Wind and Solar Real-time Dispatch:
Opportunities for Enhancements

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Problem Statement

- Wind and solar resources are increasing on PJM system
- Physical characteristics of fast ramp and uncertain forecast introduce challenges for PJM Dispatch to manage power balance and transmission constraint control in real-time
- Explore opportunities to improve the reliability and pricing on the system

Concern: Incorrect or Stale Inputs

- Resources that operate inconsistent with economic maximum can cause reliability issues by creating discrepancies between RT SCED results and actual system conditions:
  - RT SCED utilizes a consistent description of conditions on the electric network in the PJM Region by using the most recent solution produced by the State Estimator program and the previous economic base point to calculate the Achievable Target MW (ATM) and economic basepoint for next ten minute target time
  - Economic basepoint is limited by current bid-in economic limits
- This can result in missing MWs for system control, which if large enough in volume, can cause swings in ACE and/or the need to manually dispatch specific resources

Concern: Very High Ramp Rates

- Ramp rates are a key element of a valid generator offer that describe the MW/Minute increase or decrease of a unit being offered for economic dispatch.
  - The ramp rate shall be based on the actual capability of the unit given the confines of the PJM software and shall not be used to withhold a portion of the capacity or ramping capability of a unit from the market
  - Hourly ramp rates must be updated regularly to account for latest ambient conditions
  - Default is 9,999 MW/minute when no ramp rate is submitted
- Dispatchable wind and solar resources can “out perform” 5-minute dispatch solutions, contributing to constraint control volatility (binding/un-binding)

Concern: Limited Use of Forecast Data in Clearing Engines

- The only resource-based forecast utilized by the real-time study modes (ASO, IT SCED, RT SCED, LPC) is the solar forecast during sunrise/sunset periods of IT SCED
  - Can improve CT recommendations for TTS <= 2 hours

- Opportunities to analyze the benefits to include PJM, other forecasts in the real-time study modes in lieu of utilizing bid-in eco max and ramp rate values

Key Work Activities

- Education
  - Review existing real-time study mode treatment of all resource types
  - Review examples of existing issues facing PJM Dispatch
- Examine other RTO/ISO methodologies for wind and solar dispatch
- Develop solution packages and governing document language as necessary in roughly six to twelve months

Issue Scope

- Real-time clearing engine methodologies including treatment of input data
- Communication of dispatch mode and instructions
- Expectations of wind and solar resources for market data submissions and performance
- Market settlements calculations including but not limited to uplift eligibility

Not in scope:

  - New market products
  - Capacity accreditation business rules
  - Reserve capability and methodology calculations
  - Forecast accuracy improvements

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Wind and Solar Real-time Dispatch

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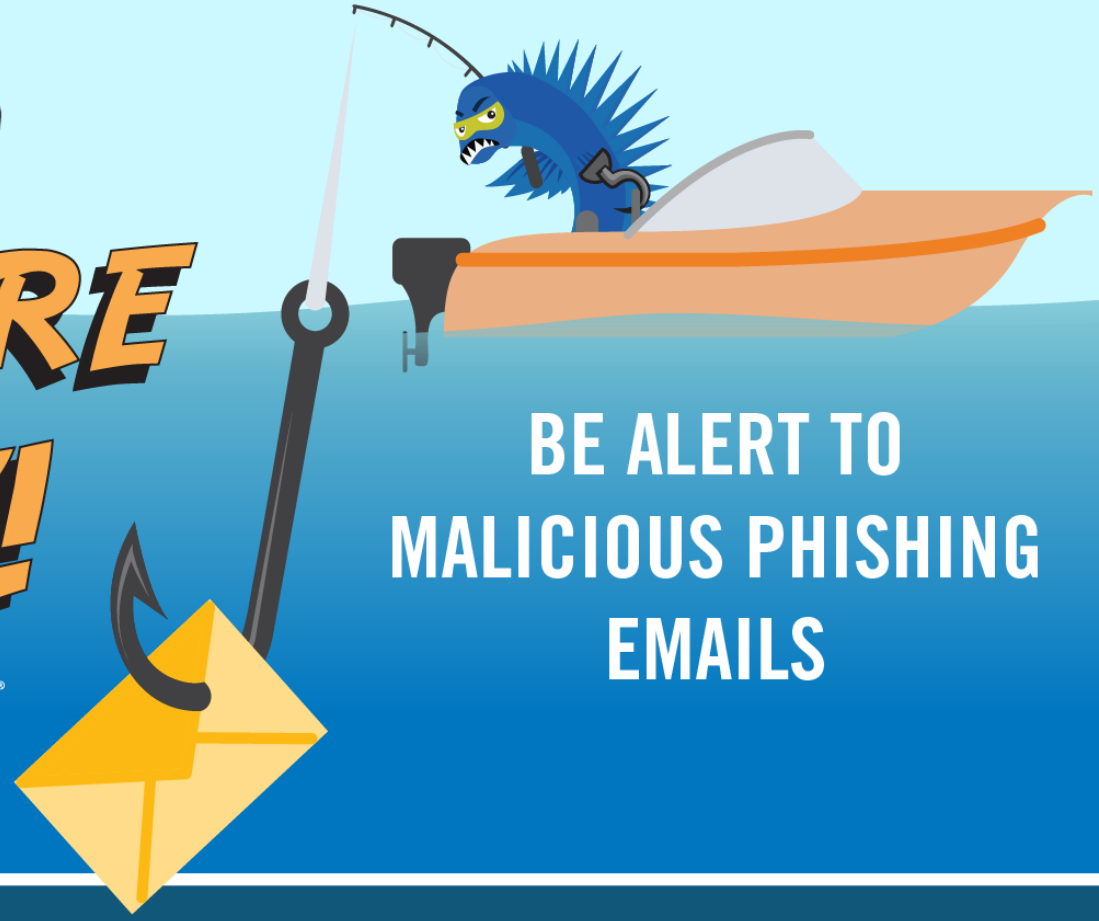
pjm



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