BPM redlines and Tariff for <u>generation</u> facilities
August 9 PSC	Review proposed BPM redlines for <u>transmission</u> and <u>electricity end-user</u>
September 26 IPWG	Final BPM redlines for <u>generation</u> facilities
September 27 PSC	Final BPM redlines for <u>transmission</u> and <u>electricity end-user</u>
Oct 11 PAC	Review BPM drafts from subcommittees
Nov 15 PAC	Finalize BPM
Nov 30	Publicly Post BPM

MISO requested feedback on **BPM-015 and Tariff redlines for FAC-002-4 revision** to update Qualified Change term by August 30, 2023. Feedback requests and responses are managed through the Feedback Tool on the MISO website: <https://www.misoenergy.org/stakeholder-engagement/stakeholder-feedback/>.

7. Inverter-based resource performance requirements^ (P. Dalton)

Next steps on IEEE 2800 implementation

MISO discussed proposed Inverter-Based Resource (IBR) performance requirement implementation approach based on system reliability needs. MISO explained that industry has identified an immediate need to specify IBR performance that supports system reliability. Following a stepped approach to adopt IEEE 2800-2022, MISO incorporated many stakeholder feedback suggestions in the revised Tariff redlines specifying IBR performance requirements. MISO is proposing additional flexibility in the proposed tariff language to address implementation concerns raised by stakeholders in formal feedback. MISO is requesting additional stakeholder feedback from the IPWG before taking the proposal to the Planning Advisory Committee (PAC). Tariff redlines (Attachment X: Appendix 6 and G) are posting with IPWG meeting materials.



MISO is still reviewing FERC Order 2023, which in part modifies the pro forma agreements to incorporate ride through performance requirements. MISO's proposed redlines likely cover the ride through requirements in FERC's Order 2023. IEEE 2800 frequency disturbance ride-through capability requirements are performance-based and extend beyond the NERC PRC-024-3 "No Trip Zone" based on what the equipment is technically capable of. Specific IBR performance requirements are needed now as NERC standard development for IBR advances over the coming years.

MISO shared that its proposal takes a stepped approach, prioritizing only the highest priority performance for adoption now. MISO is not alone in adopting IEEE 2800 now to address potential IBR performance gaps. MISO reviewed a list from Electric Power Research Institute (EPRI) of approaches being taken by other entities.

MISO reviewed key themes that emerged from stakeholder feedback responses. MISO made several substantive draft redline Tariff changes based on stakeholder input. MISO proposes using the discussion in IEEE 2800 Annex C to conceptually define system strength and weak grid as a starting point for case-by-case consideration. MISO adopted stakeholder feedback for *enter service* criteria and performance as defined by IEEE 2800. MISO views the Reference Point of Reliability (RPA) at Point of Interconnection (POI) selection as the best reliability-supporting selection.

MISO views a degree of flexibility for DPP-2022 performance requirements as striking a balance between facilitating needed reliability attributes while managing pockets of equipment conformance uncertainties. Regarding DPP-2022, MISO proposed for exception requests to be documented from the equipment manufacturer based on a technical constraint. Exception requests for GIAs executed on or after January 1, 2025, to not be granted. For the DPP-2023-Cycle, based on feedback, MISO proposes full compliance with all MISO-adopted IEEE 2800 requirements.

MISO will continue to assess potential interactions between FERC Order 2023 and MISO's proposed tariff redlines. Stakeholders are invited to share feedback on MISO's revised tariff redlines, with particular focus on the new paragraph on conformance flexibility. MISO will respond to stakeholder feedback and adjust Tariff redline language as needed prior to presenting the proposed changes to PAC. As the Tariff redlines are finalized, MISO is continuing to evaluate whether BPM changes are needed. MISO requested feedback on **Proposed IBR Performance Requirements** by August 29, 2023. Feedback requests and responses are managed through the Feedback Tool on the MISO website: <https://www.misoenergy.org/stakeholder-engagement/stakeholder-feedback/>.

8. New Business (All)

None



9. Action Items (M. McGirr)

Action Item	Owner	Date	Status
MISO requests feedback on Proposed IBR Performance Requirements by August 29, 2023.	Stakeholder Relations	08/08/2023	Closed
MISO requests feedback on BPM and Tariff redlines for FAC-002-4 revision to update Qualified Change term by August 30, 2023.	Stakeholder Relations	08/08/2023	Closed
Repost Materials <ul style="list-style-type: none">• Item 03a FERC Status Report – include FERC 206 filing related to DFAX. Future FERC Status Reports will include 206 filings.• Item 04, 06, & 07– update typos	Stakeholder Relations	08/08/2023	Closed

10. Adjourn

Meeting adjourned at 12:33 pm ET/11:33 am CT.

Next Meeting: September 26, 2023