

## ISSUE CREATION

[Problem Statement](#) and [Issue Charge](#) brought forward by Old Dominion Electric Cooperative, Southern Maryland Electric Cooperative, Delaware Municipal Electric Corporation, American Municipal Power, PJM ICC, Buckeye Power, Northern Virginia Electric Cooperative, Dominion Energy, North Carolina Electric Membership Corporation and approved at the 6/23/2021 Markets and Reliability Committee.

[EPFSTF Charter](#)

## ISSUE SUMMARY

Key Work Activities:

1. Education on the current and pending PJM market rules for use of ORDCs and Transmission Constraint Penalty Factors in LMPs including the input assumptions for the ORDCs. The education will also include pricing rules during emergency actions, triggers for Performance Assessment Intervals (PAI), and the automatic use of the maximum reserve penalty factors.
2. Explore potential “circuit breaker(s)” or other stop loss approach(es) that could limit extreme pricing whose cost likely far exceeds the value of any contribution to preserving grid reliability. The discussion would also include potential additional operational authorities needed by PJM to maintain grid reliability under such conditions.
3. Explore potential enhancements to PJM’s ORDC rules to address the impact of recent changes in PJM’s dispatch protocols on forecast uncertainty embedded within the approved curve shape. Explore, and address as appropriate, the additional market and credit risks of the ORDC changes in light of recent events in ERCOT, SPP, and MISO.

## CONSENSUS-BASED ISSUE RESOLUTION PROCESS

Number of Meetings and date range covering this topic: 19 Meetings, spanning August 2021 to November 2022.

During the ongoing discussion related to the application of a Circuit Breaker, parallel CBIR discussions focused on the Energy Market Circuit Breaker and a Transmission Constraint Penalty Factor (TCPF) Circuit Breaker. EPFSTF discussions dedicated to the Energy Market Circuit Breaker initiated in August 2021, and discussions regarding the TCPF started in April 2022. Both topics had final solution options developed by August 2022 and voted at the Energy Price Formation Senior Task Force in September 2022.

[Non-Binding Poll Results](#)

[MRC Vote Results – December 21, 2022](#)

[Final Matrix – Circuit Breaker](#)

[Final Matrix – Transmission Constraint Penalty Factor](#)

## 1. RECOMMENDED PROPOSAL

**Energy Market Circuit Breaker:** Of the seven packages, no package received 50% simple majority support or greater than 50% preference over status quo.

At the October MRC, ODEC, moved and SMECO seconded a Main Motion for a proposed circuit breaker solution package I. Calpine, moved LS Power, seconded an Alternative Motion for a proposed circuit breaker solution package B.

**Transmission Constraint Penalty Factor Proposal:** Of the two packages, package A received 91% support at the Energy Price Formation Senior Task force and 70% preference over status quo.

## 2. ALTERNATE 1 PROPOSAL

### **Energy Market Circuit Breaker:**

Package I was brought forward as one of two First Reads at the 10/22/2024 MRC.

Circuit Breaker Trigger Attributes:

- Energy price, average total LMP over a defined interval in the RTO or Active Subzone
- PJM Discretion to invoke the circuit breaker methodology during other Emergency Procedures
- PJM shall not have discretion to prevent the circuit breaker
- Both day-ahead and real-time markets may trigger the circuit breaker
- Once triggered, circuit breaker is deployed immediately – next 5-minute interval
- Notification
  - a. Stakeholder email communication
  - b. Addition of circuit breaker Status Icon to PJM Markets & Operations landing page and Data Viewer
  - c. Much like a PAI notice, the circuit breaker will be noticed on the Emergency Procedures page for informational purposes

LMP-Based Circuit Breaker Components

- Total LMP in RTO or Active Subzone is the triggering mechanism
- Trigger level
  - \$1,000/MWh average LMP for any single rolling 24-hour period (aka day)
  - \$850/MWh average LMP for any rolling 168-hour period (aka week)
  - Methodology – administratively cap total LMP at \$850/MWh for the RTO or Active Subzone
  - Settlements - scheduled and committed resources with verified cost offers above the relevant circuit breaker pricing levels would recover costs via current uplift methodology

- Termination – a circuit breaker cap will automatically terminate after 5 business days in the event the circuit breaker cap has not been utilized

[Proposal](#)

### 3. ALTERNATE 2 PROPOSAL

#### **Energy Market Circuit Breaker:**

Package B was brought forward as the second of two First Reads at the 10/22/2024 MRC.

Circuit Breaker Trigger Attributes:

- Event Based Trigger, initially triggered when experienced 90 hours of total shortage events, even if non-consecutive from June 1. Subsequently triggered in the event of 36 hours of consecutive 5-minute intervals of shortage in RT or 3 hours or longer in DA.
- No PJM Discretion to invoke or terminate the circuit breaker methodology
- Both day-ahead and real-time markets may trigger the circuit breaker
- Once triggered, circuit breaker is deployed immediately – next 5-minute interval
- Notification
  - a. Stakeholder email communication
  - b. Addition of circuit breaker Status Icon to PJM Markets & Operations landing page and Data Viewer
  - c. Much like a PAI notice, the circuit breaker will be noticed on the Emergency Procedures page for informational purposes

Circuit Breaker Methodology

- Administratively cap energy component of LMP at \$2,000/MWh , Reserve MCPs would follow status quo capping logic
- Settlements - Generator paid uplift if LMP too low to cover generator dispatched offer.
- Termination – a circuit breaker cap will automatically terminate upon termination of Shortage conditions

### 4. STANDING COMMITTEE RESULTS

#### **Energy Market Circuit Breaker:**

Following discussion the Main Motion (package I) failed in a sector-weighted vote with 2.88 in favor. The Alternate Motion (Package B) also failed in a sector-weighted vote with 1.049 in favor



# Energy Price Formation Senior Task Force (EPFSTF) Final Report

Committee: Markets and Reliability Committee  
Meeting Date: 12/21/2022

**1a.: Do you endorse the proposed Circuit Breaker Main Motion?**

(Voting Result : Failed)

**\*\*This package FAILED.\*\***

Sector	Yes	No	Abstain	Sector Weight In Favor
ED	31	0	1	1
TO	2	6	3	0.25
OS	8	8	0	0.5
GO	3	20	0	0.13
EUC	19	0	0	1
Totals	63	34	4	2.88

**1b.: Do you endorse the proposed Circuit Breaker Alternate Motion?**

(Voting Result : Failed)

**\*\*This package FAILED.\*\***

Sector	Yes	No	Abstain	Sector Weight In Favor
ED	0	29	0	0
TO	1	7	3	0.125
OS	7	5	0	0.583
GO	4	13	0	0.235
EUC	2	17	0	0.105
Totals	14	71	3	1.049

### Transmission Constraint Penalty Factor Proposal

Package A was endorsed by acclamation with one objection and no abstentions at the November 16, 2022 MRC.

## APPENDIX I: SUPPLEMENTAL DOCUMENTS

[Committee Page](#)

[Issue Tracking](#)

## APPENDIX II: PJM PARTICIPATION

Facilitator: Susan Kenney

Secretary: Andrea Yeaton

Advocate: Rebecca Carroll

Subject Matter Expert: Angelo Marcino

Subject Matter Expert: Keyur Patel

Subject Matter Expert: Walter Graf

PJM Legal: Thomas DeVita

## APPENDIX III: STAKEHOLDER PARTICIPATION

### In-Person Meeting Attendees

Name	Company Name	Sector
Kenney, Susan (Facilitator)	PJM Interconnection	None
Yeaton, Andrea (Secretary)	PJM Interconnection	None
Carroll, Rebecca	PJM Interconnection, LLC	None
Chang, Sean	Shell Energy North America (US), L.P.	Other Supplier
Chmielewski, Brian	PJM Interconnection	None
Croop, Danielle	PJM Interconnection	None
Ford, Adrien	Old Dominion Electric Cooperative	Electric Distributor
Kogut, George	New York Power Authority	Other Supplier

### Webex Meeting Attendees

Name	Company Name	Sector
Abramowitz, Jeremy	Monitoring Analytics, LLC	None
Anders, David	PJM Interconnection, LLC	None
Baizman, Aaron	PJM Interconnection, LLC	None
Barker, Jason	Constellation Energy Generation, LLC	Generation Owner
Benchek, Jim	American Transmission Systems, Inc.	Transmission Owner
Bleiweis, Bruce	DC Energy LLC	Other Supplier
Bresler, Stu	PJM Interconnection, LLC	None
Brodbeck, John	EDP Renewables North America, LLC	Generation Owner
Brown, Richard	PJM Interconnection, LLC	None
Bruce, Susan	McNees Wallace & Nurick LLC	None
Bruno, Patrick	PJM Interconnection, LLC	None
Bryson, Michael (Mike)	PJM Interconnection, LLC	None
Canter, David	AEP Appalachian Transmission Company, Inc.	Transmission Owner
Carmean, Gregory	OPSI	None
Chen, Hong	PJM Interconnection, LLC	None
Christopher, Mahila	Public Utilities Commission of Ohio (The)	None
Chu, George	PJM Interconnection, LLC	None
Corash, Richard (Rich)	PSEG Energy Resources & Trade LLC	Other Supplier
Cox, Jason	Dynegy Power Marketing, Inc.	Generation Owner
Coyle, Billy	Dominion Virginia Power	None
Curtis, Kenneth	Drilling Info, Inc.	None
Davis, James (Jim)	Dominion Energy Generation Marketing, Inc.	Generation Owner
Dillon, Matthew	UGI Development Company	Generation Owner



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Downs, Jere	PJM Interconnection, LLC	None
Drom, Richard (Rick)	Eckert Seamans	None
Dugan, Chuck	East Kentucky Power Cooperative, Inc.	Transmission Owner
Elkins, Rachel	FirstEnergy Corporation	Transmission Owner
Fan, Zhenyu	PJM Interconnection, LLC	None
Fereshetian, Damon	PJM Interconnection, LLC	None
Filomena, Guy	Customized Energy Solutions, Ltd.*	None
Fitzpatrick, Brian	PJM Interconnection, LLC	None
Foladare, Kenneth (Ken)	Geenex Solar LLC	Other Supplier
Foster Cronin, Denise	East Kentucky Power Cooperative, Inc.	Transmission Owner
Gates, Terry	AEP Appalachian Transmission Company, Inc.	Transmission Owner
Gorman, Brad	FirstEnergy Corporation	Transmission Owner
Greene III, Benjamin	AEP Appalachian Transmission Company, Inc.	Transmission Owner
Greening, Michele	PJM Interconnection, LLC	None
Guntle, Vince	American PowerNet Management	End-Use Customer
Handlin, Michael	PJM Interconnection, LLC	None
Hastings, David	Market Interconnection Consulting Services (MICS)	None
Hehir, Flannan	Appian Way Energy Partners MidAtlantic, LLC	Other Supplier
Heinle, Frederick (Erik)	Office of the Peoples Counsel for the District of Columbia	End-Use Customer
Hepplewhite, Peter	Wrigley Capital LLC	Other Supplier
Hoatson, Thomas (Tom)	Riverside Generating, LLC	Generation Owner
Hohenshilt, Jennifer	Talen Energy Marketing, LLC	Generation Owner
Horger, Tim	PJM Interconnection, LLC	None
Horning, Lynn Marie	Customized Energy Solutions, Ltd.*	None
Hsia, Eric	PJM Interconnection, LLC	None
Hyzinski, Tom	GT Power Group	None
Janicki, Diane	Boston Energy Trading & Marketing, LLC	Other Supplier
Johnson, Carl	Customized Energy Solutions, Ltd.*	None
Johnston, David	Indiana Utility Regulatory Commission	None
Jones, Scott	Indiana Office of Utility Consumer Counsel	End-Use Customer
Keech, Adam	PJM Interconnection, LLC	None
Kelly, Stephen	Brookfield Energy Marketing LP	Other Supplier
Liang-Nicol, Cecilia	Monongahela Power Company d/b/a Allegheny Power	Transmission Owner
Libbos, Robin	FirstEnergy Corporation	Transmission Owner
Lu, Chenchao (Chen)	PJM Interconnection, LLC	None
Mabry, David	McNees Wallace & Nurick LLC	None
Marcino, Angelo	PJM Interconnection, LLC	None



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Mason, Gary	FirstEnergy Corporation	Transmission Owner
Matheson, Eric	Pennsylvania Public Utility Commission	None
McNicholas, Daniel	#REF!	#REF!
Midgley, Sharon	Exelon Business Services Company, LLC	Transmission Owner
Moye, Bob	Rainbow Energy Marketing Corporation	Other Supplier
Murray, Kevin	McNees Wallace & Nurick LLC	None
Neubrandner, Kerry	DC Energy Mid-Atlantic, LLC	Other Supplier
O'Connor, Siobhan	Energy Authority, Inc. (The)	Other Supplier
Okenfuss, James	Savion, LLC	None
Ondayko, Brock	AEP Appalachian Transmission Company, Inc.	Transmission Owner
Pakela, Gregory (Greg)	DTE Energy Trading, Inc.	Other Supplier
Patel, Keyurbhai (Keyur)	PJM Interconnection, LLC	None
Pilong, Christopher	PJM Interconnection, LLC	None
Poulos, Greg	CAPS	None
Price, Mark	DC Energy Mid-Atlantic, LLC	None
Robinson, Becky	Vista Energy Marketing, L.P.	Other Supplier
Rogers, Aaron	East Kentucky Power Cooperative, Inc.	Transmission Owner
Rohrbach, John	Southern Maryland Electric Cooperative, Inc.	Electric Distributor
Rutledge, Craig	AEP Appalachian Transmission Company, Inc.	Transmission Owner
Sasser, Jonathan	Customized Energy Solutions, Ltd.*	None
Scarpignato, David (Scarp)	Calpine Energy Services, L.P.	Generation Owner
Schwarz, Stephanie	PJM Interconnection, LLC	None
Servera, Max	Unicia Energy LP	Other Supplier
Shah, Vijay	PJM Interconnection, LLC	None
Shanker, Roy	H.Q. Energy Services (U.S.), Inc.	Other Supplier
Smith, Kara	Buckeye Power, Inc.	Electric Distributor
Sotkiewicz, Paul	E-Cubed Policy Associates	None
Stern, Alexander (Alex)	Public Service Electric & Gas Company	Transmission Owner
Sturgeon, John	Duke Energy Carolinas, LLC	Other Supplier
Suh, Jung	Calpine Energy Services, L.P.	Generation Owner
Sussler, Philip	State of Maryland	None
Swalwell, Brad	Tangent Energy Solutions, Inc.	Other Supplier
Sweeney, Rory	GT Power Group	None
Tan, Tiffany	Pennsylvania Public Utility Commission	None
Tribulski, Jennifer (Jen)	PJM Interconnection, LLC	None
Tutino, Joseph	PJM Interconnection, LLC	None
Tyler, Catherine	Monitoring Analytics, LLC	None
VanBlargan, Bryna	Resource Investments	None



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Warshel, Kim	PJM Interconnection, LLC	None
Whitehead, Jeffrey (Jeff)	GT Power Group	None
Zhang, Michael (Mike)	PJM Interconnection, LLC	None