



# **Coordinating without the ConEd/ PSEG Wheel**

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*KCC*

# Agenda

- **Background**
- **Summary of September 16<sup>th</sup> Joint Meeting**
- **Treatment of RECo Load**
- **Out of Service PARs**
- **Coordination with PJM**
- **Impacted NYISO Tariff Sections**
- **Timeline/Next Steps**
- **Appendix I - Definitions**
- **Appendix II – Proposed Interchange Percentages**

# Background

# Background

## PJM/NYISO Wheel Replacement Protocol Project Overview

### Why was the project started?

ConEd notified involved parties of intention to terminate non-conforming wheeling service on April 28, 2016. PJM and NYISO are working jointly to develop a replacement protocol to address the operational, planning, and market impacts.

### What is the wheeling service that is currently in place?

The non-conforming wheeling service has historically been implemented by NYISO and PJM by modeling a fixed 1000 MW flowing from NYISO to PJM over the JK (Ramapo-Waldwick) interface and from PJM to NYISO over the ABC (Hudson-Farragut and Linden-Goethals) interface

### When does the replacement protocol have to be in place?

- Current non-conforming wheeling service will end on April 30, 2017.
- New protocol must be in place for use on May 1, 2017

### What is the impact to Market Participants?

- Primary impact to PSE&G and ConEd as facility owners
- Beyond the revised protocol/ market impacts, no changes to OASIS/ Energy Transaction bidding processes

# Background

- **Current protocol**
  - ***Real-time Operations***
    - 61% of NY-PJM AC interchange, and 80% of RECo load is applied to the 5018 desired (i.e., target) flow calculation in Real-time Operations
  - ***Markets:***
    - NYISO Markets model 61% of the NY-PJM AC Interchange injected at 5018, and 39% at the Western Ties for scheduling and pricing
    - PJM Markets model 80% of the NY-PJM AC Interchange injected at the Roseton bus, and 20% injected at the Dunkirk bus for scheduling and pricing
  - ***Planning:***
    - Both NYISO and PJM Planning consider NY-PJM interchange and RECo load deliveries consistent with their market models

# **Critical Factors for a Near-Term Solution**

- **Supports reliable operation of the transmission system**
- **Effectively manages congestion across the region**
- **Provides for open access and utilization of the facilities to serve the public interest and provide benefit to consumers**
- **Does not hinder use of the facilities to respond to emergencies in real-time**
- **Preserves competitive market behaviors**
- **Can be facilitated with the Phase Angle Regulator (PAR) technology at the ABC, JK, and 5018 interfaces (current equipment for May 1, 2017 implementation)**
- **Can be implemented in both PJM and NYISO market models**

# **Summary of September 16<sup>th</sup> Joint Meeting**

# Solution Overview

- **Include ABC and JK as part of the NY-PJM AC Interface for interchange scheduling\***
  - *ABC and JK interfaces will be completely incorporated into overall NY-PJM AC Interface for interchange scheduling and pricing purposes*
  - *A percentage of the overall NY-PJM AC Interchange, as well as a flow offset (referred to as the Operational Base Flow) will be modeled in the NYISO and PJM Markets, and will be included in the real-time desired flow calculations of those facilities*
    - Details on these concepts are discussed later in this presentation
- **Add the PARs on ABC and JK to the Market-to-Market PAR Coordination process between NYISO and PJM**
- **PJM to redefine the NYIS Proxy bus Interface definition**



# Solution Overview

- **This proposal of combining ABC, JK, 5018 and the Western ties into one aggregate PJM-NY AC Proxy Bus presents several advantages**
  - ***It leverages existing market constructs in both the NYISO and PJM markets***
    - This increases the likelihood of implementation by May 1<sup>st</sup> , 2017
  - ***It can be supported by the PAR technology currently installed on these interfaces***
    - These PARs are capable of facilitating an aggregate PJM-NY AC Proxy Bus interchange schedule across the ABC, JK, 5018, and the Western ties because when schedules are under- or over- delivered across an interface, the difference is made up across the other interfaces

# OBF and Interchange Percentages

- **The OBF will be applied to the JK and ABC interfaces as a starting point for determination of each Interface's Target Flow**
  - *The Interchange Percentage\* values will be applied on top of the OBF at all times to determine each Interface's Target Flow value*

**\*See Appendix II for the proposed Interchange Percentage values**

# Planning Assumption Impacts

- **Following implementation of the new protocol described in this presentation, NYISO and PJM planning studies will assume the interchange percentages and consider modeling the OBF for future studies until appropriate long-term planning assumptions have been determined**

# Long Term

- **The NYISO and PJM proposal is based on current grid equipment**
  - *If the technology in use changes, then the NYISO and PJM would have to revisit this design*
- **In the future, if the PARs at the ABC, JK, and 5018 interfaces are upgraded in a manner that allowed them to effectively implement interface-specific interchange schedules, then such modeling is possible within the NYISO's market structure**
  - *This proposal does not preclude the ABC or JK interfaces from being modeled as distinct Proxy Buses if the PAR technology is upgraded*

# Treatment of RECo Load

# Treatment of RECo Load

- Consistent with current practice, the NYISO and PJM will continue to include 80% of Rockland Electric Company (RECo) load in the Target Flow calculation for 5018\*
  - **For example, consider the interchange is 1000 MW to NY and RECo load is 450 MW**
    - In this case, the target flow for the 5018 interface would be 680 MW ( $Target_{PAR3500} + Target_{PAR4500}$ )  
 $Target_{PARx} = (PARx \text{ Interchange Factor} + RECo \text{ Load} + \text{Operational Base Flow})$   
 $Target_{PAR3500} = (((32\%/2) * 1000 \text{ MW}) + (80\% * 450 \text{ MW}/2) + 0 \text{ MW})$   
 $Target_{PAR3500} = 340 \text{ MW}$   
 $Target_{PAR4500} = (((32\%/2) * 1000 \text{ MW}) + (80\% * 450 \text{ MW}/2) + 0 \text{ MW})$   
 $Target_{PAR4500} = 340 \text{ MW}$
  - **For an additional example, consider the interchange is -1000 MW to PJM and RECo load is 450 MW**
    - In this case, the target flow for the 5018 interface would be 40 MW ( $Target_{PAR3500} + Target_{PAR4500}$ )  
 $Target_{PARx} = (PARx \text{ Interchange Factor} + RECo \text{ Load} + \text{Operational Base Flow})$   
 $Target_{PAR3500} = (((32\%/2) * -1000 \text{ MW}) + (80\% * 450 \text{ MW}/2) + 0 \text{ MW})$   
 $Target_{PAR3500} = 20 \text{ MW}$   
 $Target_{PAR4500} = (((32\%/2) * -1000 \text{ MW}) + (80\% * 450 \text{ MW}/2) + 0 \text{ MW})$   
 $Target_{PAR4500} = 20 \text{ MW}$

\*Note that 80% of RECO load will still be included within the Target Flow if only one Ramapo PAR is in service

# **Out of Service PARs**

# Treatment of Out of Service PARs

- At times, PAR outages can prevent flow over certain facilities
  - *If a PAR is out, the NYISO will add that PAR's percent of interchange to the Western Ties*
    - For example, if 5018 has only one PAR in service, 16% will be added to the 32% interchange percentage normally assumed to flow over the Western Ties. This scenario is shown in the table below

	Western Ties	5018 (Plus 80% of RECo)		JK (Minus OBF)			ABC (Plus OBF)		
		3500	4500	E	F	O	A	B	C
All PARs in Service	32%	16%	16%	5%	5%	5%	7%	7%	7%
3500 PAR Out of Service	48%	0%	16%	5%	5%	5%	7%	7%	7%



# Coordination with PJM

# Whitepaper

- **The NYISO and PJM will post the final version of the whitepaper with today's meeting materials**
  - ***Stakeholder feedback is welcome***

# Joint Operating Agreement (JOA)

- **The NYISO and PJM will work over the next couple of months on revisions to the current JOA\***
  - *The NYISO is targeting stakeholder review of these revisions at two MIWG meetings in November, followed by stakeholder approval in December*

\*See NYISO OATT sections 35.2, 35.12, and 35.23

# Approval Process

- **PJM has continued to discuss this joint proposal within their stakeholder process, and will continue to do so as revisions to the JOA progress**
  - *However, PJM is not obligated to seek stakeholder approval on the proposal*
- **The NYISO and PJM will file the tariff updates associated with Coordinating without the ConEd/PSEG Wheel as part of a joint FERC filing**

# **Impacted NYISO Tariff Sections**

# Impacted NYISO Tariff Sections

- Tariff revisions will be required in several sections, including but not necessarily limited to the following
- **MST 17.1**
  - *Revise sections discussing interchange schedules*

# Impacted NYISO Tariff Sections

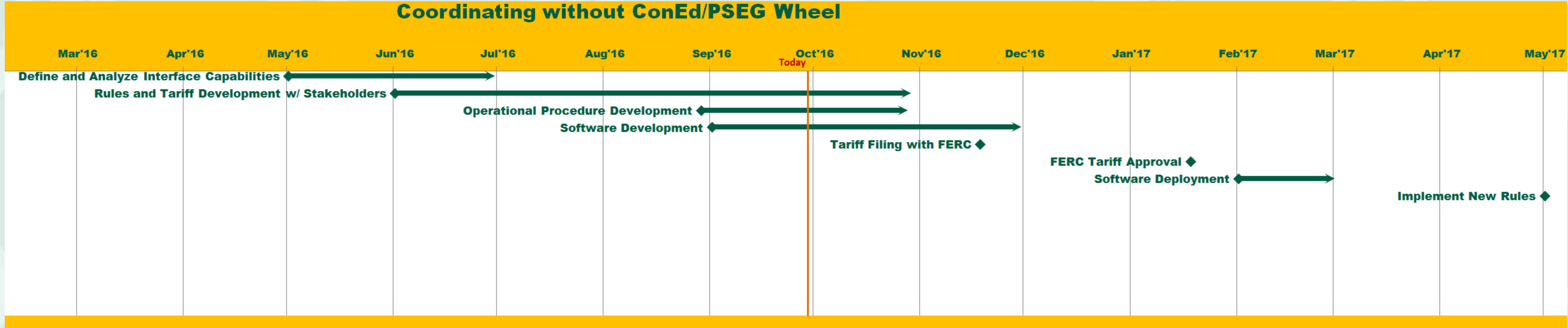
- **Revise the Joint Operating Agreement:**
  - ***NYISO OATT Sections 35.2, 35.12, 35.23***
    - **Include definition and description of the OBF**
    - **Refer more generally to “PARs,” as opposed to Ramapo, especially in settlement formulas**
    - **Discuss PAR tap limitations**
    - **Address emergencies**

# **Timeline/ Next Steps**



# Timeline

## Coordinating without ConEd/PSEG Wheel



Date	Task
5/1/2016	Define and Analyze Interface Capabilities
6/1/2016	Rules and Tariff Development w/ Stakeholders
8/29/2016	Operational Procedure Development
9/1/2016	Software Development
1/31/2017	Tariff Filing with FERC
February 2017	Software Deployment
3/31/2017	FERC Tariff Approval
5/1/2017	Implement New Rules

# Next Steps

- ✓ **September 16<sup>th</sup> Joint NYISO/PJM Meeting**
  - ✓ *Continue proposal discussion*
- ✓ **September 29<sup>th</sup> MIWG**
  - ✓ *Continue proposal discussion*
- **PJM's October Committee Meetings**
  - *October 4<sup>th</sup> OC – proposal update*
  - *October 5<sup>th</sup> MIC – proposal update*
  - *October 6<sup>th</sup> PC – proposal update*
- **October/ November MIWG**
  - *Discuss draft tariff language*
- **PJM's November/ December Committee Meetings**
  - *Review PJM/NYISO JOA language updates*
- **December BIC/MC**
  - *Vote on draft tariff language*
- **January 2017**
  - *Seek Board Approval*
  - *File with FERC (Joint Filing)*
- **May 1, 2017 Implementation**

# **Appendix I - Definitions**

# Definitions

- **Non-conforming Wheel:**
  - *The non-conforming Wheel is a transmission service contract that physically transfers MWs between NYISO and PJM through a fixed MW level flowing from NYISO to PJM over the JK (Ramapo – Waldwick) interface, and from PJM to NYISO over the ABC (Linden – Goethals and Hudson – Farragut) interface.*
- **JK interface:**
  - *Ramapo (NYISO) – Waldwick (PJM) 345 kV interface that is controlled by three parallel PARs at Waldwick 230 kV that are in-series with the JK interface.*
- **ABC interface:**
  - *The Linden (PJM) – Goethals (NYISOS) 230 kV (“A” interface) and two Hudson (PJM) – Farragut (NYISO) 345 kV (“B and C”) PAR controlled transmission facilities make up the ABC interface.*
- **5018 line:**
  - *This is the Hopatcong (PJM) – Ramapo (NYISO) 500 kV PAR controlled facility.*
- **Western ties:**
  - *The non-PAR controlled free flowing AC ties between NYISO and PJM that are geographically located on the New York to Pennsylvania border. This interface consists of 345 kV, 230 kV and 115 kV transmission facilities.*
- **Operational Base Flow (OBF):**
  - *Baseline value used as part of the JK/ABC target flow calculations. The OBF accounts for the “natural flow” of MW across the JK/ABC interfaces.*

# **Appendix II – Proposed Interchange Percentages**

# Interchange Percentages

- Proposing a combination of two concepts:
  - Account for an Operational Base Flow (OBF) as a starting point*
  - Apply an interchange percentage distributed to each PAR:*

Line	Line Percent Distribution	PAR	PAR Percent Distribution
5018	32%	3500	16%
		4500	16%
A	21%	A	7%
B		B	7%
C		C	7%
JK	15%	E	5%
		F	5%
		O	5%
Western Ties	32%	N/A	N/A

- The percentages above would change absent an OBF based on current system topology

**The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:**

- *Maintaining and enhancing regional reliability*
- *Operating open, fair and competitive wholesale electricity markets*
- *Planning the power system for the future*
- *Providing factual information to policy makers, stakeholders and investors in the power system*

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