Impacts of Updated Maine (ME) Interface Transfer Limits to Transmission Transfer Capabilities

Planning Advisory Committee

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Topics

- Review of updated ME interface transfer limits
- Review of interface transfer capabilities
  - Internal Interfaces
  - External Interfaces
- Review of updated NB-NE interface capacity import capability

REVIEW OF UPDATES TO ME INTERFACE TRANSFER LIMITS

Review of Updates to ME Interface Transfer Limits

- The ISO presented transfer limit updates in ME (including for the Surowiec-South and ME-NH interfaces) at the June 2024 Planning Advisory Committee (PAC) meeting
  - The updated transfer limits were due to changes to NPCC Document A-10, resulting in transfer limits that were separated from NPCC Bulk Power System testing
- The ISO presented further transfer limit updates to these two interfaces at the December 2024 PAC meeting
  - The updated transfer limits are due to the interconnection of the New England Clean Energy Connect (NECEC) and its upgrades, and were determined assuming NECEC online
  - The ISO did not present updated transfer limits with NECEC offline at that time since it had not yet performed analysis with NECEC offline

Review of Updates to ME Interface Transfer Limits (cont'd)

Interface	June 2024 Presented Transfer Limit (MW)*	December 2024 Presented Transfer Limit (MW)*, NECEC Online	Difference (MW)
Surowiec-South	1,800	2,800	+1000
ME-New Hampshire (NH)	2,000	2,200	+200

**Values shown include operating margin as required.*

Impacts of NECEC on ME Transfer Limits

- NECEC uses voltage source converter HVDC technology, which can provide dynamic reactive power support
  - Dynamic reactive power support can improve system dynamic performance, which can potentially increase transfer capabilities
- Since NECEC is being interconnected with Network Import Interconnection Service (NIIS), and not with Capacity Network Import Interconnection Service (CNIIS), any impacts to ME interface transfer capabilities that support Forward Capacity Market (FCM) activities:
  - Cannot consider NECEC online
  - Can consider NECEC related Network Upgrades in-service, since those upgrades will be online independent of NECEC's online status

Impacts of NECEC on ME Transfer Limits (cont'd)

- The analyses supporting the ME interface transfer limit increases when NECEC is online presented at the December 2024 PAC meeting were re-run with NECEC offline
- The NECEC offline analyses showed:
  - A reduction only to the Surowiec-South interface transfer limit, when compared to the NECEC online interface transfer limit increase presented in December 2024
  - An increase to the Surowiec-South interface transfer limit, when compared to the interface transfer limit presented in June 2024

Interface	June 2024 Presented Transfer Limit (MW)*	December Presented 2024 Transfer Limit (MW)*, NECEC Online	Updated Transfer Limit (MW)*, NECEC Offline
Surowiec-South	1,800	2,800	2,200

**Values shown here include operating margin as required.*

REVIEW OF INTERFACE TRANSFER CAPABILITIES

Internal Interfaces

Internal Interface Transfer Capabilities (MW)

Single-Value, Summer Peak, Non-Firm, Transmission Interface Limits for Use in Subarea Transportation Models [a]										
Interface	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Orrington-South	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Surowiec-South	1800	2200[b]	2200	2200	2200	2200	2200	2200	2200	2200
Maine-New Hampshire	2000	2200[b]	2200	2200	2200	2200	2200	2200	2200	2200
Northern New England-Scobie + 394	3450	3450	3450	3450	3450	3450	3450	3450	3450	3450
North-South	2725	2725	2725	2725	2725	2725	2725	2725	2725	2725
East-West	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
West-East	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Boston Import (N-1)	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250
Boston Import (N-1-1)	4850	4850	4850	4850	4850	4850	4850	4850	4850	4850
SEMA/RI Export	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
SEMA/RI Import (N-1)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
SEMA/RI Import (N-1-1)	800	800	800	800	800	800	800	800	800	800
Southeast New England Import (N-1)	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250
Southeast New England Import (N-1-1)	4850	4850	4850	4850	4850	4850	4850	4850	4850	4850
Connecticut Import (N-1)	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400
Connecticut Import (N-1-1)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
SW Connecticut Import (N-1)	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800
SW Connecticut Import (N-1-1)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900

Notes discussed on the following page

Notes on Internal Interface Transfer Capabilities

a) Limits are for the summer period, except where noted to be winter
   - The limits may not include possible simultaneous impacts, and should not be considered as “firm”
   - For the years within the FCM horizon (Capacity Commitment Period (CCP) 2028-2029 and earlier), only accepted certified transmission projects are included when identifying interface transfer limits
   - For the years beyond the FCM horizon (CCP 2029-2030 and later), proposed plan-approved transmission upgrades are included according to their expected in-service dates

b) The interface transfer capability increase due to NECEC related Network Upgrades in-service, but NECEC offline.

REVIEW OF INTERFACE TRANSFER CAPABILITIES

External Interfaces

External Interface Transfer Capabilities (MW)

Single-Value, Summer Peak, Non-Firm, Transmission Interface Limits for Use in Subarea Transportation Models [1]

Interface	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
New Brunswick-New England (energy import capability)[2]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
New Brunswick-New England (capacity import capability)[2]	980	1000	1000	1000	1000	1000	1000	1000	1000	1000
HQ-New England (Highgate) (energy import capability)[3]	217	217	217	217	217	217	217	217	217	217
HQ-New England (Highgate) (capacity import capability)	200	200	200	200	200	200	200	200	200	200
HQ-New England (Phase II) (energy import capability)[4]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
HQ-New England (Phase II) (capacity import capability)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
Cross-Sound Cable (CSC) (energy import capability)[5]	330	330	330	330	330	330	330	330	330	330
Cross-Sound Cable (CSC) (capacity import capability)	0	0	0	0	0	0	0	0	0	0
New York-New England (energy import capability)[6]	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
New York-New England (capacity import capability)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

Notes discussed on the following pages

Notes on External Interface Import Capability

1. Limits are for the summer period
   - The limits may not include possible simultaneous impacts, and should not be considered as “firm” (the bases for these limits are subject to more detailed review in the future)
2. The limit on scheduled energy transactions over the New Brunswick (NB)-New England (NE) interface is 1,000 MW, and updates to the transfer capabilities of interfaces in the ME Load Zone results in the ability to deliver 1000 MW of capacity to the New England Control Area (an increase of 20 MW to the previous 980 MW limit)
   - Additional information on the adjustment to the import capacity capability of this interface is provided later in this presentation
3. The capability for the Highgate facility is listed at the New England AC side of the Highgate terminal

Notes on External Interface Import Capability (cont'd)

4. The Hydro-Quebec Phase II interconnection is a DC tie with equipment ratings of 2,000 MW. Due to the need to protect for the loss of this line at full import level in the PJM and New York (NY) Control Areas' systems, ISO-NE has assumed its transfer capability for capacity and reliability calculation purposes to be 1,400 MW
   - This assumption is based on the results of loss-of-source analyses conducted by PJM and NYISO
5. Import capability on the Cross Sound Cable (CSC) is dependent on the level of local generation
6. NY interface limits
   - These are without CSC and with the Northport Norwalk Cable at 0 MW flow
   - Simultaneously importing into NE and SWCT or Connecticut can lower the NY-NE capability (very rough decrease = 200 MW)

REVIEW OF UPDATED NB-NE INTERFACE CAPACITY IMPORT CAPABILITY

Increase to the NB-NE Interface Capacity Import Capability

- As a result of the 400 MW increase to the Surowiec-South interface transfer limit, the capacity import capability of the NB-NE interface increases by 20 MW (*i.e.*, from 980 MW to 1000 MW)
  - This increase to the capacity import capability of the NB-NE interface is based on:
    a) The Surowiec-South interface transfer limit of 2,200 MW
    b) 1,968 MW of Existing Generating Capacity Resources between the Surowiec-South and NB-NE interfaces (based on Capacity Network Resource Capability (CNRC))
    c) 181 MW of Existing Demand Capacity Resources between the Surowiec-South and NB-NE interfaces (based on Capacity Supply Obligation (CSO) in the most recent FCA (*i.e.*, FCA 18))
    d) 1,330 MW of net load between the Surowiec-South and NB-NE interfaces (based on the 90/10 summer peak load and PV forecasts for 2028 from the 2024 CELT, and including non-CELT load, BTM generation other than PV and transmission losses)
  - Capacity import capability for NB-NE interface = (a) – [(b) + (c) - (d)] = 2,200 – [1,968 + 181 – 1,330] = 1380 (after accounting for rounding) > 1,000 MW limit on scheduled energy transactions over the NB – NE interface

Increase to the NB-NE Interface Capacity Import Capability (cont'd)

- When considering the updated transfer capability of the Surowiec-South Interface, the potential capacity import capability for the NB-NE interface is greater than the 1,000 MW limit on scheduled energy transactions over the NB-NE interface, and therefore the updated Surowiec-South interface transfer capability does not limit the increase to the NB-NE capacity import capability up to the 1,000 MW limit
  - As previously covered, no other ME interfaces were limiting increases to the NB-NE interface import capability

Implementation of Interface Transfer Capabilities in the FCM

- The transfer capabilities listed in this presentation, including the updated transfer capabilities for the Surowiec-South and NB-NE interfaces, will be used in FCM related activities going forward, including:
  - The overlapping interconnection impacts analysis performed for the 2025 interim reconfiguration auction qualification process
    - Through this analysis, the ISO will determine whether there is sufficient capacity capability to qualify any proposed New Capacity Resources (where this analysis will consider the latest available data, including load forecast data)
  - The calculation of the Installed Capacity Requirements and related values for annual reconfiguration auctions (ARAs) to be conducted in 2026
    - Tie benefits for 2026-2027 CCP ARA 3
    - Zonal demand curves

Questions

APPENDIX

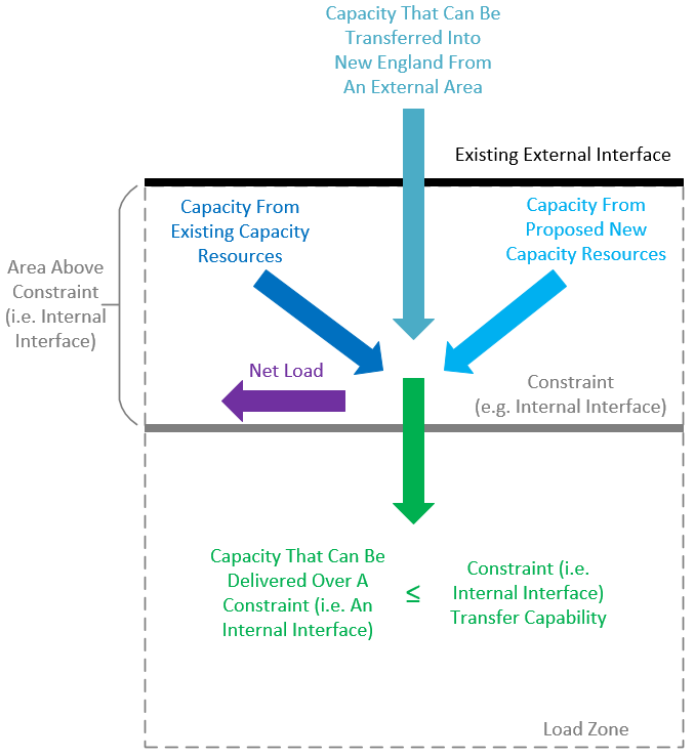
Methodology for Analysis of the Delivery of Capacity

External Import Capability Determinations For Use in the Forward Capacity Market (FCM)

- From Tariff Section III.12.9.2.4:
  - The import capability of all external interconnections with New England will be determined using studies of system conditions expected during the Capacity Commitment Period:
    - Forecast 90/10 peak load conditions (includes behind the meter PV)
    - Existing Generating Capacity Resources at their CNRC
    - Existing Demand Capacity Resources reflecting their CSO
    - Stressed Transfers
  - The system will be modeled in a manner that reflects the design of the interconnection
    - If an interconnection and its supporting system upgrades were designed to provide incremental capacity into the New England Control Area, simulations will assume imports up to the level that the interconnection was designed to support
    - If the interconnection was not designed to be comparably integrated, simulations will determine the amount of power that can be delivered into New England over the interconnection

Analysis of the Delivery of Capacity

- The amount of capacity that can be delivered over a constraint (*i.e.*, an internal interface) within a Load Zone is the sum of capacity above the constraint minus net load above the constraint, and is limited by the transfer capability of the constraint
  - Capacity can come from Existing Capacity Resources, proposed New Capacity Resources, and capacity that can be transferred into New England over an existing external interface



Analysis of the Delivery of Capacity (cont'd)

- To analyze the potential for the delivery of capacity over an **existing external interface** into New England:
  - For the study year and load level:
    - Turn on New England Existing Generating Capacity Resources to their CNRC
    - Turn on Existing Demand Capacity Resources
    - Identify how much can be transferred into New England over the existing external interface before reaching a constraint (*i.e.*, an internal interface transfer limit)
  - In other words, the methodology to determine the potential delivery of capacity over an existing external interface compares the sum of Existing Capacity Resources above the applicable constraint, minus the net load above the applicable constraint, up to the applicable constraint's limit
- This is the analysis used by the ISO to determine the capacity import capability of the NB-NE interface

Analysis of the Delivery of Capacity (cont'd)

- To analyze the potential to qualify new capacity **within New England**:
  - For the study year and load level:
    - Turn on Existing Generating Capacity Resources to their CNRC
    - Turn on Existing Demand Capacity Resources
    - Increase imports up to their potential limit or until an internal interface constrains
    - Identify if there is any remaining headroom to qualify new internal capacity
  - In other words, the potential to qualify new capacity within New England above the applicable constraint depends on the availability of headroom for the applicable constraint after consideration of Existing Capacity Resources in New England and capacity delivered over external interfaces
- The ISO performs this overlapping interconnection impacts analysis as part of an FCA qualification process or an interim reconfiguration auction qualification process

Analysis of the Delivery of Capacity (cont'd)

- Consistent with Tariff Section III.12.9.2.4, the established methodology of the delivery of capacity considers Existing Capacity Resources in New England and increasing the capacity import capability of any upstream external interfaces when the transfer capability of an internal interface associated with constrained capacity increases
  - For example, in its answer to protests on its FCA 6 informational filing*, the ISO explained that the Orrington-South interface transfer limit increase from 1,200 MW to 1,325 MW as a result of the ME Power Reliability Program (MPRP) did not result in the qualification of any New Capacity Resources in New England north of the Orrington-South interface when considering Existing Capacity Resources, because there was no capability left to accommodate New Capacity Resources north of the interface after first considering the amount of Existing Capacity Resources and load above of the interface, and the potential capacity import capability of the NB-NE interface
    - In its order accepting the ISO's FCA 6 informational filing, FERC found that the ISO demonstrated that the MPRP did not increase the transfer capability of the Orrington-South interface sufficiently to qualify New Capacity Resources in New England**

*Submitted to FERC on February 13, 2012, Docket No. ER12-757-000.
**ISO New England Inc., 138 FERC ¶ 61,196 (2012) at P 44.