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Technical Panel Education Session: Upcoming Market Rule Amendment for Real-Time Monitoring Changes

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Purpose and Summary

- Purpose of Item
  - Information and education on proposed market rule amendments related to changes to IESO monitoring requirements

- Summary
  - Market rule amendments are required to enhance the IESO's situational awareness which is critical to maintaining reliability and resiliency with an increasingly dynamic power system

Market Rule Amendment Background

Background

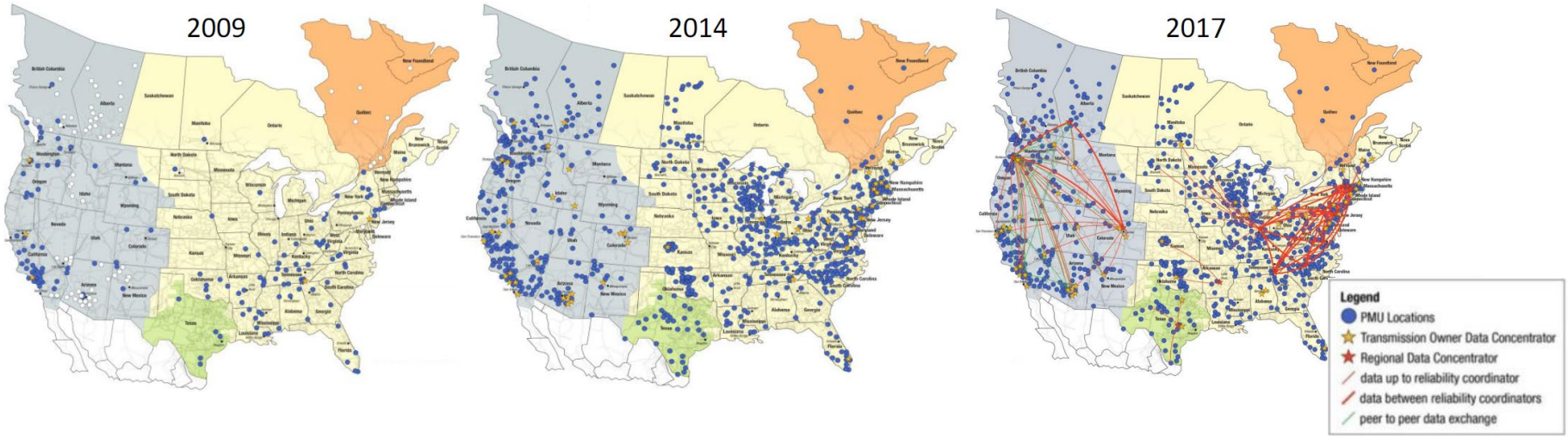
- Effective use of Phasor Measurement Unit (PMU) technology will enhance the IESO's situational awareness - a necessary step to maintaining reliability and improving resiliency as the grid transforms to become an increasingly dynamic and stressed power system
- PMU data is more comprehensive, accurate, granular, and consistent in quality than existing data supplied to the IESO; this will enable detailed health assessments of local and wide-area power systems
    - The use of PMU data also facilitates sharing and viewing a wider portion of the interconnected grid for Ontario and neighbouring jurisdictions

Background continued

- Consistent with how this maturing technology is increasingly being relied upon by other Reliability Coordinators, the IESO will integrate PMU data into our off-line, near-term and real-time systems
- PMU data will improve the IESO's ability to demonstrate reliability standards compliance
  - North American Electric Reliability Corporation (NERC) published a reliability guideline for PMU placement and future related reliability standards are anticipated

Background continued

PMU Deployments in North America are growing



Source: North American Synchrophasor Initiative (NASPI)

Proposal: Role of the IESO and Market Participants

- The proposed market rule amendments will require transmitters and applicable generators to provide synchrophasor data to the IESO who will use the data for operational and planning purposes
- To provide this data, generators and transmitters will need to:
  - Create or leverage existing real-time data links with the IESO
  - Install new phasor measurement units or leverage existing devices/equipment

Stakeholder Engagement

- The IESO launched a stakeholder engagement in Q2, 2020
- The IESO also held 1:1 meetings with certain market participants (Hydro One, Bruce Power, Ontario Power Generation) who will be most affected by the new requirements
- The revised design and draft market rules shared in September 2021 were updated based on stakeholder feedback from these earlier sessions and meetings

Next Steps

- The IESO proposes to bring draft market rules to Technical Panel in Q1 2022
- The IESO is targeting Q2 2022 for adoption by the IESO Board
- As part of the market rules implementation plan, IESO staff will develop plans for when market participants needing to install more than one PMU will need to start providing real-time monitoring data
- This ensures that market participants have appropriate time to implement processes and solutions on their side

Appendix A: Summary of Proposed Market Rule Amendments

Appendix: Proposed Requirements for Generators

(1) Single Generator Unit ≥ 100 MVA (name-plate rating)

Frequency and positive sequence voltage & current phasors from unit terminal

(2) Aggregated Generator Facility ≥ 100 MVA (aggregate name-plate rating)

Frequency and positive sequence voltage & aggregated current phasors from customer side of connection point to the grid

Generators in (1) and (2) <u>are</u> not required to provide the synchrophasor data if:
The generation facility is not a Bulk Power System station and has no connection point voltage > 200 kV.
Generators in (1) and (2) <u>may</u> not be required to provide the synchrophasor data if (*):
(a) An existing generation facility is scheduled to be deregistered within a period of 5 years from date of the effective date of the proposed market rules.
(b) The annual gross capacity factor of the generation facility is significantly low.

(*) *The applicability of items (a) and (b) above are subject to the IESO's periodic review and assessment of the decommissioning plan and evaluation of capacity factors respectively, on a case-by-case basis.*

Appendix: Proposed Requirements for Generators cont.

(3) Generation facility output is a part of an Interconnection Reliability Operating Limits (IROL) definition regardless of size

For generation units, regardless of rated size, whose output power flow is a part of an Interconnection Reliability Operating Limit (IROL) definition, provide positive sequence voltage phasor, positive sequence current phasor and frequency at the terminals defining the IROL. This requirement will take precedence even if a facility meets any of the applicability criteria (a) and (b) listed in the previous slide.

Appendix: Proposed Requirements for Transmitters

Equipment Type	Monitored Quantities
500 kV Stations, Bulk Power Stations, Stations in Grid Restoration Paths	Frequency and positive sequence voltage phasor from two separate buses
Circuits defining Interconnection Reliability Operating Limits (IROL) and interties	Frequency and positive sequence voltage & current phasors from circuit terminal
SVCs, Static Synchronous Condensers and STATCOMs	Frequency and positive sequence voltage & current phasors from unit terminal