# Operations Approach to a Peak Day

OC Special Session

July 2014

- Evaluate Load Projections (up to 7-days out) vs Current Day
- Compare currently on-line capacity to required capacity
- Review Transmission and Generation outages
  - Reliability analysis (EMS Power Flow studies)
  - Cancel or reschedule those that affect reliability
- Evaluate start up and notification times
  - Day Ahead Market can only commitment units with ≤36 hour Time to Start

# Data requirements

- Data needed:
  - Change in load from day to day
    - PJM Load forecast
  - Total available capacity for currently on-line units
    - Submitted by members and aggregated by PJM
  - Time to Start for all off-line units
    - Submitted by members
  - Cost
    - Submitted by members but only reflective of current and eventually after the DA Market closes, next day offers.

- Disclaimer!
  - The following slides will walk through a simplified example for the purposes of this committee. We will assume for simplicity that the interchange remains constant from peak to peak and that reserve requirements do not change with the load. Neither of these are true but including them would only serve to complicate this example while giving no additional benefit to the discussion.

# Simplified example

- Change in load:
  - Today = 110,000MWs.
  - Tomorrow is 111,000MWs
  - Three days we jump to 140,000MWs (@0600hrs)
- Total available on-line capacity is 120,000MWs
  - 140,000-120,000 = 20,000MWs of capacity needed to meet the load three days out

# Simplified example

- Capacity availability by Times to Start (TTS):
  - <12hrs TTS: 18,000MWs
  - 12-24hr TTS: 5,000MWs
  - 24-48hr TTS: 2,000MWs
- 20,000MWs required to meet the 6am peak load.
  - 18,000MWs are available to be called an on-line with 12 hrs. notice. Can we wait for the DA Market to post?
  - No. The DA Market posts at 1600hrs the day prior. If notifications are not made prior to 1600hrs for the remaining 2,000MWs required, there would be a capacity deficiency.

# Simplified example

- Summary:
  - The first key piece of data utilized by PJM for scheduling generation is the Time to Start. This lets us know if we can wait for the Market to post or if we need to make notifications prior to the market close
  - The second key piece of data is the price of the unit. If generation must be called prior to the market and multiple units are available, then price is the deciding factor in who is called.

# Instructions and Directives

- Section 4.2.4 of PJM Manual 01 distinguishes dispatch or operating instructions from directives. See PJM Manual 01: Control Center and Data Exchange Requirements, Version 26 (effective April 11, 2014). The distinction is that directives are imminently vital to the reliability and operations of the bulk electric system and are related to real-time operations.
- The NERC glossary and PJM Manual 01 define directives this way and PJM dispatch operators and PJM Member operators have trained with this distinction in mind extensively.
- Dispatch or operating instructions are also important to operations but do not have the real-time or reliability criticality as directives. Instructions include communications such as day (or multiple days') scheduling conversations, responding to operations questions, etc. These communications have the benefit of time to allow for additional discussion, clarification, and escalation which are not possible with directives.
- Often the communications between PJM operators and Member operators are initiated by questions related to equipment status, readiness, updates, etc. This type of communication can be initiated by either PJM or the Member. This informational communication in itself does not rise to the level of operational instruction or directive, but is useful to provide the Member or PJM with any relevant information they might need. It is part of PJM's responsibility if needed to turn the informational communication into the appropriate dispatch or operational instruction or directive. PJM and its stakeholders are currently examining whether the protocols around system and generation operator communications warrant improvements in order to reduce uncertainty and risk to generators. See PJM Operating Committee - Gas Unit Commitment Coordination Problem Statement, (available at http://www.pjm.com/~/media/committees-groups/committees/oc/20140623/20140623-item-06-gas-firedunit-commitment-coordination-mrc-issue-charge.ashx).

- Questions