



RMDSTF Regulation Requirement

PJM's Proposal Follow-Up

Madalyn Beban, Market Design &
Economics

RMDSTF

May 16, 2023

- Recap proposal from April RMDSTF
 - Minor update to HE definitions
- Discuss proposed annual adjustment methodology
 - Component metrics and mockup
- Discuss Regulation Up/Down translation
 - MW schedule and adjustment logic



Summary of Regulation Requirement Proposal

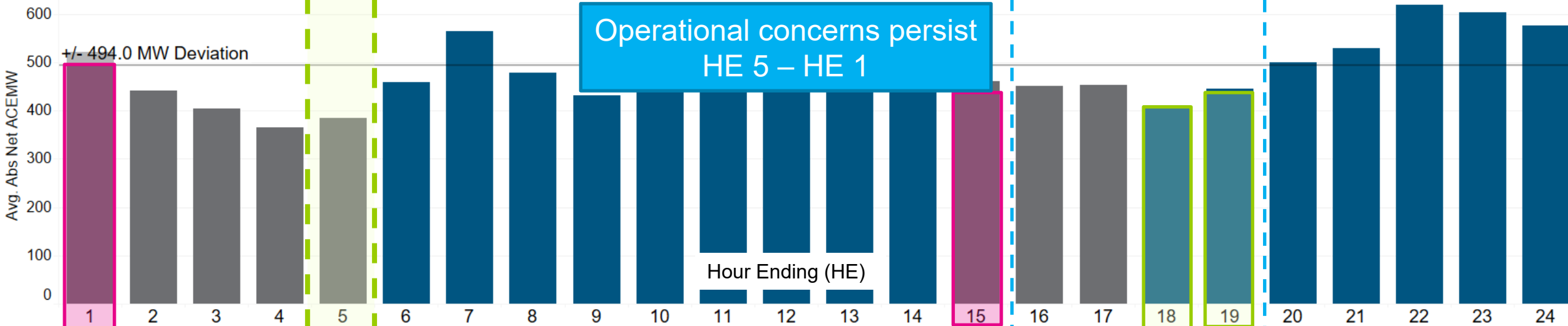
Season	Dates	Hours Ending	Requirement MW
Winter	Nov. 1 – Feb. 28	HE 5 – 10, HE 17 – 24	800
		HE 1 – 4, HE 11 - 16	500
Spring	March 1 - April 30	HE 19 – 1, HE 6 – 9	800
		HE 2 – 5, HE 10 – 18	500
Summer	May 1 – Sept. 15	HE 5 – 15, HE 20 – 1	800
		HE 2 – 4, HE 16 - 19	500
Fall	Sept. 15 – Oct. 31	HE 6 – 9, HE 18 – 24	800
		HE 1 – 5, HE 10 - 17	500



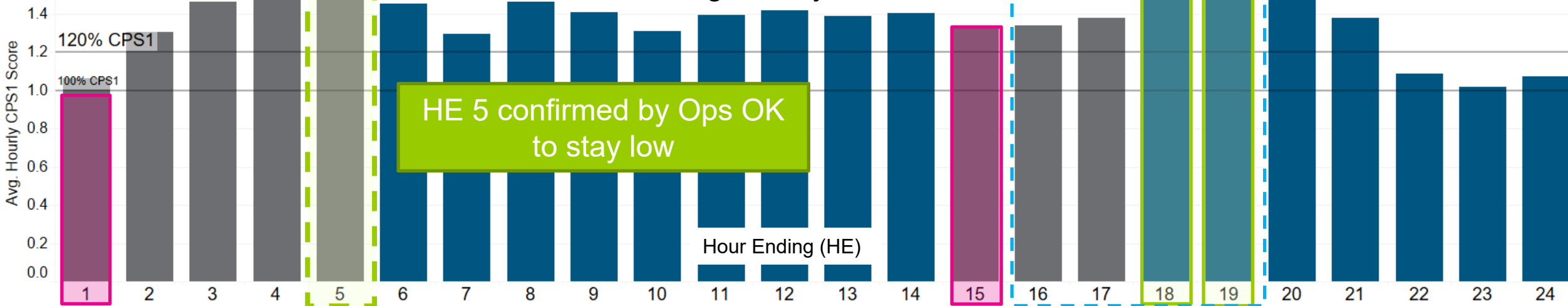
Hourly Definition Shift: Summer

- Status Quo "On Ramp"
- Status Quo "Off Ramp"
- New "High Reg" Hour
- New "Low Reg" Hour

Absolute Net ACE Deviation



Avg. Hourly CPS1





Final Proposal with Modified Summer Hours

Shifted HE definitions to align with hourly tendencies in ACE, CPS, operations experience

Season	Dates	Hours Ending	Requirement MW
Winter	Nov. 1 – Feb. 28	HE 5 – 10, HE 17 – 24	800
		HE 1 – 4, HE 11 – 16	500
Spring	March 1 - April 30	HE 19 – 1, HE 6 – 9	800
		HE 2 – 5, HE 10 – 18	500
Summer	May 1 – Sept. 15	HE 5 – 1	800
		HE 2 – 4	500
Fall	Sept. 15 – Oct. 31	HE 6 – 9, HE 18 – 24	800
		HE 1 – 5, HE 10 – 17	500

- Goal: Codify an annual review of system performance metrics and adjust requirement based on seasonal hourly profiles in past year
- Metrics of interest include:
 - 1. Average Hourly Absolute Net ACE MW Deviations (ACE_{NetDev})**
= Average of $Abs(\text{Net ACE})$ across all 5-min intervals in each hour,
where $\text{Net ACE} = (\text{Control ACE} - \text{REGMW})$ for each interval
 - 2. Hourly CPS1 Scores (CPS)**
 - 3. Average Hourly Reg Utilization Percentages (RU)**
= Average of $(\sum \text{REGMW} / \sum \text{TREG})$ for all 5-min intervals in each hour

1. Collect performance metrics from all hours in each Season-HE group
(ACE_{NetDev}, CPS, RU)
2. Aggregate and apply the following conditions to find requirement adders
 - CPS Adder = -25 MW if CPS > 140% more than 50% of the time
 - CPS Adder = +25 MW if CPS < 120% more than 50% of the time
 - CPS Adder = +50 MW if CPS < 100% more than 25% of the time
 - CPS Adder = 0 MW otherwise

 - ACE Adder = -25 MW if ACE_{NetDev} < +/- 247MW more than 50% of the time
 - ACE Adder = +25 MW if ACE_{NetDev} > +/- 494MW and < +/- 741 MW more than 50% of the time
 - ACE Adder = +50 MW if ACE_{NetDev} > +/- 741 MW more than 50% of the time
 - ACE Adder = 0 MW otherwise



$$\mathbf{Net\ Adder}_{Season,HE} = \mathbf{ACE\ Adder}_{Season,HE} + \mathbf{CPS\ Adder}_{Season,HE}$$

3. Check the net adder's effect against average Season-HE regulation utilization (RU)
 - If average RU supports the net adder, proceed with adjustment
 - If average RU contradicts the net adder, nullify the adjustment



Simple Visualization of Adjustment Framework

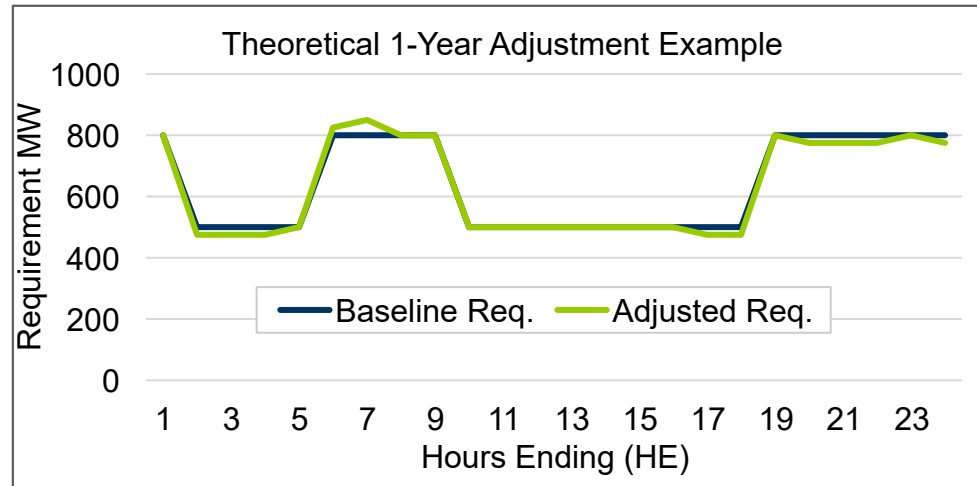
Season	HE	Baseline Req.	ACENetDev Adder	CPS Adder	RU Check	Adjusted Req.
Spring	1	800	0	-25	0	800
Spring	2	500	0	-25	1	475
Spring	3	500	0	-25	1	475
Spring	4	500	0	-25	1	475
Spring	5	500	0	-25	0	500
Spring	6	800	0	25	1	825
Spring	7	800	25	25	1	850
Spring	8	800	0	-25	0	800
Spring	9	800	0	-25	0	800
Spring	10	500	0	-25	0	500
Spring	11	500	0	-25	0	500
Spring	12	500	0	-25	0	500
Spring	13	500	0	-25	0	500
Spring	14	500	0	-25	0	500
Spring	15	500	0	-25	0	500
...

 = Season-Hour lowered
 = Season-Hour raised



Simple Visualization of Adjustment Framework

Season	HE	Baseline Req.	ACENetDev Adder	CPS Adder	RU Check	Adjusted Req.
...
Spring	16	500	0	-25	0	500
Spring	17	500	0	-25	1	475
Spring	18	500	0	-25	1	475
Spring	19	800	0	-25	0	800
Spring	20	800	0	-25	1	775
Spring	21	800	0	-25	1	775
Spring	22	800	0	-25	1	775
Spring	23	800	0	0	0	800
Spring	24	800	0	-25	1	775



- Translation of the discussed requirement to an asymmetric product definition is in line with status quo
 - Recall:* Requirement MW procured today represents a range
 - i.e. 800 MW Requirement translates to +800, -800 range procured
- 800 MW Requirement in future will look like 800 MW Up, 800 MW Down for hours initially classified as high regulation per the requirement table

- ACE metric that feeds the ACE Adder previously described can be split, computed for positive and negative ACE deviations
 - Instead of absolute deviation (+/- from zero), consider direction
- Reg Utilization metric can be split, computed for utilization % in up and down directions
- CPS metric cannot be split but will be retained and applied as in the bidirectional case

Facilitator:
Michael Herman,
michael.herman@pjm.com

Secretary:
Wenzheng Qiu,
Wenzheng.Qiu@pjm.com

SME/Presenter:
Madalyn Beban,
madalyn.beban@pjm.com

PJM RMDSTF Regulation Requirement



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

**PROTECT THE
POWER GRID
THINK BEFORE
YOU CLICK!**



Be alert to
malicious
phishing emails.

Report suspicious email activity to PJM.
(610) 666-2244 / it_ops_ctr_shift@pjm.com

