



Overview of Changes for FERC Order 2222

Market Subcommittee
FERC Order 2222 Compliance (MSC -2019-2)

April 18, 2024

--- MISO ---
Roadmap

Purpose & Key Takeaways



Purpose:

Provide an overview of MISO's Order 2222 updated compliance plan in preparation for filing on May 10, 2024

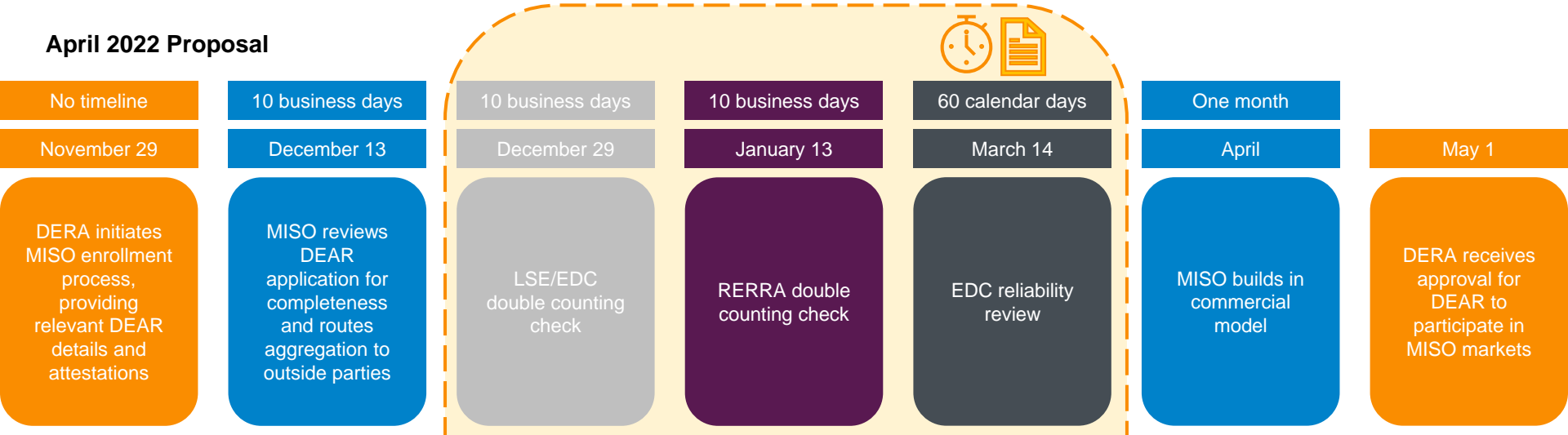
Key Takeaways:

- MISO's conceptual design largely remains the same with the addition of a multi-node participation option
- Additional clarifications and details have been developed to address the deficiencies identified in the October 2023 Order on Compliance
- MISO will phase implementation with some functionality available by 2027 with the remainder by 2030
- Will take questions at each section break

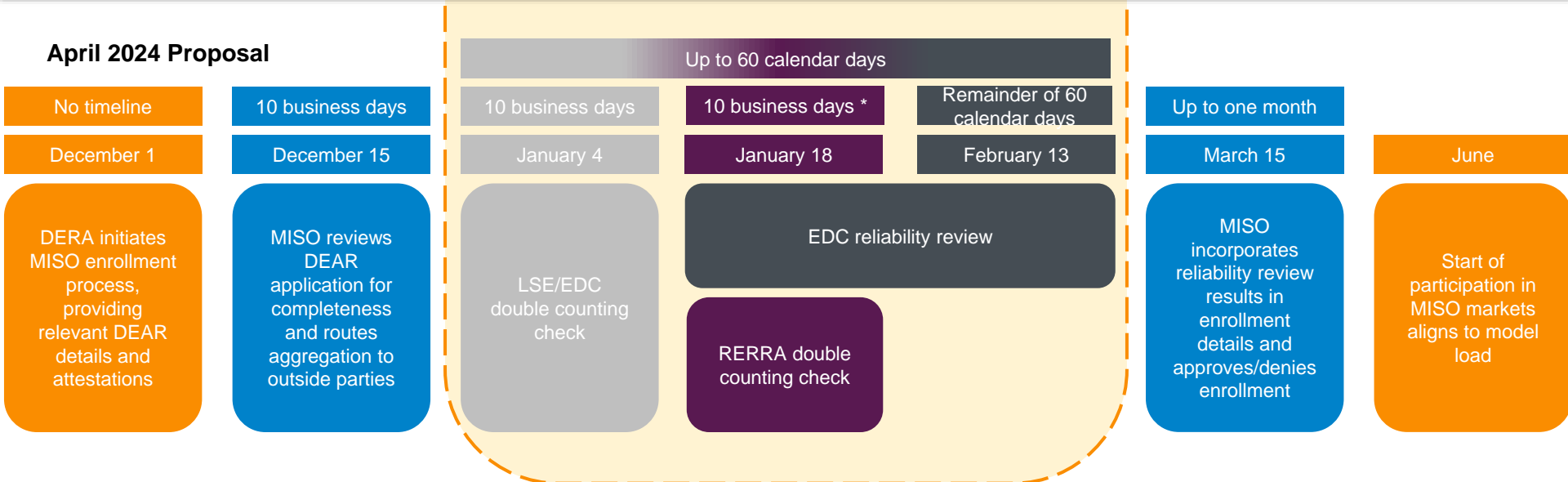
Eligibility & Reliability Reviews

FERC clarified reliability reviews AND eligibility reviews must be completed in 60 calendar days

April 2022 Proposal

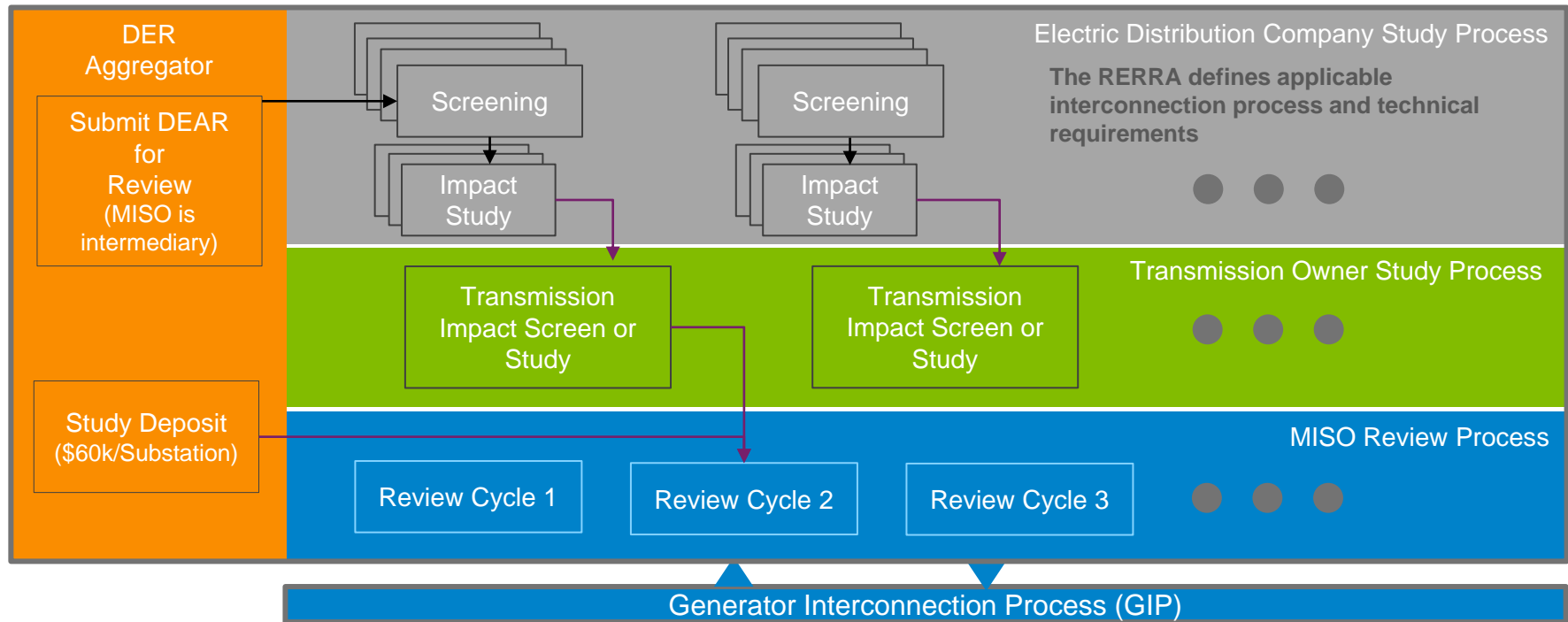


April 2024 Proposal



* If the RERRA has not completed its eligibility review in the **first 20 business days**, MISO will consider the resource's eligibility based on the EDC 4M MWh/year threshold. The RERRA may update the eligibility status at any time.

FERC directed MISO to address additional details of Transmission Owner and MISO evaluations of potential impacts found during the EDC Reliability Review



- Proposed process steps are the same as a DER interconnection affected system study however, they are separate processes. The GIP is also separate parallel process.
- DEAR registrations will first be reviewed by the EDC. If impacts are found, the DEAR can be withdrawn, modified, or continue with studies.
- MISO will develop business practices to allocate mitigation costs associated with DEAR transmission impacts using the cost-causation principle.

Dispute Resolution

Key Changes

- Disputes regarding MISO's coordination or application of the DEAR eligibility and reliability review process including those regarding timing and transparency of such review process will follow the procedure found in Attachment HH.
- Disputes related to MISO Reliability Review results will follow the Generator Interconnection Procedure found in Attachment X.
- Disputes related to a party outside of MISO's authority's activities in the eligibility and reliability review process are exempted from Attachment HH and Attachment X dispute processes.
- MISO will review a DERA's participation in the market if their settlements are successfully disputed more than 10% of the time and exceed the materiality thresholds.

Eligibility to Participate

MISO will use DRR Type I to address locational criteria in Order 2222

Settlement Only Distributed Energy Aggregated Resource (SODEAR)

- New model
- Energy
- No commitment or dispatch
- Multi-Node
- No Telemetry, Price Taker
- Distributed Generation + Distributed Storage
- Provide meter data
- Minimum size of 0.1 MW

Demand Response Resource (DRR) Type 1

- Existing model (On or Off)
- Capacity, Energy, or Contingency Reserve
- MISO commits
- Multi-Node
- Local Balancing Authority, Single Load Serving Entity
- Uses measurement and verification (M&V) with a single baseline methodology
- Minimum size of 1 MW

Distributed Energy Aggregated Resource (DEAR)

- New model
- All Products
- Self commits, MISO dispatch
- Single Node
- Telemetry Required
- Heterogeneous
- May use more than 1 baseline methodology
- Minimum size of 0.1 MW

The rules for DRR Type I would stay the same.

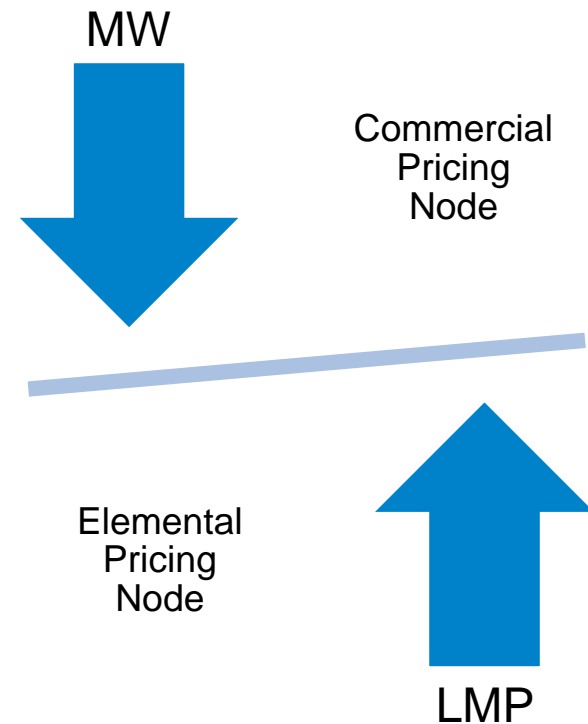
Dropped Option 

New Option 

Filed Option 

Distribution Factors are used to define the relative relationship between Elemental Pricing Nodes and Commercial Pricing nodes

“The Aggregate Price Node weighting factors are specified by the Market Participant when the asset is registered.”¹



Operational Coordination

MISO Updated Operational Coordination Details Based on Stakeholder Feedback

Optionality of activities/communications

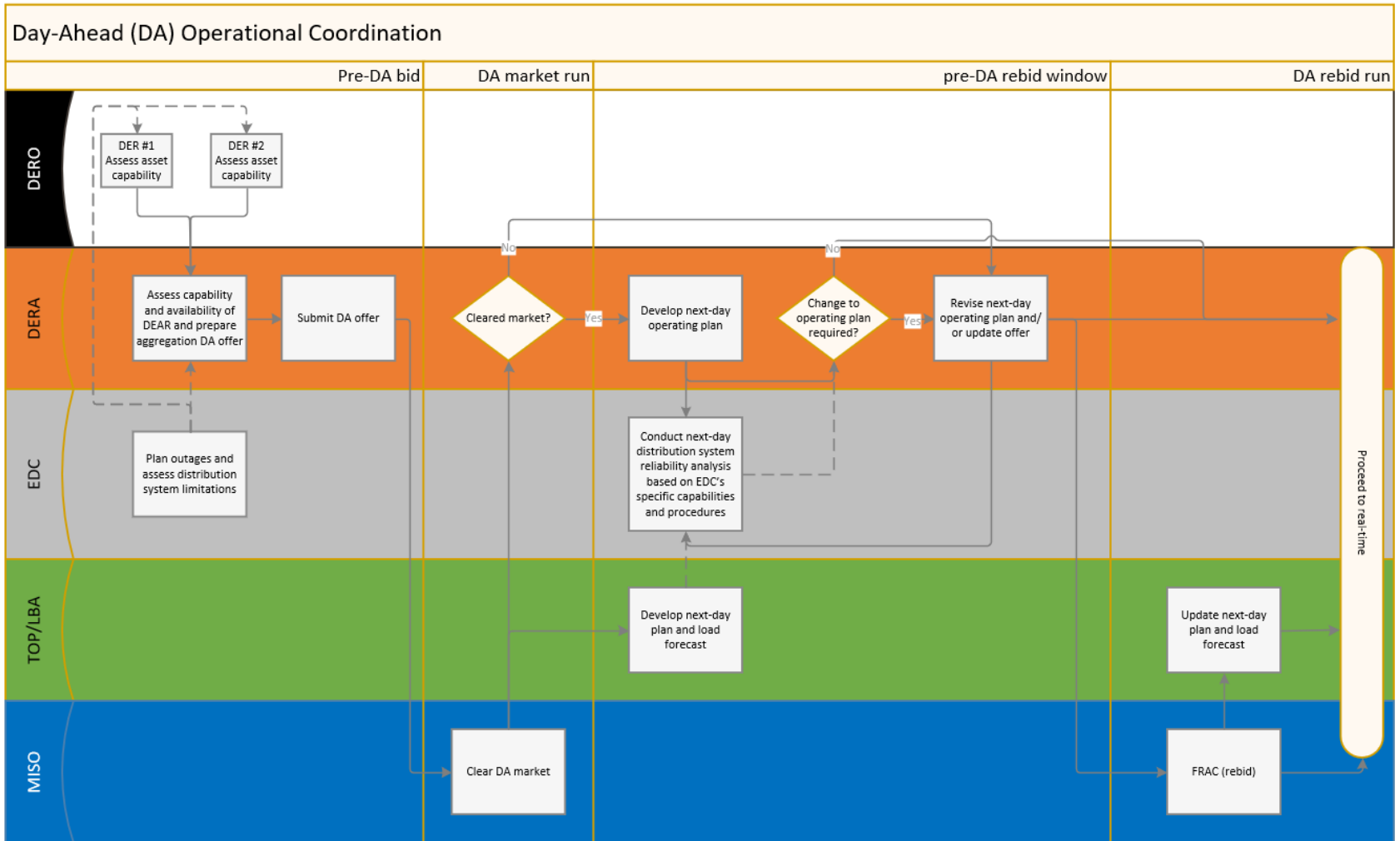
- The EDC may perform outage, reliability, or impact analysis
- The EDC may be informed of DEAR dispatch instructions from MISO or an LBA may pass along MISO's dispatch

EDC-DERO Communications

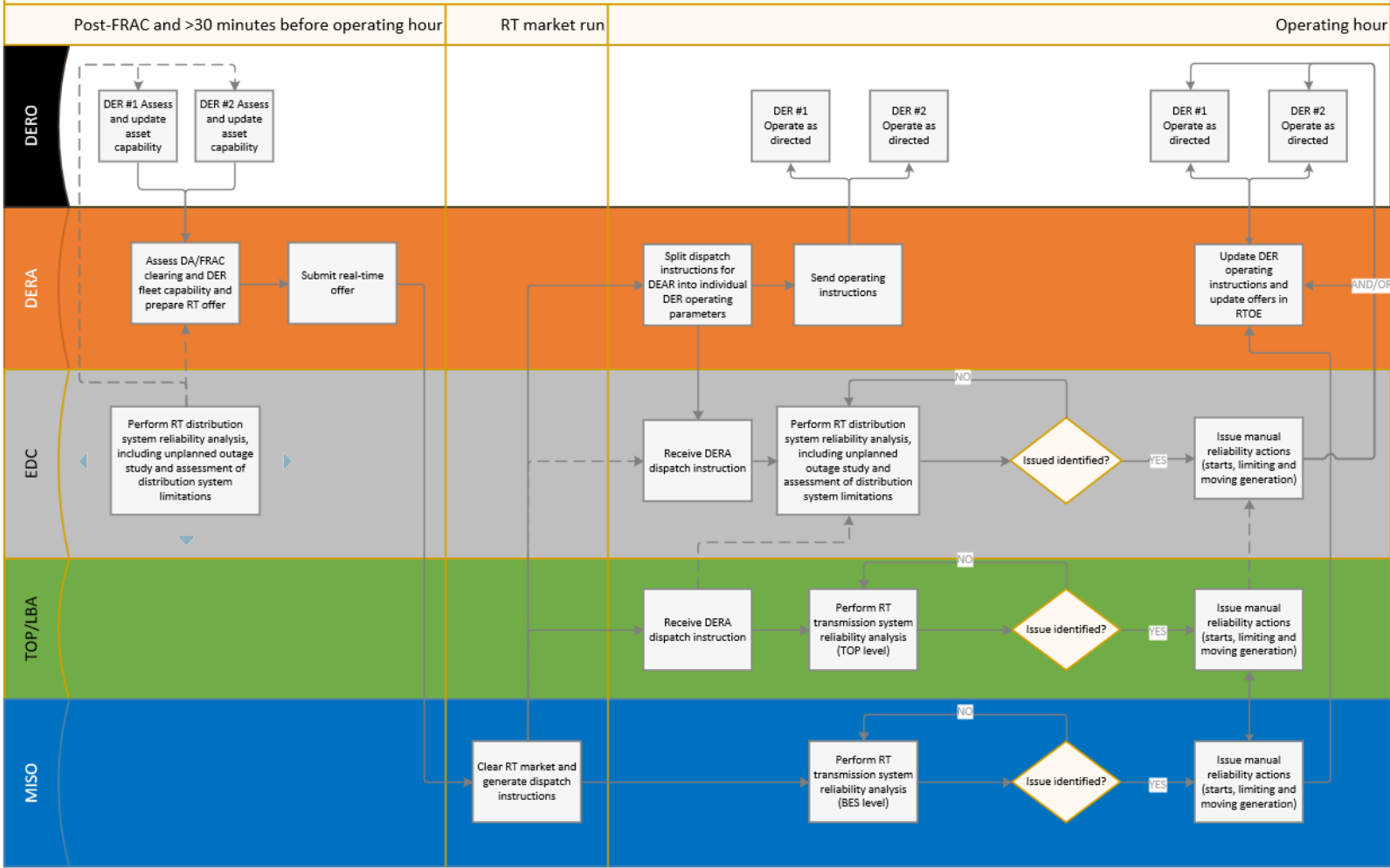
- If an EDC is going to communicate with a DERA, they may communicate to a DERA directly or through a DERO

Bi-directional communication in real time

- DERO-DERA, details depend on local systems and practices
- MISO-DERA, through dispatch instructions and Real-time Offer Enhancement (RTOE)
- MISO-TO, status-quo



Real-Time (RT) Operational Coordination



Key for Roles:

- EDC:** Electric Distribution Company
- TO:** Transmission Owner
- DERA:** DER Aggregator
- DERO:** DER Owner
- MISO:** Midcontinent Independent System Operator
- RERRA:** Relevant Electric Retail Regulatory Authority



Tariff Language

FERC Directive (Paragraph)	Tariff Section
<ul style="list-style-type: none"> Clarify types of disputes subject to MISO dispute resolution (P 28) Clarify how MISO will resolve disputes it determines are within its authority (P 312) 	Module A, Section 12 Attachment X, Section 13.5
<ul style="list-style-type: none"> Require DERA to provide list of individual DERs participating in a DEAR (P 171) EDC Technical Review can be paused (P 267) Clarify scope of reliability review is limited to incremental impacts (P 296) Timeline/standard it is proposing to apply to transmission owner and MISO Reliability Reviews (P 299) More detail on the transmission owner and MISO Reliability Review processes (P 304) Require study deposits for Reliability Review (P 305) Rules related to cost allocation (P 306) 10% threshold for successful disputes (P 313) Operational coordination between: (1) the distribution utility and the DERA; and (2) MISO and the distribution utility (P 339) Require DERA to submit an attestation that the DEAR complies with the tariffs and operating procedures of the EDCs and rules / regulations of the RERRA (P 379) 	Module C, Section 38.7 Module C, Section 38.1.1.z
<ul style="list-style-type: none"> DEAR have restrictions within the operating hour (P336) 	Module C, Section 40.2.7C
<ul style="list-style-type: none"> Remove > 10 MW threshold for market power mitigation provisions (P59) 	Module D, Sections 63.3, 63.4.1, 64.1.1, 64.1.3, 64.1.4, 65.2.2, 65.3.1

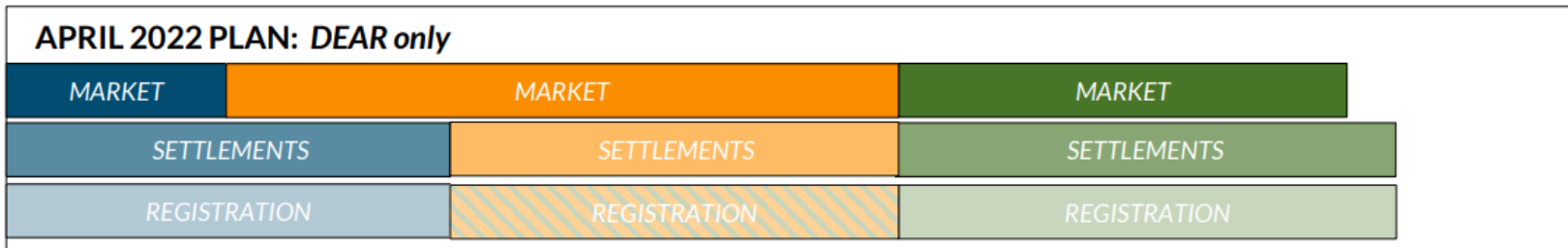
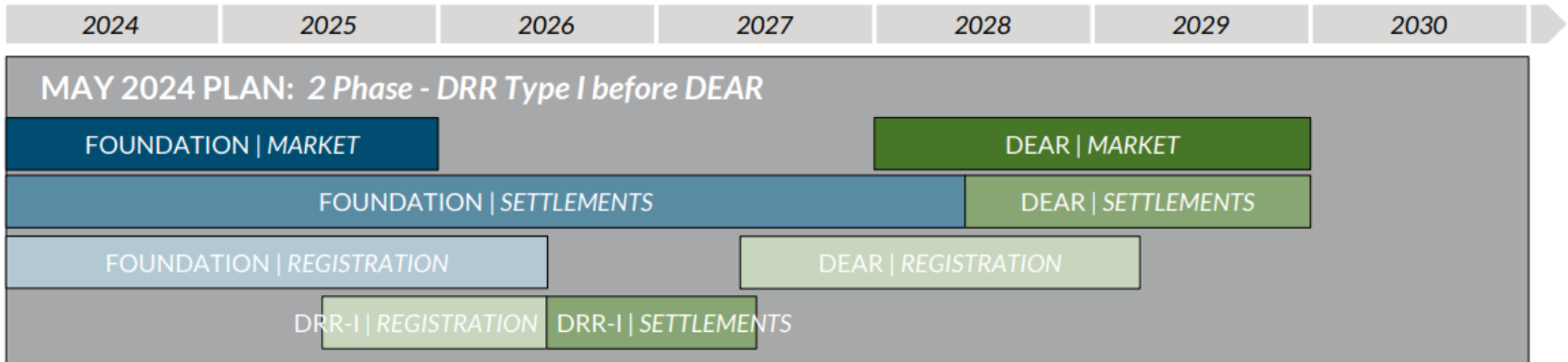
FERC Directive (Paragraph)	Tariff Section
<ul style="list-style-type: none"> Propose alternative locational requirements that are as geographically broad as technically feasible (P 136) 	Module A & 38.7
<ul style="list-style-type: none"> All aspects of the distribution utility's review in the 60-day period (P 100) Distribution utility review period that does not exceed 60 days (P265) RERRA review relative to 60 days (P266) Distribution utility review process will be shared with the DERA (P 269) Rules related to cost allocation (P 306) 	Section 38.7.A.iii
<ul style="list-style-type: none"> Include specific, transparent criteria by which an EDC will determine during its review whether each proposed DER is capable of participating in a DEAR (P 294) 	Section 38.7.A.ii
<ul style="list-style-type: none"> Distribution utilities to override MISO dispatch (P 337) 	Module C Section 38.1.1.aa
<ul style="list-style-type: none"> Role for the RERRA (P 353) 	38.1.1 & 38.7
<ul style="list-style-type: none"> Revisions to require the DERA to retain performance data of individual DERs for auditing purposes. (January 29, 2024, Order on Rehearing, P 20) 	Module C Section 38.7.E

Clarifications outside of Tariff

FERC Directive (Paragraph)	Clarification
<ul style="list-style-type: none"> Reliability Review, Affected System Study & Generator Interconnection Process (P 29) 	<p>MISO Reliability Review of a DEAR, MISO Affected System Study of a DER interconnection, and the MISO Generation Interconnection Process are separate processes.</p>
<ul style="list-style-type: none"> Interconnection of DER independent of DEAR (P 30) 	<p>A DER connected to distribution facilities that provide Wholesale Distribution Service (WDS), which qualifies as Transmission System under MISO's Generation Interconnection Process (GIP), may elect, but are not required, to use MISO's GIP.</p>
<ul style="list-style-type: none"> Transmission charge exemptions afforded to ESR (P 54) 	<p>For this situation to arise a DEAR must be comprised completely of distributed storage (i.e., meets all items in definition of an ESR in MISO's Tariff), have transmission service, be dispatched to provide regulation down, and withdraw energy from the transmission system to charge storage.</p>
<ul style="list-style-type: none"> Distribution Factors (P 143) 	<p>The existing DRR Type I methodology for distribution factors will be used.</p>
<ul style="list-style-type: none"> DERA designating its distribution utility as the MDMA (P 218) 	<p>Adding language to BPM 001 Section 6.3.7 Certificate Representing Agency Relationship between Applicant and Scheduling and/or Meter Data Management Agent (MDMA) to clarify that the DERA may designate the distribution utility as the MDMA.</p>

Implementation Plan & Effective Dates

Order 2222 Implementation Plan



DRR-I Enrollment
September 1, 2026

DRR-I Market Participation
June 1, 2027

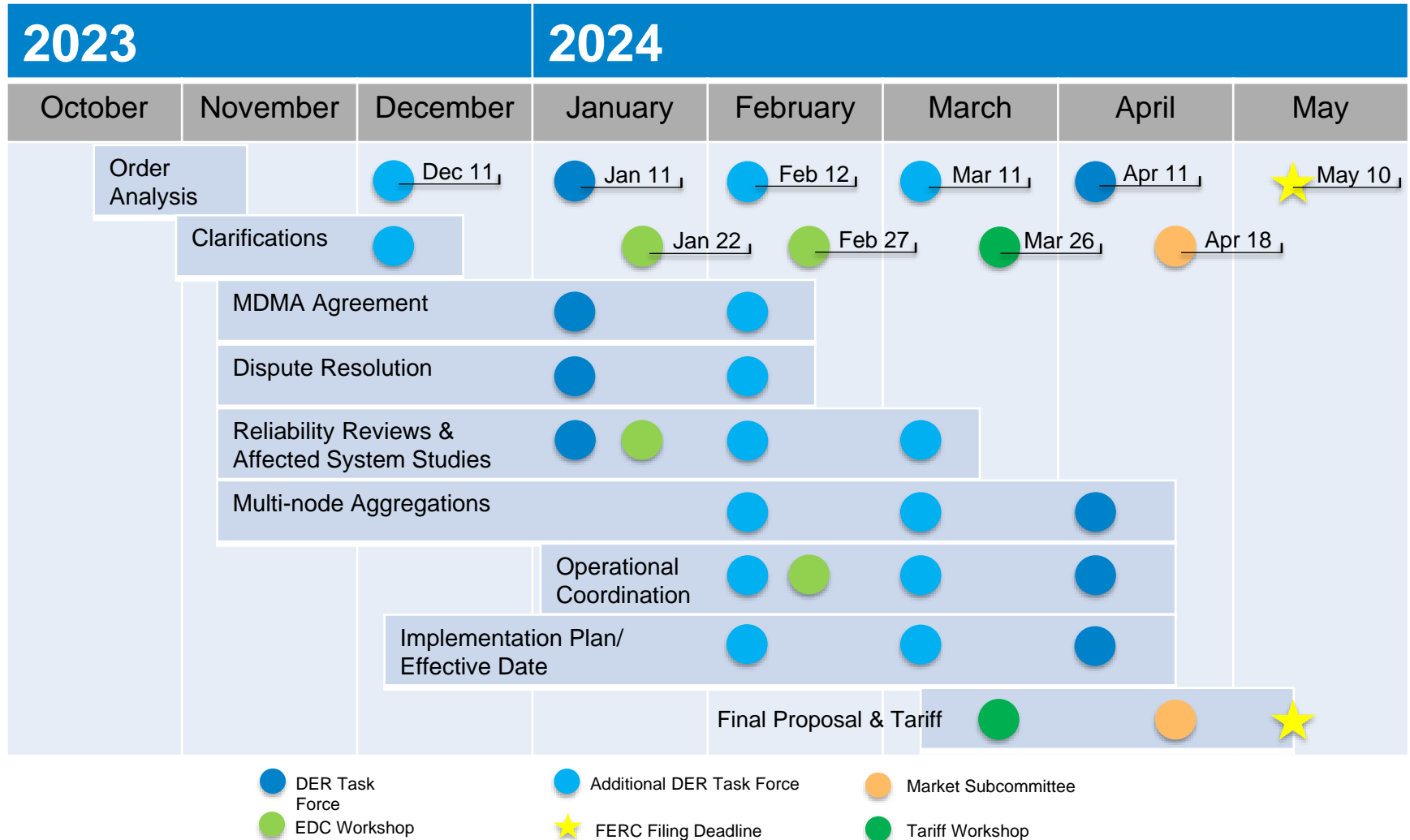
DEAR Enrollment
June 1, 2029

DEAR Energy & Ancillary Services Market Participation
January 1, 2030

DEAR Capacity Market Participation
June 1, 2030

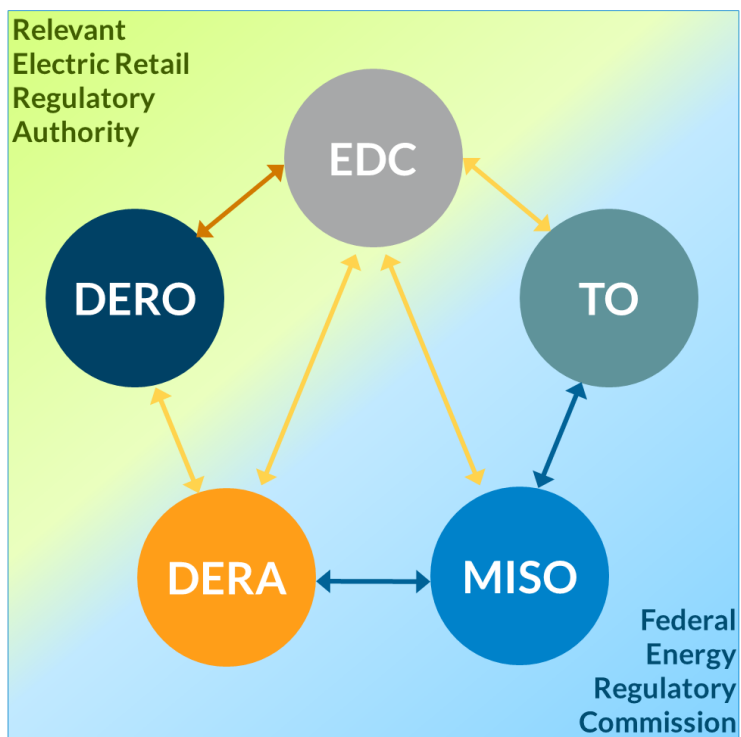
Next Steps

Compliance Filing Timeline



MISO's compliance with Order 2222 is necessary, but not sufficient, to unlock the potential benefits of DERs and their participation in wholesale markets

A complex set of systems and processes must be developed and integrated among all parties

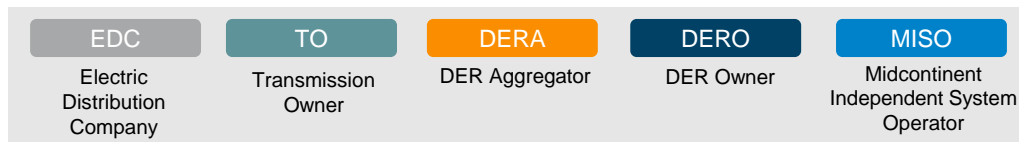


LINES:

ORANGE – Communications between parties not subject to the MISO Tariff. These may be specified by the RERRA or determined contractually between parties.

YELLOW – Communications where only one party is subject to the MISO Tariff. The Tariff creates a communication obligation, execution of which is outside of MISO's processes, but may be specified by the parties.

BLUE – Communications between parties subject to MISO's Tariff. MISO will specify how and what is communicated and monitor compliance.



Contact Information

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Appendix

Key Requirements of FERC 2222: Section C: Eligibility to Participate

- Allow DER aggregation market participation under one or more participation models
- Allow heterogeneous DER aggregation
 - Aggregator is responsible to meet performance and registration requirements
- Allow dual participation even if DER is in retail programs
 - Allows narrowly designed restrictions to prevent double payment
 - RERRAs allowed to limit DER participation to retail markets only
- 100 kW minimum size requirement
 - Allows for a maximum size or requires explanation why a maximum DEAR size is not needed
- Requires a maximum size for individual DERs within an aggregation or an explanation why no such limit is needed
- Single Resource aggregation is allowed under the Order

Legal citations O2222 [P 61](#), [P 129](#), [P 130](#), [P 142](#), [P 160](#), [P 162](#), [P 179](#), [P 180](#), [P 185](#), [P 186](#)

Over the last five years, five or fewer Load Zones had Real-Time price differences less than \$1 from the nodal LMP indicating pervasive congestion

Number of Load Zones with Maximum Absolute Real-Time Price Separation between the Load Zone LMP and nodal LMP less than \$1, \$2 and \$5

Year	Less than \$1	Less than \$2	Less than \$5
2019	3	5	8
2020	0	0	1
2021	4	5	8
2022	5	7	13
2023	5	6	9

415 applicable load zones as of March 2024

Excludes load zones with 1 or 2 EPnodes

Excludes load zones with multiple EPnodes at a single substation

How did MISO select the alternatives under consideration for the broadest technically feasible scope for multi-node aggregations?

- All internal Resources and Load needs to be represented in a Local Balancing Authority metered boundary.
- BPM 26 Demand Response limits aggregation to a single Load Serving Entity and single Local Balancing Authority Area.
- Stakeholder feedback pointed out that multiple Electric Distribution Companies may reside in a single Load Serving Entity.
 - Operational coordination and enrollment may be more challenging if the aggregation crosses Electric Distribution Companies

Stakeholder feedback suggests that the broadest technically feasible scope align with the product dispatch

- MISO simultaneously co-optimizes Energy and Ancillary Services
 - Energy is cleared at each resource
 - Operating Reserves is priced at the Reserve Zone, but cleared at each resource
 - Reserve Procurement Constraints verify the deliverability of reserves for selected Transmission Constraints in the dispatch

MISO limits reserve clearing to avoid exceeding the selected Transmission Constraint limit based on the location.

Attachment TT describes Consumption Baselines

Metered Generation Baseline

Calculated Baseline (no behind-the-meter generation)

Direct Load Control Baseline

Custom Baseline

Operating Reserve Service (Regulation Qualified)

Operating Reserve Service (Not Regulation Qualified)

Metered Generation Example for a DRR Type 1

- Day-Ahead Offer
 - Energy
 - Economic Max of 2.3 MW (hour 6 to 18)
 - Economic Max of 1.3 MW (hour 0 to 5 and 19 to 23)
- Day-Ahead Result
 - Commit for 1.0 MW of Energy in hour 17
- Real-Time respects Day-Ahead commitment
- Metered Generation output at
 - 15:00 – 1 MW
 - 16:00 – 1 MW
 - 17:00 – 2.0 MW
 - 18:00 – 1 MW
- Types of DERs
 - Roof-Top Solar: 0.4 MW
 - Small Wind: 0.3 MW
 - Solar Gardens: 0.6 MW
 - Small Diesel: 1.0 MW
- Calculated DRR Type I Output
 - 17:00 metered output -baseline
 - 2.0 MW – 1 MW = 1.0 MW
- Schedule 53 for accreditation
 - Look at Targeted Demand Reduction during RA hours
 - Schedule 53A proposed for 2028/2029

Calculated Load Control Baseline

- RT Offer
 - Energy
 - Target Demand Reduction Level (1 MW)
- FRAC result
 - Commit for 1.0 MW in hour 18
- Consumption baseline
 - Average of historical load
 - 2000 kW
 - Metered withdrawal
 - 1000 kW
- Types of DER
 - Water Heater Program – 1.0 MW
 - Thermostats – 1.0 MW
 - Air Conditioning Program – 1.0 MW
- Calculated DRR Type 1 Output
 - Consumption Baseline – 18:00 metered output
 - $2\text{MW} - 1\text{MW} = 1\text{MW}$
- Schedule 53 for accreditation
 - Look at Targeted Demand Reduction during RA hours
 - Schedule 53A proposed for 2028/2029

Operating Reserve (No Regulation)

- Real-Time Offer
 - Spinning Reserve
- Real-Time Result
 - Commit for 1.0 MW of spinning reserve in hour 14
- Deploy Spinning Reserve at 14:15
- Metered output
 - 14:10 – 2 MW
 - 14:15 – 2 MW (Start of event)
 - 14:20 – 1.5 MW (5 minutes into the event)
 - 14:25 – 1.0 MW (10 minutes into the event)
- Types of DER
 - Water Heater Program – 1.3 MW
 - Thermostats – 1.2 MW
 - Air Conditioning Program – 1.5 MW
- Calculated DRR Type I Output
 - Metered output at the start of the event – Metered output at 10 minutes into the event
 - $2 \text{ MW} - 1.0 \text{ MW} = 1.0 \text{ MW}$
- Schedule 53 for accreditation
 - Look at Targeted Demand Reduction during RA hours
 - Schedule 53A proposed for 2028/2029