PJM Planning Load Data Needs

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June 26, 2023

Load Data Needs

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Importance of Load Data

- Accurate load forecasting & modeling is an essential part of developing accurate RTEP planning models.
- Identification of needed transmission upgrades relies on having a reasonable future load profile within the planning time horizon.
  - System reinforcements could follow the identification of need
  - The size and nature of solutions will depend on;
    - The nature of need (large/small) and
    - Whether it has long term growth component or just one-off increase in load
- Inadequate representation of load growth/forecast in system planning models lead to:
  - Missing the need to reinforce totally (no or late identification of need)
  - Suboptimal reinforcements (too small or too large)
  - Inadequate transmission system capability (breathing room) to allow for construction (late system upgrades)

Underestimating vs. Overestimating Load

- **Reasonable load forecasts in transmission planning leads to:**
  - Enablement of remnant capacity to support reliably serving load growth
  - Avoid curtailments (if the system runs out of capability)
  - Difficulties scheduling outages to build needed transmission
    - System capability is quite limited with short windows for outages
    - Transmission build delays and inability to put reinforcements in place in the time needed
  - Creating operational constraints on the system
    - Day-to-day operational challenges even without outages
- **Overestimating load projections can lead to:**
  - Too much-too-soon transmission upgrades
- **Load forecast used for transmission planning needs to be prudent and take multiple factors into consideration**
  - Uncertainties around the forecast could be managed via staging developments and consideration of other secondary benefits (least regrets solutions)

Data Center Development in the PJM Footprint

- PJM has observed unprecedented data center load growth in certain areas of the footprint
  - Proven growth on the ground (local land use, permitting and system load)
  - Now expanding to multiple Transmission Owner areas
  - Rapid load growth warranted the need for an Immediate Need project in 2022 to address reliability violations observed in the 2025 timeframe.
    - System reinforcements particularly at the EHV levels require time to build
    - It is unreliable to wait until all remnant capacity on the transmission system is utilized
      - Quickly shifts local reliability issues to regional reliability issues.

2022 RTEP Data Center Planning Window 3

- PJM opened a competitive window this year (2/24 – 5/31) to resolve reliability criteria violations due to data center growth
  - Scope and breath of violations span multiple Transmission Owner zones
    - Local and regional constraints impacting system
    - Temporary VAR reinforcements added to the planning model to address case solution issues (voltage collapse)
  - Load forecasting and modeling play a pivotal role in planning the future needs of the system

Enhanced Long Term Regional Transmission Planning

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Why PJM is Advancing Enhanced LTRTP

- Large-scale changes in the resource mix and load growth are expected to continue over the coming decades. Ensuring a reliable energy transition is important. By enhancing the existing long term transmission planning processes, PJM can maintain reliability by identifying and implementing cost-effective transmission solutions.

- PJM agrees with FERC's rationale, as outlined in the NOPR, on the benefits of an enhanced LTRTP process to maintain and enhance reliability, given these anticipated large-scale changes.

LTRTP and Load Forecasting

- As discussed in the NOPR comments, PJM will be pursuing a scenario based planning approach.
  - https://pjm.com/-/media/documents/ferc/filings/2022/20220817-rm21-17-000-pjm.ashx
- PJM will be developing multiple long term (6 -15 years out) planning scenarios.
- LTRTP processes will identify necessary long-lead EHV reinforcements with sufficient time to construct ensuring reliability is maintained.
  - Accurate load forecasting is a key component to building plausible scenarios to be analyzed.

LTRTP Next Steps

- Upcoming LTRTP Workshop:
  - July 19th 2023: Register on Planning Committee page

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