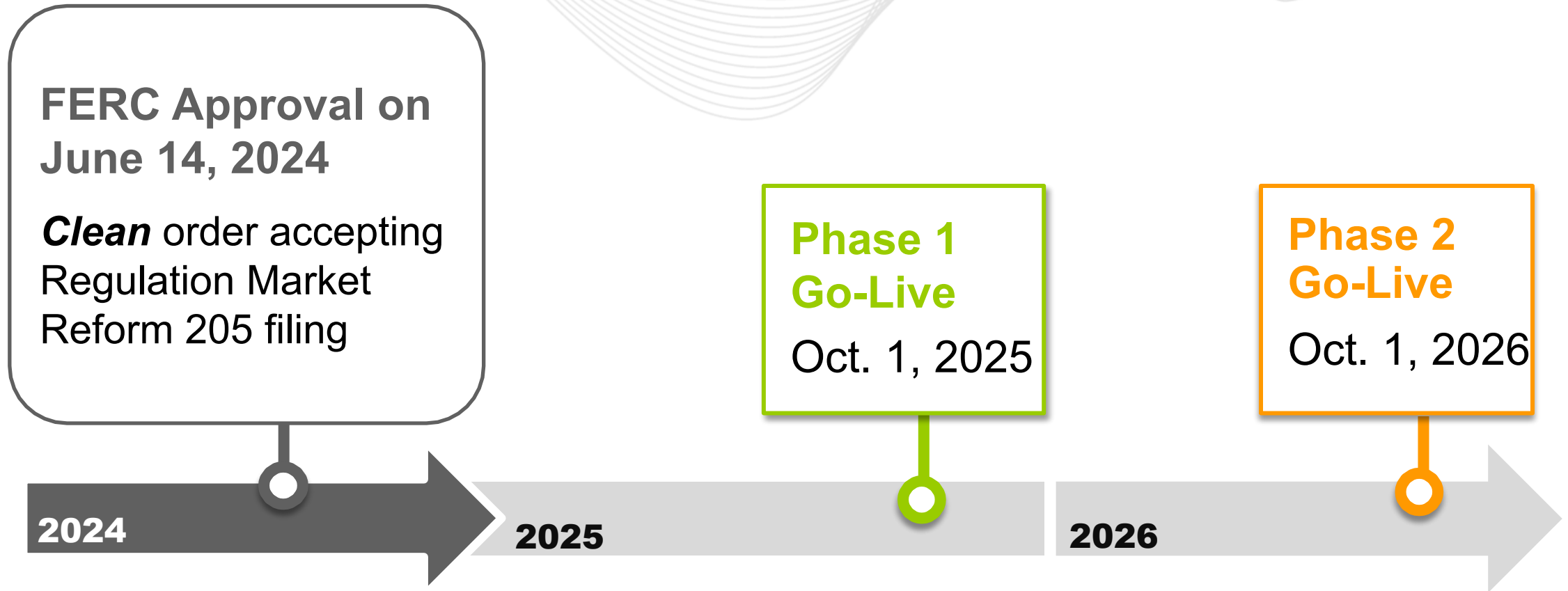# Regulation Market Redesign Phase 1

Suzanne Coyne, Market Settlements Development

Nick DiSciullo, Market Settlements Development

Market Settlements Subcommittee

May 5, 2025

FERC Approval on June 14, 2024

Clean order accepting Regulation Market Reform 205 filing

Phase 1 Go-Live

Oct. 1, 2025

Phase 2 Go-Live

Oct. 1, 2026

2024

2025

2026

#	Design Components	Summary Description
1	**Signals and Products**	Change from **two** signals (RegA and RegD) bidirectional to **one** signal bidirectional that all resources that are assigned Regulation in a given market interval will follow.
2	**Requirement MW**	Changes to better reflect operational needs, with consideration both to historic and future system conditions
3	**Performance Scoring**	Change from accuracy, delay and precision to precision only.
4	**Offer and Clearing Timing**	Eliminate "cost increase in VOM" except for Reg-only resources, change from hour clearing and commitment to 30-minute clearing and commitment.
5	**Opportunity Cost Calculation Reform**	1. Use the schedule the resource is running for energy or else the cheaper of available schedule for offline. 2. Use tracking desired MW at LMP ramp rate limited. 3. Use the area between LMP and the energy schedule the resource is running on.
6	**Settlement**	For the eligible resources, Settlement will calculate the shoulder interval opportunity cost for two five-minute ramp-in intervals before the resource Regulation operation and two five-minute ramp-out intervals following the resource Regulation operation (currently, three intervals ramp-in and three intervals ramp-out). Also, Settlement will update the calculation for the Regulation Mileage Credit (currently Performance Credit) such that the mileage ratio is equal to [Real-Time Regulation

- Regulation Market Capability Clearing Price Credit

$$Regulation\ MW \times Actual\ Performance\ Score \times \frac{RMCCP}{12}$$

If 5-minute performance score < 0.25, credit = $0

- Regulation Market Mileage Clearing Price Credit

$$Regulation\ MW \times Actual\ Performance\ Score \times \frac{Actual\ Mileage}{Daily\ Historic\ Mileage} \times \frac{RMMCP}{12}$$

Phase 1 changes
- Bidirectional mileage ratio using actual and historic mileage replaces Reg A and Reg D mileage ratios.
- New Mileage Clearing Price and Credit terminology replaces Performance Clearing Price and Credit.

- If a pool-scheduled resource is not compensated for its offer plus any opportunity costs via the clearing prices, a resource receives a Lost Opportunity Cost Credit.

If 5-minute performance score < 0.25, credit = $0

$$Lost\ Opportunity\ Cost\ Credit =$$

$$\frac{Regulation\ Offer + Intra\ Commitment\ Opportunity\ Cost + Shoulder\ Opportunity\ Cost}{12} - Regulation\ Clearing\ Price\ Credits$$

Phase 1 changes
- Benefits factor is no longer used to adjust the opportunity cost
- Shoulder opportunity cost calculation impacts

Status Quo

Shoulder Intervals Before (Ramp In Intervals)

- Costs incurred in *3 shoulder intervals* preceding initial regulating *hour* if unit moves uneconomically into its regulating band to comply with next *hour's* regulation assignment

Regulation Commitment Intervals

- Cost for each five-minute interval during regulating commitment period from reducing or raising unit's output uneconomically for purpose of providing regulation

Shoulder Intervals After (Ramp Out Intervals)

- Costs incurred in *3 shoulder intervals* following final *hour* of regulation assignment if unit moves from uneconomic regulation set-point back to economic dispatch set-point

Phase 1 changes

- Calculated for *2 shoulder intervals* to align with SCED 10-minute look ahead
- Calculated based on *30 minute* commitment periods instead of *hour*
- Uses Tracking Ramp Limited Desired MW instead of LMP Desired (not ramp limited)

Eligibility Requirements:

- Ramp-in shoulder intervals: Regulation assignment starts at the top of the hour (HH:00 - HH:05) *or the Regulation assignment starts at the bottom of the hour (HH:30 - HH:35)*
- Ramp-out shoulder intervals: Regulation assignment ends at the top of the following hour (HH:55 - HHnext:00) *or the Regulation assignment ends at the bottom of the hour (HH:25 - HH:30)*
- Regulation assignment is pool scheduled only
- CTs, Diesels, Hybrids, Solar, Wind, Storage/ESR, Nuclear, and Hydro are <u>not</u> eligible
- Resource is online and generating in the shoulder five minute intervals
- Resource is not regulating in the shoulder five minute intervals
- *Tracking Ramp Rate Limited Desired* from the shoulder interval is not already within regulation limits.

- **RMCCP Charge and RMMCP Charge**

  - LSEs, or other Regulation buyers, are charged hourly obligation ratio share of total hourly RMCCP credits and RMMCP credits .

  - Hourly Regulation obligations equal the real-time load ratio share of total amount of Regulation supplied, excluding mileage ratio component, by PJM that hour, adjusted for any bilateral Regulation transactions

- **Lost Opportunity Cost Charge**

  - Net Regulation Purchasers are charged hourly purchase ratio share of total hourly Lost Opportunity Cost Credits.

  - Hourly Regulation Purchase is the Hourly Regulation Obligation less any self-scheduled Regulation MW

Phase 1 change
- Only change is terminology: New Mileage Clearing Price and Credit terminology replaces Performance Clearing Price and Credit.

MSRS Report	Phase 1 Impact
Regulation Credits	Archived as of Oct. 1, 2025
Load Response Regulation Credits	Archived as of Oct. 1, 2025
Regulation Market Credits	New Report
Regulation Market Lost Opportunity Cost Credits	New Report
Hydro Peak Period Average LMP Details	New Report
Regulation Summary	Existing Report - column names changing
Generation Credit Summary	Existing Report - column names changing
Generation Portfolio Credit Summary	Existing Report - column names changing

- This report displays details behind the Regulation Market Clearing Price Credits for Generation Units and Load Response Registrations

The following columns will appear in the body of the report:

Online and CSV Column Name	XML Column Name	Column Number	Data Type
Customer ID	CUSTOMER_ID	4000.01	INTEGER
Customer Code	CUSTOMER_CODE	4000.02	VARCHAR2(6)
EPT Interval Ending	EPT_INTERVAL_ENDING	4000.4	VARCHAR2(40) mm/dd/yyyy HH24:MM format (Displays first interval of the day as hour 0 minute 05 and last interval of the day as hour 24 minute 00)
GMT Interval Ending	GMT_INTERVAL_ENDING	4000.41	VARCHAR2(40) mm/dd/yyyy HH24:MM format (Displays first interval of the day in relation to EPT interval as hour 04 minute 05 or hour 05 minute 05 (EDT/EST depending) and last interval of the day as hour 04 minute 00 of the next day or hour 05 minute 00 of the next day (EDT/EST depending))
Market Resource ID	MRKT_RESRC_ID	4001.16	NUMBER
Market Resource Name	MRKT_RESRC_NAME	4001.17	VARCHAR2(75)
Market Resource Type	MRKT_RESRC_TYPE	4001.18	VARCHAR(10)
Resource Ownership Share	RESRC_OWN_SHARE	4001.19	NUMBER
Regulation Product Type	REG_PRODUCT_TYPE	4001.38	VARCHAR(30)
PJM-Assigned Reg MW	PJM_ASSIGNED_REG_MW	2340.63	NUMBER(22,3)
Self-Scheduled Reg MW	SELF_SCHEDULED_REG_MW	2340.64	NUMBER(22,3)
Actual Mileage	ACTUAL_MILEAGE	2340.57	NUMBER
Historic Mileage	HISTORICAL_MILEAGE	2340.58	NUMBER
Mileage Ratio	MILEAGE_RATIO	2340.46	NUMBER
Performance Score	PERF_SCORE	2340.35	NUMBER
RMCCP ($/MWh)	RMCCP	3001.44	NUMBER
RMMCP ($/MWh)	RMMCP	3001.64	NUMBER
RMCCP Credit ($)	RMCCP_CREDIT	2340.36	NUMBER
RMMCP Credit ($)	RMMCP_CREDIT	2340.48	NUMBER
Total Regulation Clearing Price Credits ($)	TOT_RMCP_CREDIT	2340.49	NUMBER
Version	VERSION	4000.07	VARCHAR2(12)

Regulation Market Lost Opportunity Cost Credits (New)

- This report displays details behind the Regulation Market Lost Opportunity Cost Credits for Generation Units and Load Response Registrations

The following columns will appear in the body of the report:

Online and CSV Column Name	XML Column Name	Column Number	Data Type
Customer ID	CUSTOMER_ID	4000.01	INTEGER
Customer Code	CUSTOMER_SHORT	4000.02	VARCHAR2(6)
EPT Interval Ending	EPT_INTERVAL_ENDING	4000.4	VARCHAR2(40) mm/dd/yyyy HH24:MM format (Displays first interval of the day as hour 0 minute 05 and last interval of the day as hour 24 minute 00)
GMT Interval Ending	GMT_INTERVAL_ENDING	4000.41	VARCHAR2(40) mm/dd/yyyy HH24:MM format (Displays first interval of the day in relation to EPT interval as hour 04 minute 05 or hour 05 minute 05 (EDT/EST depending) and last interval of the day as hour 04 minute 00 of the next day or hour 05 minute 00 of the next day (EDT/EST depending))
Market Resource Id	MRKT_RESRC_ID	4001.16	NUMBER
Market Resource Name	MRKT_RESRC_NAME	4001.17	VARCHAR2(75)
Market Resource Type	MRKT_RESRC_TYPE	4001.18	VARCHAR(10)
Resource Ownership Share	RESRC_OWN_SHARE	4001.19	NUMBER
PJM-Assigned Reg MW	PJM_ASSIGNED_REG_MW	2340.63	NUMBER(22,3)
Performance Score	PERF_SCORE	2340.35	NUMBER
Bias Factor	BIAS_FACTOR	2340.2	NUMBER
Hydro Spill Indicator	HYDRO_SPILL_IND	4000.67	VARCHAR2(1) See possible values below
Reg Offer Price ($/MWh)	REG_OFFER_PRC	2340.21	NUMBER
RT LMP Used ($/MWh)	RT_LMP_USED	2340.61	NUMBER
Hydro Average LMP ($/MWh)	HYDRO_AVG_LMP	2340.62	NUMBER
Reg Offer Amount ($)	REG_OFFER_AMT	2340.22	NUMBER
Ramp-In Regulation Opportunity Cost ($)	RAMP_IN_REG_OPP_COST	2340.38	NUMBER
Intra-Hour Regulation Opportunity Cost ($)	INTRA_HOUR_REG_OPP_COST	2340.39	NUMBER
Ramp-Out Regulation Opportunity Cost ($)	RAMP_OUT_REG_OPP_COST	2340.4	NUMBER
Regulation Opportunity Cost ($)	REG_OPPORTUNITY_COST	2340.6	NUMBER
Total Regulation Clearing Price Credits ($)	TOT_REG_RMCP_CR	2340.48	NUMBER
Regulation Lost Opportunity Cost Credit ($)	REG_LOST_OPP_CRED	2340.24	NUMBER
Version	VERSION	4000.07	VARCHAR2(12)

Possible Hydro Spill Indicator Values: Y or N

- This report displays the details behind the Hydro Average LMP calculation for Hydro Generation Units.

- The plant availability indicator will only be displayed if the market participant has ownership for all the Hydro units in the plant.

The following columns will appear in the body of the report:

Online and CSV Column Name	XML Column Name	Column Number	Data Type
Customer ID	CUSTOMER_ID	4000.01	INTEGER
Customer Code	CUSTOMER_SHORT	4000.02	VARCHAR2(6)
EPT Hour Ending	EPT_HOUR_ENDING	4000.05	VARCHAR2(40) mm/dd/yyyy HH24 format (Displays first hour of the day as hour 1 and last hour of the day as hour 24)
GMT Hour Ending	GMT_HOUR_ENDING	4000.06	VARCHAR2(40) mm/dd/yyyy HH24 format (Displays first hour of the day as hour 1 and last hour of the day as hour 00 of the following day)
Unit ID	UNIT_ID	4001.63	NUMBER
Unit Name	UNIT_NAME	4000.64	VARCHAR2(75)
Plant Id	PLANT_ID	4000.71	NUMBER
RT Generation MW	RT_GEN_MW	3000.33	NUMBER(12,6)
RT Unit Status	RT_UNIT_STATUS	4000.16	NUMBER(1,0)
Positive MW Threshold	POS_MW_THRESHOLD	4001.75	NUMBER(12,3)
Negative MW Threshold	NEG_MW_THRESHOLD	4001.76	NUMBER(12,3)
On Peak Indicator	ON_PEAK_IND	4000.7	NUMBER(1,0)
RT Generator LMP ($/MWh)	RT_GENERATOR_LMP	3000.25	NUMBER(12,6)
Available Unit Offline Indicator	AVAIL_UNIT_OFFLINE_IND	4000.73	NUMBER(1,0)
Plant Availability Indicator	PLANT_AVAIL_IND	4000.76	NUMBER(1,0)
Version	VERSION	4000.07	VARCHAR2(12)

- ## Regulation Summary

  - Total PJM RMPCP Credits renamed to Total PJM RMMCP Credits

  - RMPCP Charge renamed to RMMCP Charge

  - RMPCP Credit renamed to RMMCP Credit

- ## Generator Credit Summary

  - Reg RMPCP Credit renamed to Reg RMMCP Credit

- ## Generator Portfolio Credit Summary

  - Reg RMPCP Credit renamed to Reg RMMCP Credit

- ## Column numbers will not be changed

	Timeline
Regulation Redesign Settlements Impacts – updates at the MSS	May 2025 / June 2025
MSRS Report Documentation Available	May 2025 / June 2025
MSRS Train (Sandbox) Opens for Testing	July 2025
MSS Informational update on M28 changes	July 2025
Special education sessions covering all Regulation Redesign areas	August 12 / September 5, 2025
Regulation Redesign Phase 1 go-live / MSRS Report changes effective	Oct. 1, 2025 at 00:00
October 2025 Bill Issued (First billing statement containing Phase 1 changes)	November 7, 2025

1	2	3
• Regulation Settlements impacted by Phase 1 of the Regulation Market Redesign initiative effective Oct. 1, 2025 • Phase 2 changes will be effective Oct. 1, 2026	• MSRS Reports available in Sandbox in July • MSRS Reports available in Production beginning with October 2025 Billing Month	• Additional MSRS details at June MSS • Additional communications will be sent to MSS distribution list containing details on sandbox/training availability and documentation updates.

- [Regulation Redesign Phase 1 – Frequently Asked Questions (FAQ)](#)

- [Regulation Redesign Approved Package](#)

- [Regulation Market Design Senior Task Force](#)

- [Regulation Market Design FERC Filing](#)

- [FERC Acceptance](#)

Facilitator:
Susan Kenney,
susan.kenney@pjm.com

Secretary:
Sean Flamm, sean.flamm@pjm.com

SME/Presenter:
Suzanne Coyne & Nick DiSciullo,
Nicholas.disciullo@pjm.com
suzanne.coyne@pjm.com

Regulation Phase 1 Settlements

Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com