

Intermittent Resource Subcommittee
PJM Conference and Training Center
September 18, 2017
1:00 p.m. – 3:00 p.m. EPT

Administration

Mr. Ken Schuyler opened the meeting and reviewed the Agenda.

Mr. Joseph Carl reviewed the Anti-Trust and Code of Conduct and performed the roll call.

The meeting minutes from the March 17, 2017 Intermittent Resource Subcommittee meeting were approved.

Education

Mr. Joe Mulhern reviewed the current status of the Solar Power Forecasts in PJM. As of September 14th, 2017 aggregated Solar Forecasts are available to the public on PJM's Data Viewer and specific forecasts for resource owners are available on Markets Gateway. Behind-the-Meter Forecasts and instantaneous data are displayed in addition to XML capabilities being available.

Mr. Joe Mulhern also reviewed the new Manual 14D meteorological and data requirements for Solar parks with a capability of 3MW or greater. Requirements will be similar to that of wind resources as the data is needed to generate a proper solar forecast. PJM will be reaching out to solar resources to get their data to PJM by a targeted date of second quarter 2018.

Mr. Joe Mulhern also reviewed Lessons Learned from the recent solar eclipse on August 21, 2017. PJM lost approximately 520 MW of grid connected solar generation and 1700 MW of Behind-the-Meter Solar Generation, about what was expected. There was approximately a 5,000 MW load decrease which could be attributable to a drop in temperature during the peak of the eclipse and possibly human behavior due to people limiting normal activity and watching the eclipse. PJM is using the lessons learned to plan for the next eclipse in 2024 where there is expected to be a greater amount of solar resources and a path of totality closer to the PJM footprint.

Mr. Andrew Levitt provided an update on Smart Inverter Standards. Events in Germany point toward the need for Distributed Energy Resources that have ride through, frequency response capability and voltage regulation to be a priority. PJM's current enhanced inverter requirements apply to non-synchronous generators that entered interconnection queues on or after May 1, 2015 that sign an Interconnection Service Agreement. A timeline of inverter rules for PJM, FERC Order 827, and IEEE 1547 was provided. Goal is to refine recommended settings for PJM "enhanced inverter" requirements and for coordinating possible state level ride through requirements. PJM will be studying the impacts of significant deployment of Distributed Energy Resources with and without ride through and voltage regulation. Results of the study are expected next year.

Mr. Scott Baker provided an update on Seasonal Capacity Resources. The Seasonal Capacity Resources Senior Task Force working on these issues has been sunset by the MRC and a new Senior

Task Force has been charged to look at Summer Only Demand Response and Winter Capacity Injection Rights for Wind.

Mr. Scott Baker also provided an update on Distributed Energy Resources in PJM markets. A special session of the MIC has been meeting to discuss options to allow resources connected to the distribution system that may inject megawatts into the system to participate in the PJM energy and ancillary service markets. The next meeting will be held on October 2nd.

Mr. Don Bielak highlighted lessons learned from loss of wind turbine events from South Australia and Texas. Wind generation owners should verify their voltage ride-through capabilities and ensure correct models have provided to Balancing Authorities and Transmission Operators.

Mr. Don Bielak also reviewed NERC industry recommendations following the loss of solar resources during transmission disturbances due to inverter settings. Generation owners should ensure inverter control will not trip due to an erroneous instantaneous frequency measurement during transient disturbances on the power system. The PJM Generation Department has contacted NERC registered solar resources requesting a copy of their data sheets being sent to NERC. PJM also plans to expand the poll to other inverter based resources for planning purposes for the potential loss of these resources during transmission faults.

Mr. Tom Falin provided information regarding the charge by the MRC to evaluate Winter Resource Adequacy primarily centered around winter peak load forecasting, winter season resource adequacy and winter season reliability requirements. Next steps include reviewing the summer and winter reliability requirements, evaluating operational risk during the winter such as increasing penetration of gas generation, and further investigation of the winter load forecast model.

Mr. Vince Stefanowicz provided a summary from the Primary Frequency Response Senior Task Force which is evaluating the need for Primary Frequency Response by generators in PJM. Key work activities beyond the education phase are evaluating the existing state of PFR in PJM, eligibility, measurement and verification requirements and potential compensation issues and mechanisms.

Ms. Janell Fabiano presented information on the PJM Member Survey which is open until September 22, 2017. Participation is encouraged by members as PJM values the feedback. This year's survey should be faster and easier to complete than previously.

Future Agenda Items

None at this time

Future Meeting Dates

December 11, 2017	1:00 p.m.	WebEx
March 5, 2018	1:00 p.m.	WebEx
June 4, 2018	1:00 p.m.	WebEx
September 17, 2018	1:00 p.m.	WebEx
December 10, 2018	1:00 p.m.	WebEx

Author: *Joseph M. Carl*

Antitrust:

You may not discuss any topics that violate, or that might appear to violate, the antitrust laws including but not limited to agreements between or among competitors regarding prices, bid and offer practices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that might unreasonably restrain competition. If any of these items are discussed the chair will re-direct the conversation. If the conversation still persists, parties will be asked to leave the meeting or the meeting will be adjourned.

Code of Conduct:

As a mandatory condition of attendance at today's meeting, attendees agree to adhere to the PJM Code of Conduct as detailed in PJM Manual M-34 section 4.5, including, but not limited to, participants' responsibilities and rules regarding the dissemination of meeting discussion and materials.



Draft Meeting Minutes

In-Person Attendees:

Schuyler	Ken	PJM Interconnection, LLC	Not Applicable
Carl	Joseph	PJM Interconnection, LLC	Not Applicable
Baker	Scott	PJM Interconnection, LLC	Not Applicable
Bielak	Don	PJM Interconnection, LLC	Not Applicable
Ciabattoni	Joe	PJM Interconnection, LLC	Not Applicable
Fabiano	Janell	PJM Interconnection, LLC	Not Applicable
Falin	Tom	PJM Interconnection, LLC	Not Applicable
Levitt	Andrew	PJM Interconnection, LLC	Not Applicable
Mulhern	Joe	PJM Interconnection, LLC	Not Applicable
Stefanowicz	Vince	PJM Interconnection, LLC	Not Applicable

In Attendance via WebEx / Teleconference:

Achaab	Edward	AEP Energy Partners Inc.	Other Supplier
Ainspan	Malcolm	Energy Curtailment	Other Supplier
Anders	Dave	PJM Interconnection, LLC	Not Applicable
Benckek	Jim	FirstEnergy Solutions Corp.	Transmission Owner
Bennett	Stephen	PJM Interconnection, LLC	Not Applicable
Bolan	Martin	FirstEnergy Solutions Corp.	Transmission Owner
Boyle	Glen	PJM Interconnection, LLC	Not Applicable
Brodbeck	John	EDP Renewables	Other Supplier
Brown	Rich	PJM Interconnection, LLC	Not Applicable
Chen	Jennifer	Natural Resources Defense Council	Not Applicable
Chocarro Aquirrahengoa Iker		E.On Climate and Renewables	Generation Owner
Currier ES	Jeff	Dominion Virginia Power	Not Applicable
Davis	James	Dominion Energy Marketing Inc.	Generation Owner
Delosa	Joseph	DE Public Service Commission	Not Applicable
Dessenger	Harry	Customized Energy Solutions, Ltd	Not Applicable
Dugan	Chuck	East Kentucky Power	Transmission Owner
Farber	John	DE Public Service Commission	Not Applicable
Feierabend ES	Rick	Dominion Virginia Power	Not Applicable
Filomena	Guy	Customized Energy Solutions, Ltd	Not Applicable
Fitch	Neal	NRG Power Marketing, LLC	Generation Owner
Foladare	Kenneth	Tangibl	Not Applicable
Ford	Adrien	Old Dominion Electric Cooperative	Electric Distributor
Gilani	Rehan	ConEdison Energy Inc.	Other Supplier
Greening	Michele	PPL Electric Utilities Corp.	Transmission Owner
Hendrzak	Chantal	PJM Interconnection, LLC	Not Applicable
Hoatson	Tom	Riverside Generating, LLC	Other Supplier
Horstmann	John	Dayton Power & Light	Transmission Owner
Hyzinski	Tom	GT Power Group	Not Applicable
Johnson	Carl	Customized Energy Solutions, Ltd	Not Applicable
Kaczanowski	Marek	Baltimore Gas and Electric	Transmission Owner
Kauffman	Brian	NRG Curtailment	Other Supplier
Kelly	Stephen	Brookfield Energy Marketing, LP	Other Supplier
Kilgallen	Kevin	Avangrid Renewables, LLC	Generation Owner
Kingston	Amber	North Carolina Electric	Electric Distributor
Kogut	George	New York Power Authority	Other Supplier
Krauthamer	Michael	Maryland Public Service Commission	Not Applicable
Labij	Christina	EcoGrove Wind, LLC	Generation Owner
Lee	Lori Murphy	PJM Interconnection, LLC	Not Applicable
Ma	Alex	Invenergy, LLC	Generation Owner
Manion	Evelyn	PJM Interconnection, LLC	Not Applicable



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Mariam	Yohannes	Office of the Peoples Counsel for the District of Columbia	End Use Customer
Marton	David	FirstEnergy Solutions Corp	Transmission Owner
Marzewski	Skyler	Monitoring Analytics, LLC	Not Applicable
McAlister	Lisa	American Municipal Power	Electric Distributor
Midgley	Sharon	Exelon Business Services	Transmission Owner
Norton	Chris	American Municipal Power	Electric Distributor
O'Connell	Robert	PPGI Fund A/B Development	Generation Owner
Ondayko	Brock	Appalachian Power	Transmission Owner
Patten	Kevin	Appalachian Power	Transmission Owner
Peoples	John	Duquesne Light Company	Transmission Owner
Pratzon	David	GT Power Group	Not Applicable
Price	Ruth	Division of the Public Advocate of the State of Delaware	End Use Customer
Rohrbach	John	Southern Maryland Electric Cooperative	Electric Distributor
Rothey	Kristin	American Municipal Power	Electric Distributor
Sasser	Jonathan	Customized Energy Solutions, Ltd	Not Applicable
Scarpignato	David	Calpine Energy Services, LP	Generation Owner
Shields	Tom	Iberdrola Renewables	Generation Owner
Swigonski	Frank	Advanced Energy Economy	Not Applicable
Tacka	Natalie	PJM Interconnection, LLC	Not Applicable
Thomson	Heather	Mid-Atlantic Renewable Energy	Not Applicable
Walter	Laura	PJM Interconnection, LLC	Not Applicable
Whitehead	Jeffrey	GT Power Group	Not Applicable
Wilkie	Brian	Consolidated Edison	Other Supplier