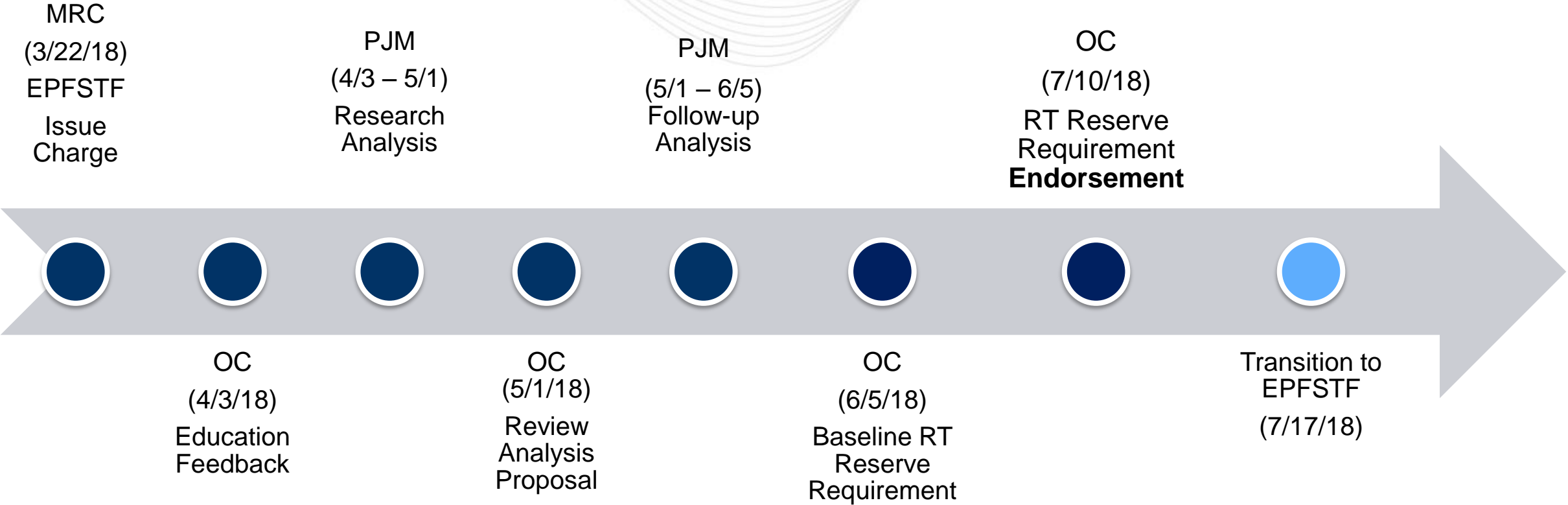


Real Time 30 Minute Reserves

Vince Stefanowicz
Sr. Lead Engineer, Generation
Energy Price Formation Sr. Task Force
July 17, 2018

- Energy Price Formation Sr. Task Force (EPFSTF)
 - Issue Charge approved at 3/22/18 Markets and Reliability Committee (MRC)
 - Stakeholder Group Assignment
 - “This work will be assigned to a new senior task force reporting to the Markets and Reliability Committee (MRC), provided that the reliability-related aspects of real-time secondary reserves product will be assigned to the Operating Committee (OC).”
 - Key Work Activities
 - Item 1. Provide education on topics including, but not limited to:
 - g. The interdependencies between primary reserves and secondary reserves, and the reliability basis for real-time reserves.
 - Item 9. Develop a real-time secondary reserve product that addresses the real-time primary and secondary reserve requirements, taking into account the impact of operational variability.

<http://www.pjm.com/-/media/committees-groups/task-forces/epfstf/postings/energy-price-formation-issue-charge.ashx?la=en>



**Day-Ahead Scheduling Reserve
(Time \leq 30 min.)**

Real-Time 30-Minute Reserve

**Contingency (Primary) Reserve
(Time \leq 10 min.)**

**Secondary Reserves
(10 min. \leq Time \leq 30 min.)**

**Synch Reserves
(Synchronized)**

**Non-Synch Reserves
(Offline)**

- Real Time **30 Minute Reserve Objective** of 3784 MW
 - 200% of largest unit which is approximately 1500 MW
 - 3 year average of seasonal, 1 hour-ahead value of:
 - Load Forecast Error (MW), Wind Forecast Error (MW), Solar Forecast Error (MW)
 - Reviewed and updated annually
- **Methodology for adjusting** requirement based on:
 - Management Gas Pipeline Contingencies
 - 30 Minute Reserve Requirement would become the **greater of** 3784 MW or MW value of units affected by gas contingency
 - Conservative Operations
 - In accordance with Manual 13, Emergency Operations, Section 3.2
 - Adjustments generally consistent with those made in Day-Ahead

- Operational need now defined - Operating Committee action now completed
- Real-Time 30-Minute Reserve to be added to future EPFSTF agenda, and will include:
 - Additional education on reserves
 - Discussion on pricing and optimization with other ancillary services
 - Eligible resources
 - Dispatch in real time