Technical Advisory Panel (TAP) Meeting #3

Tuesday, October 22, 2019
9:00am – 11:00am
WebEx

Attendees

Anderson Hoke, NREL
Jeff Burke, APS
Derek Stenclik, Telos Energy
Julia Matevosjana, ERCOT
Matt Richwine, Telos Energy
Paul De Martini, Newport Consulting
Robert Sheridan, National Grid
John Cole, HNEI
Terry Surles, HNEI
Christopher Lau, HE
Peter Young, HE
Dean Arakawa, HE
Robert Uyeunten, HE
Dean Oshiro, HE
Daniel Lum, HE
Christopher Kinoshita, HE
Brian Lam, HE
Sorapong Khongnawang, HE
Isaac Lum, HE
Kenton Suzuki, HE
Amanda Yano, HE
Alan Hirayama, HE
Marisa Chun, HE
Jeremy Laundergan, EnerNex

Objective

- Discuss stakeholder comments received on the three planning criteria and draft Soft Launch NWA RFP
- Introduce the revised IGP sourcing process and unit retirement considerations for IGP

Agenda

- Review stakeholder comments on three planning criteria:
  - Addition of Resources
  - Regulating and Ramp Reserves
  - Transmission Planning
- Review stakeholder comments on Soft Launch RFP
- Discuss on unit retirement considerations for IGP
- Review revised draft of IGP sourcing process
- Next Steps and topics for future TAP meetings

Discussion

I. Energy Reserve Margin Comments

Alternative approaches such as LOLE (Loss of Load Expectation):

-LOLE may be more appropriate for long term planning when looking at many years and many different resource plans.

-In the PSIP, load shapes were changing year over year because of differences in energy efficiency, demand response and DGPV. Daytime loads were being increased with DR. Load shapes without DGPV were highest during the day rather than typical peak in the evening.

-ELCC (Effective Load Carrying Capability) values need to be re-estimated with changes in assumptions. LOLE would take much more time to evaluate under these changing assumptions.

-Storage is different because it shifts load but does not generate energy. For storage, it is important to not only capture MW of peak load but also the amount of energy to serve the peak period. Need to make sure there is enough energy to charge the storage for a reliable energy discharge when needed.

II. Regulating Reserve and Ramp Requirements

Data availability for PV:

-The estimates will be based on the best data available. Data from advanced metering will be used when available.

Accounting for DGPV paired with storage in ramping and regulating reserve calculations:

-Coefficients for reg and ramp will be updated as new projects come online and recorded data becomes available. For DGPV paired with storage, they will be treated in the same way as the Stage 1 grid-scale renewable and storage projects that are currently assumed to be self-regulating and self-ramping.

III. Transmission Planning Criteria

On reliability and safety as inverter-based resources replace synchronous generation:

-A Reliability Standard working group helped to develop reliability standards for the utility resulting in HI-TPL-001 through 004. HI-TPL-001 follows NERC

requirements, but was never approved by the Commission. For IGP, we will be incorporating the Planning Events Table from HI-TPL-001.

-In the earlier stages of renewable integration, the HECO transmission systems' frequency remained stable with increasing NEM and FIT. In the current timeframe, with the resource plans we have, it is essential to consider the physical limitations of our existing transmission system.

-On the neighbor islands, where the transmission system is weaker, it is becoming increasingly difficult to bring renewables onto the system. Therefore, HECO is looking into other ways to perform analyses on the transmission system by replacing generating units with synchronous condensers and other forms of inertia.

-Adding transmission capacity to support optimized resource plans in the RFP process is not feasible (i.e., we need to build transmission capacity to the resource zones like ERCOT).

Further discussion is suggested on the dynamic performance of frequency response, management of frequency stability and prevention of load shedding including the timeframe of the frequency response, use of PSCAD and PSS/E models as well as benefits and risks associated with the modeling approach.

Concerning short-circuit current ratios:

-ERCOT found that a ratio below 1.5 is a gray area. The study determined that different load and wind conditions will produce different ratio results. Therefore, the ratio is no longer a catch-all assumption. Suggestion to look at the AEMO system as an example, as they use synchronous condensers.

-HECO studies investigated short-circuit current at the transmission level and down to the distribution level to determine if that is enough for transient voltage stability.

Identifying the protection needs of system:

-HECO does not have a metric currently, further analyses for synchronous condensers and ideas on how those resources could be located and best utilized will help to identify protection needs.

Protection measures that are being studied:

-HECO is looking at what is the minimum and maximum MVA at the transformer level and where the needs are for fault current. We are seeing slow

fault-clearing times at the 23kV level.

IV. Soft Launch NWA Opportunity

Thoughts on the 5-minute anti-islanding issue during an outage:

-The load transfer doesn't occur for about 12-seconds from one transformer to another during an outage. According to IEEE 1547, the inverter trips off and doesn't return to service for 5-minutes, once the system can regain frequency and voltage stability.

-The TAP commented that the inverters would be offline for about 5-7 minutes after an outage. Some of the newer inverters may have adjustable settings. The inverters have a restarting sequence, so they will never immediately come back online after a trip.

On not allowing an inverter to ride through a 12-second event since the breaker reclosing is not desirable for an energized line:

-The TAP commented that it would be impossible for an inverter to return to service and remain synchronous with a zero voltage on the circuit during an outage. This would require further detailed analyses of the inverter's behavior in this situation.

V. Unit Retirements for IGP

Discussion on retirement of existing thermal generating units:

-There may be a greater need during an event to have additional resources available to provide the capabilities that an exhausted PV plus storage resource cannot do once it runs out of generation (e.g., no sun, battery is fully discharged). An example solution could be a biomass plant, where you could burn more fuel to provide the additional services.

-The TAP commented that hydrogen development is still way off from being useable in a cost-effective manner. It also requires energy to make hydrogen. In addition, noted that biofuel has a limited shelf life.

VI. Revised Draft IGP Sourcing Process

- Comment from the TAP was that NWA procurements generally occur on an annual basis based on identified grid needs.

-There is a need to look ahead. If there are needs that can be addressed earlier through programs, then the NWA procurement process would have to start sooner. There is recognition that one year may not be enough time for a DER aggregator to obtain the subscriptions necessary to bid into an NWA procurement.

VII. Additional Comments

-The TAP appreciated that the criteria outlines were provided to facilitate feedback. Draft criteria provided in advance to meetings have allowed for offline review and has worked well.

Next Steps

- Next Meeting; November 19, 9:00 a.m. – 11:00 a.m.
    - WebEx
    - A meeting room will be provided for those already on island
    - Topics:
        - Further discussion on unit retirements
        - Review the proposed system needs identification process
        - Review the proposed evaluation process for the Soft Launch RFP