

**Markets and Reliability Committee**  
**The Chase Center, Wilmington, DE**  
**March 21, 2019**  
**9:00 a.m. – 11:50 a.m. EPT**

## Administration (9:00-9:10)

Ms. Suzanne Daugherty and Mr. Dave Anders welcomed stakeholders and provided the Anti-trust and Code of Conduct announcements.

Mr. Stu Bresler discussed the status of the 2022/2023 Base Residual Auction scheduled to be run in 2019. Mr. Bresler noted the FERC finding in that the current rules for the auction are not just and reasonable, and that the FERC has not acted upon PJM's related compliance filing. He discussed potential options including:

- Request that FERC approve a further delay of the auction schedule
- Request that FERC approve executing the auction with existing rules
- Make a Section 205 filing with an alternative rate to be used for this auction only

Mr. Bresler invited stakeholder input and recommendations. Mr. Bresler also solicited feedback regarding PJM's intent to suspend collecting data required to support PJM's proposal at FERC in the MOPR docket.

## Consent Agenda (9:10-9:20)

Items A through D were **approved/endorsed** by acclamation with no objections or abstentions.

- A. Draft minutes of the February 21, 2019 meeting of the Markets and Reliability Committee (MRC).
- B. Proposed revisions to Manual 13: Emergency Operations updated to reflect language in the new version of NERC EOP-004-4 and more accurately reflect OE-417 requirements.
- C. Proposed revisions to Manual 20 Resource Adequacy Analysis resulting from a periodic cover-to-cover review, removing outdated references, and updating references to ReliabilityFirst's standards.
- D. Proposed revisions to Manual 37: Reliability Coordination resulting from a periodic cover-to-cover review and incorporating an updated Appendix D.

## Endorsements/Approvals (9:20-10:00)

### 1. Deficiency Cure Periods (9:20-9:30)

Ms. Susan McGill presented updates to Manual 14A: New Services Request Process and the OATT associated with deficiency cure periods at the end of the queue and identify potential areas of improvement. Following discussion the committee **endorsed** the proposed revisions by acclamation with no objections or abstentions.

## 2. Fuel Security Problem Statement and Issue Charge (9:30-10:00)

Mr. Tim Horger reviewed the proposed Fuel Security problem statement and issue charge, including the posted “compromise” update. Mr. Erik Heinle, DC Office of the Peoples’ Counsel, discussed the proposed alternate Energy Security problem statement and issue charge, noting that PJM had addressed their concerns in the proposed compromise update. Mr. Heinle withdrew the proposed alternate problem statement and issue charge.

Ms. Marji Philips, Direct Energy, proposed a friendly amendment to change the Expected Duration of Work Timeline as follows:

The activities of the group are expected to begin in April 2019, ~~and be completed by the end of 2019.~~ By the end of the 3rd quarter 2019 the group will complete key work activities #1 - #3 and expected deliverable #1 and will report to the MRC their recommendations. ~~The remainder of the key work activities and deliverables will be completed by the end of 2019.~~ **At that time the MRC will establish the timeline for completion of the remaining work activities and deliverables to be completed no later than June 1, 2020.** This will be a high priority issue and will meet a minimum of once per month.

Mr. Horger indicated that this was considered friendly, and therefore it was incorporated into the proposed issue charge.

Mr. Bob O’Connell, Panda, moved an alternate issue charge which added/modified the following Key Work Activities:

2. Quantify via study the probability of occurrence of any scenario that might present a risk of fuel insecurity.
6. Analyze and quantify the market responses to any conditions that could lead to fuel insecurity identified in 4 above
7. Assess whether is the current market construct is sufficient to cure the energy/fuel insecurity identified in 4 above.
9. Determine and compare potential mechanisms, ~~including costs,~~ to ensure and value fuel/energy security **and their associated costs and benefit to cost ratio** in PJM and consider recommendations from relevant studies and assessments that are technically feasible.

Mr. O’Connell’s proposed alternate issue charge modified the Deliverables as follows:

1. A recommendation to the MRC on whether market or operational changes are needed to ensure current or future fuel/energy security **if any are needed.**
3. Revisions to the Operating Agreement, Open Access Transmission Tariff, and manuals to implement the recommended enhancements **if any are needed.**

Additionally, Mr. O’Connell’s proposed alternate issue charge modified the Expected Duration of Work Timeline as follows:

The activities of the group are expected to begin in April 2019, and be completed by the end of **August of 2020**~~2019.~~ ~~By the end of the 3rd quarter 2019 the group will complete key work activities~~

~~#1 – #3 and expected deliverable #1 and will report to the MRC their recommendations. The remainder of the key work activities and deliverables will be completed by the end of 2019. This will be a high priority issue and will meet a minimum of once per month.~~

Ms. Daugherty ruled that the motion was out of order, as problem statements and issue charges may be offered by a Member, PJM or the IMM without a motion or second being required by a Member. She added that Mr. O’Connell’s proposed issue charge could be offered as an alternate motion that would be voted upon should the compromise motion fail. Mr. O’Connell moved and Ms. Ruth Price seconded an appeal of the decision of the Chair. Following discussion the appeal of the decision of the Chair failed in a sector-weighted vote with 0.98 in favor.

Mr. David Scarpignato, Calpine, proposed a friendly amendment to change “Fuel/Energy” to Fuel/Energy/Resource” throughout both the proposed compromise issue charge. Mr. Horger and Mr. Heinle indicated that this was considered friendly, and therefore it was incorporated into the proposed compromise issue charge.

Mr. Horger presented an updated compromise issue charge incorporating the elements of the original compromise issue charge and Mr. O’Connell’s proposed alternate issue charge. He indicated that this had the support of PJM. Mr. Heinle and Mr. O’Connell also indicated their support.

Following discussion the committee **approved** the proposed problem statement and updated compromise issue charge by acclamation with one objection and one abstention.

## First Readings (10:00-11:35)

### 3. PJM Manuals (10:00-10:20)

- A. Ms. Andrea Yeaton reviewed updates to Manual 11: Energy & Ancillary Services Market Operations due to addition of location fields in DR Hub. The committee will be asked to endorse these revisions at its next meeting.
- B. Ms. Susan Kenney reviewed updates to Manual 11: Energy & Ancillary Services Market Operations as part of the biennial review. The committee will be asked to endorse these revisions at its next meeting.
- C. Mr. Jerry Bell and Patricio Rocha-Garrido presented proposed revisions to Manual 21: Rules & Procedures for Determination of Generating Capability, including the revisions from the recent ELCC Analysis discussions. The committee will be asked to endorse these revisions at its next meeting.

### 4. Must Offer Exception Process (10:20-10:45)

- A. Mr. Pat Bruno provided a second first read of the MRC main motion for the Must Offer Exception Process and provided a update of Market Implementation Committee (MIC) activities.
- B. Ms. Sharon Midgley, Exelon, reviewed an alternate proposal endorsed by the MIC at its March meeting.

The committee will be asked to endorse the main motion and any alternate proposals at its next meeting.

5. PJM Transmission Service and Merchant Facility Business Practices Update (10:45-10:55)

- A. Mr. Chris Advena provided a first read on the revisions to the PJM Regional Business Practices document associated with the new OASIS application. The committee will be asked to endorse these revisions at its next meeting.
- B. Mr. Advena also provided an informational update on the corresponding changes to the Merchant Facilities Practices document also associated with the new OASIS.

6. Market Efficiency Process Enhancement Task Force (10:55-11:05)

Mr. Brian Chmielewski presented the Market Efficiency phase 2 proposal developed at the Market Efficiency Process Enhancement Task Force (MEPETF) and the associated proposed Manual and Operating Agreement revisions. The Committee will be asked to endorse the proposal and proposed revisions at its next meeting.

7. FTR Forfeiture Hourly Component (11:05-11:20)

Mr. Brian Chmielewski provided a first read to address an issue identified in the FTR Forfeiture hourly cost component calculations. The proposed solution will also be presented. The committee will be asked to endorse these revisions at its next meeting.

8. Carbon Pricing Problem Statement / Issue Charge (11:20-11:35)

Mr. Michael Borgatti, Gable Associates, presented a proposed problem statement and issue charge related to carbon pricing. The Committee will be asked to endorse these documents at its next meeting.

**Informational Updates (11:35-11:50)**

9. Gas Contingency Compensation (11:35-11:50)

Mr. Thomas DeVita provided an informational update on next steps related to the FERC Order ER19-664 and reviewed the Emergency Operating Instruction Compensation problem statement and issue charge.

**Future Agenda Items (11:50)**

**Future Meeting Dates**

|                |           |                  |
|----------------|-----------|------------------|
| April 25, 2019 | 9:00 a.m. | Valley Forge, PA |
| May 30, 2019   | 9:00 a.m. | Valley Forge, PA |
| June 27, 2019  | 9:00 a.m. | Wilmington, DE   |

|                    |           |                  |
|--------------------|-----------|------------------|
| July 25, 2019      | 9:00 a.m. | Wilmington, DE   |
| August 22, 2019    | 9:00 a.m. | Wilmington, DE   |
| September 26, 2019 | 9:00 a.m. | Valley Forge, PA |
| October 31, 2019   | 9:00 a.m. | Wilmington, DE   |
| December 5, 2019   | 9:00 a.m. | Wilmington, DE   |
| December 19, 2019  | 9:00 a.m. | Valley Forge, PA |

Author: D.A. Anders

### Chair & Secretary

|           |         |                     |     |
|-----------|---------|---------------------|-----|
| Daugherty | Suzanne | PJM Interconnection | N/A |
| Anders    | David   | PJM Interconnection | N/A |

### Voting Members

| Last Name | First Name | Organization                                      | Sector               |
|-----------|------------|---|----------------------|
| Ament     | Todd       | Cube Hydro Partners, LLC                          | Generation Owner     |
| Barker    | Jason      | Exelon Business Services Company, LLC             | Transmission Owner   |
| Benchek   | Jim        | American Transmission Systems, Inc.               | Transmission Owner   |
| Bleiweis  | Bruce      | DC Energy, LLC                                    | Other Supplier       |
| Borgatti  | Michael    | Carolina Solar Energy III, LLC                    | Other Supplier       |
| Borgatti  | Michael    | Covanta Energy Group, LLC                         | Generation Owner     |
| Borgatti  | Michael    | Edgecombe Genco, LLC                              | Generation Owner     |
| Borgatti  | Michael    | Hazleton Generation, LLC                          | Generation Owner     |
| Borgatti  | Michael    | Jersey Green Energy, LLC                          | Other Supplier       |
| Borgatti  | Michael    | Longview Power, LLC                               | Generation Owner     |
| Borgatti  | Michael    | Moxie Freedom LLC                                 | Generation Owner     |
| Borgatti  | Michael    | Newark Energy Center, LLC                         | Generation Owner     |
| Borgatti  | Michael    | NextEra Energy Marketing, LLC                     | Other Supplier       |
| Borgatti  | Michael    | York County Solid Waste and Refuse Authority      | Generation Owner     |
| Bruce     | Susan      | Air Products & Chemicals, Inc.                    | End-Use Customer     |
| Bruce     | Susan      | ArcelorMittal USA LLC                             | End-Use Customer     |
| Bruce     | Susan      | Gerdau Ameristeel Energy, Inc.                    | Other Supplier       |
| Bruce     | Susan      | Industrial Energy Users-Ohio                      | Other Supplier       |
| Bruce     | Susan      | Kimberly-Clark Corporation                        | Generation Owner     |
| Bruce     | Susan      | Lehigh Portland Cement Company                    | End-Use Customer     |
| Bruce     | Susan      | Letterkenny Industrial Development Authority - PA | Electric Distributor |

|            |          |   |                      |
|------------|----------|---|----------------------|
| Bruce      | Susan    | Linde, LLC                                    | End-Use Customer     |
| Bruce      | Susan    | MeadWestvaco Corporation                      | End-Use Customer     |
| Bruce      | Susan    | Praxair, Inc.                                 | End-Use Customer     |
| Bruce      | Susan    | Procter & Gamble Paper Products Company (The) | Generation Owner     |
| Bruce      | Susan    | Trustees of the University of Pennsylvania    | End-Use Customer     |
| Bruce      | Susan    | Wellsboro Electric Company                    | Electric Distributor |
| Campbell   | Bruce    | MidAtlantic Power Partners, LLC               | Other Supplier       |
| Canter     | David    | Appalachian Power Company                     | Transmission Owner   |
| Chocarro   | Iker     | E.ON Climate & Renewables North America Inc.  | Generation Owner     |
| Davis      | James    | Virginia Electric & Power Company             | Transmission Owner   |
| Dugan      | Chuck    | East Kentucky Power Cooperative, Inc.         | Transmission Owner   |
| Evrard     | David    | Pennsylvania Office of Consumer Advocate      | End-Use Customer     |
| Fitch      | Neal     | NRG Power Marketing, LLC                      | Generation Owner     |
| Foladare   | Kenneth  | Geenex Solar LLC                              | Generation Owner     |
| Ford       | Adrien   | Old Dominion Electric Cooperative             | Electric Distributor |
| Garnett    | Bryan    | Duke Energy Business Services LLC             | Transmission Owner   |
| Greiner    | Gary     | Public Service Electric & Gas Company         | Transmission Owner   |
| Hastings   | David    | Northstar Trading Ltd.                        | Other Supplier       |
| Hastings   | David    | Saracen Energy East, L.P.                     | Other Supplier       |
| Hastings   | David    | SESCO Enterprises, LLC                        | Other Supplier       |
| Hastings   | David    | Solios Power Mid-Atlantic Trading, LLC        | Other Supplier       |
| Helms      | Joseph   | Rainbow Energy Marketing Corporation          | Other Supplier       |
| Hoatson    | Tom      | Renaissance Power & Gas, Inc.                 | Other Supplier       |
| Hoatson    | Tom      | Riverside Generating, LLC                     | Generation Owner     |
| Hoatson    | Tom      | West Deptford Energy, LLC                     | Generation Owner     |
| Hohenshilt | Jennifer | Talen Energy Marketing, LLC                   | Generation Owner     |
| Horstmann  | John     | Dayton Power & Light Company (The)            | Transmission Owner   |
| Horton     | Dana     | Appalachian Power Company                     | Transmission Owner   |
| Huang      | James    | Rockland Electric Company                     | Transmission         |

|           |         |  | Owner                |
|-----------|---------|--|----------------------|
| Hyzinski  | Thomas  | Dynegy Marketing and Trade, LLC                      | Generation Owner     |
| Hyzinski  | Thomas  | GenOn Energy Management, LLC                         | Generation Owner     |
| Jens      | Tom     | Black Oak Capital, LLC                               | Other Supplier       |
| Johnson   | Carl    | Allegheny Electric Cooperative, Inc.                 | Electric Distributor |
| Johnson   | Carl    | American Municipal Power, Inc.                       | Electric Distributor |
| Johnson   | Carl    | Blue Ridge Power Agency, Inc.                        | Electric Distributor |
| Johnson   | Carl    | Borough of Chambersburg                              | Electric Distributor |
| Johnson   | Carl    | Borough of Mont Alto, Pennsylvania                   | Electric Distributor |
| Johnson   | Carl    | Buckeye Power, Inc.                                  | Electric Distributor |
| Johnson   | Carl    | Central Virginia Electric Cooperative                | Electric Distributor |
| Johnson   | Carl    | City of Dover, Delaware                              | Electric Distributor |
| Johnson   | Carl    | Delaware Municipal Electric Corporation, Inc.        | Electric Distributor |
| Johnson   | Carl    | Easton Utilities Commission                          | Electric Distributor |
| Johnson   | Carl    | Energy Cooperative Association of Pennsylvania (The) | Other Supplier       |
| Johnson   | Carl    | Galt Power, Inc.                                     | Other Supplier       |
| Johnson   | Carl    | Hagerstown Light Department                          | Electric Distributor |
| Johnson   | Carl    | Illinois Municipal Electric Agency                   | Electric Distributor |
| Johnson   | Carl    | Indiana Municipal Power Agency                       | Generation Owner     |
| Johnson   | Carl    | Madison Gas & Electric Co.                           | Other Supplier       |
| Johnson   | Carl    | North Carolina Electric Membership Corporation       | Electric Distributor |
| Johnson   | Carl    | North Carolina Municipal Power Agency Number 1       | Other Supplier       |
| Johnson   | Carl    | Northern Illinois Municipal Power Agency             | Electric Distributor |
| Johnson   | Carl    | Northern Virginia Electric Cooperative (NOVEC)       | Electric Distributor |
| Johnson   | Carl    | Old Dominion Electric Cooperative                    | Electric Distributor |
| Johnson   | Carl    | Thurmont Municipal Light Company                     | Electric Distributor |
| Johnson   | Carl    | Town of Williamsport (The)                           | Electric Distributor |
| Johnson   | Carl    | WPPI Energy  | Other Supplier       |
| Kauffman  | Brian   | Enel X North America, Inc.                           | Other Supplier       |
| Keenan    | Matthew | Elwood Energy, LLC                                   | Generation Owner     |
| Kelly     | Stephen | Brookfield Energy Marketing LP                       | Other Supplier       |
| Kilgallen | Kevin   | Avangrid Renewables, LLC                             | Generation Owner     |
| Kilgallen | Kevin   | EDP Renewables North America, LLC                    | Generation Owner     |

| Kogut       | George  | New York Power Authority  | Other Supplier       |
|-------------|---------|---|----------------------|
| Lieberman   | Steven  | American Municipal Power, Inc.  | Electric Distributor |
| Litchfield  | Matt    | CPV Power Holdings, LP  | Generation Owner     |
| Melnyk      | Markian | Atlantic Grid Operations A, LLC   | Other Supplier       |
| O'Connell   | Robert  | PPGI Fund A/B Development, LLC.   | Generation Owner     |
| Pakula      | Maggie  | Invenergy, LLC  | Generation Owner     |
| Pelletier   | Eveline | H.Q. Energy Services (U.S.), Inc.   | Other Supplier       |
| Philips     | Marji   | Direct Energy Business, LLC   | Other Supplier       |
| Picardi     | Matthew | Shell Energy North America (US), L.P.   | Other Supplier       |
| Poulos      | Greg    | Consumer Protection and Advocate Division of the Tennessee Attorney General                     | End-Use Customer     |
| Poulos      | Greg    | Delaware Division of the Public Advocate  | End-Use Customer     |
| Poulos      | Greg    | Illinois Citizen Utility Board  | End-Use Customer     |
| Poulos      | Greg    | Indiana Office of Utility Consumer Counselor (IN OUCC)  | End-Use Customer     |
| Poulos      | Greg    | Maryland Office of People's Counsel   | End-Use Customer     |
| Poulos      | Greg    | Michigan Department of Attorney General, Environment, Natural Resources, & Agriculture Division | End-Use Customer     |
| Poulos      | Greg    | New Jersey Division of Rate Counsel   | End-Use Customer     |
| Poulos      | Greg    | Office of the Attorney General, Kentucky  | End-Use Customer     |
| Poulos      | Greg    | Office of the People's Counsel for the District of Columbia                                     | End-Use Customer     |
| Poulos      | Greg    | Ohio Consumers' Counsel   | End-Use Customer     |
| Poulos      | Greg    | North Carolina Utilities Commission   | End-Use Customer     |
| Poulos      | Greg    | Virginia Division of Consumer Counsel   | End-Use Customer     |
| Poulos      | Greg    | West Virginia Consumer Advocate Division  | End-Use Customer     |
| Prokop      | Brenda  | ITC Interconnection LLC   | Transmission Owner   |
| Rohrbach    | John    | Kentucky Municipal Energy Agency  | Other Supplier       |
| Rohrbach    | John    | Southern Maryland Electric Cooperative, Inc.  | Electric Distributor |
| Rohrbach    | John    | Wabash Valley Power Association, Inc.   | Electric Distributor |
| Scarpignato | David   | Calpine Energy Services, L.P.   | Generation Owner     |
| Swalwell    | Bradley | Tangent Energy Solutions, Inc.  | Other Supplier       |



|           |         |   |                       |
|-----------|---------|---|-----------------------|
| Thomas    | Amber   | PPL Electric Utilities Corporation<br>d/b/a PPL Utilities | Transmission<br>Owner |
| Vayda     | Brian   | Borough of Butler, Butler Electric<br>Division            | Electric Distributor  |
| Vayda     | Brian   | Borough of Lavallette, New Jersey                         | Electric Distributor  |
| Vayda     | Brian   | Borough of Madison, New Jersey                            | Electric Distributor  |
| Vayda     | Brian   | Borough of Milltown, New Jersey                           | Electric Distributor  |
| Vayda     | Brian   | Borough of Park Ridge, New Jersey                         | Electric Distributor  |
| Vayda     | Brian   | Borough of Pemberton, New Jersey                          | Electric Distributor  |
| Vayda     | Brian   | Borough of Seaside Heights, New<br>Jersey                 | Electric Distributor  |
| Vayda     | Brian   | Borough of South River, New Jersey                        | Electric Distributor  |
| Vayda     | Brian   | Vineland Municipal Electric Utility                       | Electric Distributor  |
| Wadsworth | Joe     | Vitol Inc.  | Other Supplier        |
| Whitehead | Jeffrey | Eastern Generation, LLC                                   | Generation Owner      |
| Whitehead | Jeffrey | Essential Power Rock Springs, LLC                         | Transmission<br>Owner |
| Whitehead | Jeffrey | Wheelabrator Frackville Energy Co.,<br>Inc.               | Generation Owner      |
| Wicks     | Tonja   | Duquesne Light Company                                    | Transmission<br>Owner |

### Non-Voting Participants

| Last Name  | First Name | Organization                                      | Sector                |
|------------|------------|---|-----------------------|
| Abend      | Erik       | Erik Abend Consulting                             | N/A                   |
| Anderson   | Jared      | Platts  | N/A                   |
| Bagot      | Nancy      | Electric Power Supply Association                 | N/A                   |
| Bainbridge | Tom        | FirstEnergy                                       | Transmission<br>Owner |
| Bayless    | Charles    | North Carolina Electric Membership<br>Corporation | Electric Distributor  |
| Benson     | Ed         | NextEra Energy Marketing, LLC                     | Other Supplier        |
| Bockhorn   | Tim        | AES   | Generation Owner      |
| Bowring    | Joe        | Monitoring Analytics                              | N/A                   |
| Boyle      | Stephen    | Merion Energy Solutions                           | N/A                   |
| Branch     | John       | Saint Joseph Energy Center                        | N/A                   |
| Brodbeck   | John       | EDP Renewables North America, LLC                 | Generation Owner      |
| Cadore     | Zoe        | American Petroleum Institute (API)                | N/A                   |

|              |           |  |                      |
|--------------|-----------|--|----------------------|
| Canter       | David     | Appalachian Power Company                | Transmission Owner   |
| Carmean      | Gregory   | OPSI                                     | N/A                  |
| Chandler     | Kent      | Kentucky Office Of The Attorney General  | End-Use Customer     |
| Chen         | Jennifer  | Duke University                          | N/A                  |
| Chineapalli  | Raj       | BP Energy Company                        | Other Supplier       |
| Chintapalli  | Raj       | BP Energy Company                        | Other Supplier       |
| Chocarro     | Iker      | Eon Climate And Renewables               | Generation Owner     |
| Clemence     | Walter    | NextEra Energy Marketing, LLC            | Other Supplier       |
| Colbert      | Cathleen  | NRG Power Marketing, LLC                 | Other Supplier       |
| Cocco        | Michael   | Old Dominion Electric Cooperative        | Electric Distributor |
| Crystle      | Gil       | UGI Energy Services                      | Other Supplier       |
| Dalessandris | Lou       | FirstEnergy                              | Transmission Owner   |
| Dasher       | Brett     | The Energy Authority                     | Other Supplier       |
| Delaney      | Liz       | Environmental Defense Fund               | N/A                  |
| Delosa       | Joe       | New Jersey Board Of Public Utilities     | N/A                  |
| Dennis       | Jeff      | Advanced Energy Economy                  | N/A                  |
| Depillo      | Ray       | Public Service Electric & Gas Company    | Transmission Owner   |
| Dillon       | Matt      | UGI Development                          | Generation Owner     |
| Domian       | Christin  | Duquesne Light Company                   | Transmission Owner   |
| Evrard       | David     | Pennsylvania Office Of Consumer Advocate | End-Use Customer     |
| Farnsworth   | Byron     | Wellsboro Electric Company               | Electric Distributor |
| Fazio        | Danielle  | Englehart                                | Other Supplier       |
| Filomena     | Guy       | Customized Energy Solutions, Ltd.*       | None                 |
| Fink         | Sari      | American Wind Energy Association         | N/A                  |
| Fuess        | Christian | PBF Power Marketing, LLC                 | Generation Owner     |
| Fuller       | Daniel    | BTD Partners                             | N/A                  |
| Gardner      | Michelle  | NextEra Energy Marketing, LLC            | Other Supplier       |
| Garnett      | Bryan     | Duke Energy Business Services LLC        | Transmission Owner   |
| Garza        | Mark      | FirstEnergy                              | Transmission Owner   |
| George       | Brian     | American Petroleum Institute (API)       | N/A                  |
| Gilani       | Rehan     | Con Edison Energy                        | Other Supplier       |
| Gramlich     | Rob       | Grid Strategies, LLC                     | N/A                  |
| Guntle       | Vince     | UGI Energy Services                      | Other Supplier       |

|             |           |   |                      |
|-------------|-----------|---|----------------------|
| Hart        | Craig     | Avenue Capital  | N/A                  |
| Hastings    | David     | Mics  | N/A                  |
| Hayik       | Seth      | Monitoring Analytics  | N/A                  |
| Heidorn     | Richard   | RTO Insider   | N/A                  |
| Heinle      | Erik      | Office of the People's Counsel for the District of Columbia | End-Use Customer     |
| Heisey      | Bradley   | Tenaska   | Generation Owner     |
| Holdbrook   | Ruth      | NOVEC   | Electric Distributor |
| Horning     | Lynn      | Customized Energy Solutions, Ltd.*                          | None                 |
| Horton      | Dana      | Appalachian Power Company                                   | Transmission Owner   |
| Hudis       | Gabriella | Gabel Associates  | N/A                  |
| Huntoon     | Steve     | Chesapeake Transmission                                     | Other Supplier       |
| Hurwich     | Mark      | Elliott Bay Energy Trading, LLC                             | Other Supplier       |
| Hyzinski    | Tom       | GT Power Group  | N/A                  |
| Jacobs      | Mike      | UCS   | N/A                  |
| Jagtiani    | Patricia  | NGSA  | N/A                  |
| Janicki     | Diane     | Boston Energy Trading And Marketing                         | Generation Owner     |
| Janssen     | Robert    | Kelson Energy   | N/A                  |
| Janssen     | Bonnie    | Michigan Public Service Commission                          | N/A                  |
| Jens        | Tom       | Black Oak Capital, LLC                                      | Other Supplier       |
| Jett        | William   | Duke Energy Business Services LLC                           | Transmission Owner   |
| Johnston    | David     | Indiana Utility Regulatory Commission                       | N/A                  |
| Kozhuharov  | Dimitar   | Delaware Public Service Commission                          | N/A                  |
| Kumar       | Nikhil    | SIG   | Other Supplier       |
| Kupcinski   | Candice   | Pepco Holdings  | N/A                  |
| Laios       | Takis     | Appalachian Power Company                                   | Transmission Owner   |
| Liang-Nicol | Cecilia   | FirstEnergy   | Transmission Owner   |
| Logan       | Sharon    | FERC  | N/A                  |
| Lowe        | Connie    | Dominion Energy   | Generation Owner     |
| Martin      | Valerie   | FERC  | N/A                  |
| Matuszak    | Alex      | UGI Energy Services   | Other Supplier       |
| Melnyk      | Markian   | Atlantic Grid Operations A, LLC                             | Other Supplier       |
| Mendelsohn  | Mark      | ETCP  | N/A                  |
| Merola      | Becky     | Calpine Solutions   | Generation Owner     |
| Metzler     | Jakob     | CCI   | CCO                  |
| Midgley     | Sharon    | Exelon Business Services Company,                           | Transmission         |

|            |           | LLC   | Owner                 |
|------------|-----------|---|-----------------------|
| Munsch     | Kristin   | Illinois Citizen Utility Board                            | End-Use Customer      |
| Nadel      | Steven    | PPL Electric Utilities Corporation<br>d/b/a PPL Utilities | Transmission<br>Owner |
| Nallan     | Dwarakesh | Daymark Energy Advisors                                   | N/A                   |
| Nawaz      | Zainab    | New Jersey Board Of Public Utilities                      | N/A                   |
| Niewer     | Sharon    | ATSI  | Transmission<br>Owner |
| Nowell     | Cynthia   | Potomac Electric Power Co                                 | Electric Distributor  |
| O'Boyle    | Brian     | Rockland Electric Company                                 | Transmission<br>Owner |
| Ondayko    | Brock     | Appalachian Power Company                                 | Transmission<br>Owner |
| Pelletier  | Eveline   | HQ Energy Services  | Other Supplier        |
| Peoples    | John      | Duquesne Light Company                                    | Transmission<br>Owner |
| Phillips   | Jennifer  | C.P. Crane  | Generation Owner      |
| Poulos     | Greg      | CAPS  | N/A                   |
| Price      | Ruth Ann  | Delaware Division of the Public<br>Advocate               | End-Use Customer      |
| Quier      | David     | PPL Electric Utilities Corporation<br>d/b/a PPL Utilities | Transmission<br>Owner |
| Rayhorn    | Caroline  | Communion Energy  | Other Supplier        |
| Redwine    | Arlo      | FERC  | N/A                   |
| Roberts    | Casey     | Sierra Club   | N/A                   |
| Robins     | Pip       | EMC Development Company                                   | Other Supplier        |
| Rutigliano | Tom       | NRDC  | N/A                   |
| Salanek    | Alexandra | Monitoring Analytics                                      | N/A                   |
| Sasser     | Jonathan  | Customized Energy Solutions, Ltd.*                        | None                  |
| Schreim    | Morris    | Maryland Public Service Commission                        | N/A                   |
| Sealaus    | Timothy   | EMC Development Company                                   | Other Supplier        |
| Segner     | Sharon    | LS Power  | N/A                   |
| Seide      | Richard   | Apex Clean Energy   | N/A                   |
| Shah       | Pulin     | Exelon Business Services Company,<br>LLC                  | Transmission<br>Owner |
| Shanker    | Roy       | East Coast Power  | N/A                   |
| Shparber   | Steven    | Nelson Mullins  | N/A                   |
| Sidhom     | Noha      | Prime Trading   | Other Supplier        |
| Sillin     | John      | FERC  | N/A                   |
| Singer     | Chad      | Trane Grid Services                                       | Other Supplier        |

|            |          |  |                      |
|------------|----------|--|----------------------|
| Smith      | Christen | RTO Insider                            | N/A                  |
| Sotkiewicz | Paul     | E-Cubed Policy Associates LLC          | N/A                  |
| Stern      | Alex     | Public Service Electric & Gas Company  | Transmission Owner   |
| Stone      | Andy     | Gabel Associates                       | N/A                  |
| Sturgeon   | John     | Duke Energy Business Services LLC      | Transmission Owner   |
| Sweeney    | Rory     | GT Power Group                         | N/A                  |
| Tangirala  | Subha    | ABB                                    | N/A                  |
| Taylor     | Robert   | Exelon Business Services Company, LLC  | Transmission Owner   |
| Thompson   | Matthew  | XO Energy                              | Other Supplier       |
| Tibbetts   | Maeve    | Pierce Atwood                          | N/A                  |
| Toomey     | Megan    | Talen Energy Marketing, LLC            | Generation Owner     |
| Trayers    | Barry    | Citigroup Energy Inc                   | Other Supplier       |
| Vayda      | Brian    | Borough Of Park Ridge New Jersey       | Electric Distributor |
| Walker     | Jennifer | Exelon Business Services Company, LLC  | Transmission Owner   |
| Wilhite    | Chad     | FirstEnergy                            | Transmission Owner   |
| Wilmoth    | Emily    | Dominion Energy                        | Generation Owner     |
| Wilson     | Bram     | Diamond State Generation Partners, LLC | Generation Owner     |
| Wilson     | James    | Wilson Energy Economics                | N/A                  |
| Zakaria    | Rama     | Environmental Defense Fund             | N/A                  |
| Zevin      | Avi      | Institute For Policy Integrity         | N/A                  |

### PJM Participants

| Last Name | First Name  | Organization        | Sector |
|-----------|-------------|---------------------|--------|
| Advena    | Christopher | PJM Interconnection | N/A    |
| Baker     | Scott       | PJM Interconnection | N/A    |
| Barrett   | Francis     | PJM Interconnection | N/A    |
| Bastian   | Jeff        | PJM Interconnection | N/A    |
| Bell      | Jerry       | PJM Interconnection | N/A    |
| Bennett   | Daniel      | PJM Interconnection | N/A    |
| Bennett   | Stephen     | PJM Interconnection | N/A    |
| Berner    | Aaron       | PJM Interconnection | N/A    |
| Bernstein | Matthew     | PJM Interconnection | N/A    |
| Bielak    | Donald      | PJM Interconnection | N/A    |

|             |           |                     |     |
|-------------|-----------|---------------------|-----|
| Boyle       | Glen      | PJM Interconnection | N/A |
| Bresler     | Stu       | PJM Interconnection | N/A |
| Bruno       | Patrick   | PJM Interconnection | N/A |
| Bruno       | Joshua    | PJM Interconnection | N/A |
| Bryson      | Mike      | PJM Interconnection | N/A |
| Buehler     | Susan     | PJM Interconnection | N/A |
| Burdis      | Tim       | PJM Interconnection | N/A |
| Burlew      | Jim       | PJM Interconnection | N/A |
| Chal        | Hungpo    | PJM Interconnection | N/A |
| Chao        | Hung-Po   | PJM Interconnection | N/A |
| Chmielewski | Brian     | PJM Interconnection | N/A |
| Croop       | Danielle  | PJM Interconnection | N/A |
| Davis       | Elizabeth | PJM Interconnection | N/A |
| DeVita      | Thomas    | PJM Interconnection | N/A |
| Dolan       | James     | PJM Interconnection | N/A |
| Drauschak   | Lisa      | PJM Interconnection | N/A |
| Duane       | Vince     | PJM Interconnection | N/A |
| Fabiano     | Janell    | PJM Interconnection | N/A |
| Falin       | Tom       | PJM Interconnection | N/A |
| Fernandes   | Anisha    | PJM Interconnection | N/A |
| Foster      | Denise    | PJM Interconnection | N/A |
| Foster      | Neel      | PJM Interconnection | N/A |
| Franks      | Chris     | PJM Interconnection | N/A |
| Genuario    | Gabby     | PJM Interconnection | N/A |
| Glatz       | Sue       | PJM Interconnection | N/A |
| Glazer      | Craig     | PJM Interconnection | N/A |
| Gledhill    | Andrew    | PJM Interconnection | N/A |
| Greening    | Michele   | PJM Interconnection | N/A |
| Haque       | Asim      | PJM Interconnection | N/A |
| Hauske      | Thomas    | PJM Interconnection | N/A |
| Helm        | Gary      | PJM Interconnection | N/A |
| Hendrzak    | Chantal   | PJM Interconnection | N/A |
| Herel       | Suzanne   | PJM Interconnection | N/A |
| Herling     | Steve     | PJM Interconnection | N/A |
| Herman      | Michael   | PJM Interconnection | N/A |
| Hilderbrand | Rebecca   | PJM Interconnection | N/A |
| Holland     | Risa      | PJM Interconnection | N/A |
| Holter      | Natasha   | PJM Interconnection | N/A |
| Horger      | Tim       | PJM Interconnection | N/A |

|               |          |                     |     |
|---------------|----------|---------------------|-----|
| Hsia          | Eric     | PJM Interconnection | N/A |
| Jason         | McGovern | PJM Interconnection | N/A |
| Kenney        | Susan    | PJM Interconnection | N/A |
| Keshavamurthy | Bhavana  | PJM Interconnection | N/A |
| Kimmel        | David    | PJM Interconnection | N/A |
| Langbein      | Pete     | PJM Interconnection | N/A |
| Larocque      | Matthew  | PJM Interconnection | N/A |
| Laung         | Thincar  | PJM Interconnection | N/A |
| Lee           | Lori     | PJM Interconnection | N/A |
| Lu            | Chen     | PJM Interconnection | N/A |
| Malladi       | Brinda   | PJM Interconnection | N/A |
| McGill        | Susan    | PJM Interconnection | N/A |
| Mcglynn       | Paul     | PJM Interconnection | N/A |
| Mcgovern      | Jason    | PJM Interconnection | N/A |
| McLaughlin    | Jeffrey  | PJM Interconnection | N/A |
| Messina       | Emmy     | PJM Interconnection | N/A |
| Mooney        | Molly    | PJM Interconnection | N/A |
| Muhl          | Nancy    | PJM Interconnection | N/A |
| Nix           | Emma     | PJM Interconnection | N/A |
| O'Hara        | Chris    | PJM Interconnection | N/A |
| O'Neill       | Jack     | PJM Interconnection | N/A |
| Pacella       | Chris    | PJM Interconnection | N/A |
| Patel         | Anita    | PJM Interconnection | N/A |
| Patel         | Keyur    | PJM Interconnection | N/A |
| Perera        | Asanga   | PJM Interconnection | N/A |
| Phillips      | Darlene  | PJM Interconnection | N/A |
| Pilong        | Chris    | PJM Interconnection | N/A |
| Pilong        | Melissa  | PJM Interconnection | N/A |
| Pincus        | Steven   | PJM Interconnection | N/A |
| Quevada       | Jason    | PJM Interconnection | N/A |
| Reynolds      | John     | PJM Interconnection | N/A |
| Ritchie       | Sandra   | PJM Interconnection | N/A |
| Rocha-Garrido | Patricio | PJM Interconnection | N/A |
| Rogers        | Sarah    | PJM Interconnection | N/A |
| Scheidecker   | Paul     | PJM Interconnection | N/A |
| Schuyler      | Ken      | PJM Interconnection | N/A |
| Schweizer     | David    | PJM Interconnection | N/A |
| Seiler        | Ken      | PJM Interconnection | N/A |
| Shields       | Jeffrey  | PJM Interconnection | N/A |

|             |          |                     |     |
|-------------|----------|---------------------|-----|
| Slusser     | Jeff     | PJM Interconnection | N/A |
| Snow        | Jim      | PJM Interconnection | N/A |
| Souder      | Michelle | PJM Interconnection | N/A |
| Squilla     | Angelica | PJM Interconnection | N/A |
| Stadelmeyer | Rebecca  | PJM Interconnection | N/A |
| Starkov     | Stefan   | PJM Interconnection | N/A |
| Swimm       | Nora     | PJM Interconnection | N/A |
| Tacka       | Natalie  | PJM Interconnection | N/A |
| Tribulski   | Jen      | PJM Interconnection | N/A |
| Velasco     | Cheryl   | PJM Interconnection | N/A |
| Walter      | Laura    | PJM Interconnection | N/A |
| Ward        | Michael  | PJM Interconnection | N/A |
| Warshel     | Kim      | PJM Interconnection | N/A |
| Watkin      | Erik     | PJM Interconnection | N/A |
| Williams    | Stanley  | PJM Interconnection | N/A |
| Xu          | Xu       | PJM Interconnection | N/A |
| Yeaton      | Andrea   | PJM Interconnection | N/A |