Relocating the IESO Proxy Bus

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Agenda

- Background
- Problem/Opportunity
- Analysis of IESO-NY Interchange
- Proposal
- Next Steps

Background

Background

- **A proxy (generator) bus is defined as per the OATT as one located outside the NYCA that is selected by the ISO to represent a typical bus in an adjacent Control Area and at which LBMP prices are calculated.**
  - The BRUCE facility is the current proxy bus for IESO in the NYISO market systems
- **Selection of an external proxy bus is done with a goal to be the best approximation for where marginal changes in generation will occur in response to marginal changes in net interchange**
  - Analysis of the relationship between changes in flows and changes in net interchange over time is a technique used to determine a location for an external proxy bus

Problem/Opportunity

- **The NYISO's market software currently uses the BRUCE station as the proxy bus to schedule transactions with Ontario's Independent Electric System Operator (IESO).**
  - The selection of the BRUCE station as the location of the IESO proxy bus is the determining factor for how the market software distributes the power flow for scheduled energy between IESO and NYISO.
- **Analysis of the more recent actual historical delivered energy from transactions between IESO and NYISO indicate a potential improvement that can be made with the power flow results from the NYISO's market software.**
  - Historically, ~85%-95% of the scheduled energy between IESO and NYISO is realized over the six direct tie-lines between IESO and NYISO, as compared to the ~70%-85% that is expected by the market software when it is making scheduling decisions.

Analysis of Net IESO-NY interchange

- **The historical scheduled IESO-NY interchange realized over the six direct tie-lines between IESO and NYISO has been reviewed for the years following the commercial operation of the Ontario-Michigan PARs**
  - The Ontario-Michigan PARs began being operated to control that interface on July 18, 2012
- **The operation of the Ontario-Michigan PARs to better conform actual power flows to scheduled power flows at the Ontario-Michigan interface has resulted in more IESO-NY interchange being delivered directly to New York (in the range of 85%-95%), rather than looping around Lake Erie**
- **However, the NYISO's energy market software schedules IESO-NY interchange with power flows that anticipate only ~70%-85% of power will be delivered directly**
  - The schedules for IESO-NY interchange assume more counter-clockwise Lake Erie loop flow than actually occurs

Proposal

- **A number of locations within IESO were reviewed and tested for the fit as the external proxy bus using the following criteria:**
  - A bus on which the generators with the maximum active power generation is located with preference given to higher kV buses
- **The marginal generation impact of the top 3 locations was determined from a distribution factor analysis under all-lines-in service conditions**
  - BRUCE 500kV (current external proxy bus) has a marginal impact of ~73%
  - BECK 220kV has a marginal impact of ~87%
  - HAWTHORN 220kV has a marginal impact of ~73%
- **The analysis indicates BECK 220kV is a more optimal proxy bus for IESO scheduling as compared to BRUCE 500kV.**
  - The marginal impact from BECK (~87%)is more aligned with real-time operations (85%-95%)

Addendum: Interface-Direct tie analysis (all-lines-in service condition)

- **The six (6) IESO-NY ties comprising the IESO-NY interface are split into two groups:**
  - PAR controlled ties which control power flow irrespective of the external proxy bus location
    - St. Lawrence 230kV L33P
    - St. Lawrence 230kV L34P
  - Free flow ties whose power flow is affected by the external proxy bus location
    - Beck-Niagara 345kV (PA301)
    - Beck-Niagara 345kV (PA302)
    - Beck-Niagara 230kV (PA27)
    - Beck-Packard 230kV (BP76)
- **The distribution factor analysis shows an improvement in the alignment to real-time operations when the IESO proxy bus is moved from BRUCE to BECK.**
  - The improvements were consistent and symmetric across the 4 free flow ties
  - The alignment to real-time operations improved on each of the 4 free flow ties. In aggregate, the improvement was approximately 30%

Addendum: Interface-Direct tie analysis (all-lines-in service condition)

- The distribution of scheduled IESO-NY interchange among the four (4) free flow ties are:

Facility Name	Average Historical SF	Current BRUCE	Proposed BECK
Beck-Niagara 345kV (PA301)	23%	15%	22%
Beck-Niagara 345kV (PA302)	23%	15%	22%
Beck-Niagara 230kV (PA27)	12%	7%	12%
Beck-Packard 230kV (BP76)	16%	7%	11%

- The balance of scheduled interchange realized over the tie lines that make up the IESO-NY interface is facilitated by the St. Lawrence 230kV L33P and L34P PAR controlled lines.

Next Steps

- Estimated timeline of April 2020 to make the switch from BRUCE to BECK in the NYISO energy market systems
  - Timeline is our best estimate given current 2020 project priorities
- Tariff Updates (2) that refer to OH_GEN_BRUCE as the IESO proxy bus that need to be updated
  - A table in section 4.4.4 of the MST listing Proxy Generator Buses under Ontario
    - OH_GEN_PROXY~~BRUCE~~
    - OH_LOAD_PROXY~~BRUCE~~
  - A table in section 17.1.5 of the MST that lists External Zone Proxy Generator Buses
    - OH_GEN_PROXY~~BRUCE~~
- Several external facing postings/screens may continue to display the name "OH_GEN_BRUCE" following the relocation of the proxy bus until relevant software changes can be implemented.

Questions?

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system