

**ISO New England
Transmission Reliability Margin
Implementation Document
(TRMID)**

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Record of Revisions

Version	Date	Reason
1.0	April 1, 2011	Baseline document
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1. Introduction

ISO is the regional transmission organization (RTO) for the New England Control Area. The New England Control Area includes the transmission system located in the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, but does not include the transmission system in northern Maine (i.e., Aroostook and parts of Penobscot and Washington Counties) that is radially connected to New Brunswick and administered by the Northern Maine Independent System Administrator. The New England Control Area is comprised of PTF, non-PTF, OTF, MTF, and is interconnected to three neighboring Balancing Authority Areas (“BAA”) with various interface types as shown in the Table 1. A graphical depiction of the New England Control Area and its interfaces is provided in Figure 1.

Table 1. New England Control Area interfaces with neighboring BAAs

Neighboring BAA (“NBAA”)	Interface	Interface Type
New Brunswick System Operator BAA	New England - New Brunswick	PTF – NBAA (external)
Hydro-Quebec TransEnergie BAA	New England – Hydro Quebec via the Phase I/II high voltage direct current (“HVDC”) Transmission Facilities	OTF – NBAA (external)
	New England PTF - Phase I/II HVDC Transmission Facilities	PTF – OTF (internal)
Hydro-Quebec TransEnergie BAA	New England - Hydro Quebec via the Highgate Transmission Facility	PTF – NBAA (external)
New York Independent System Operator BAA	New England - New York-AC	PTF – NBAA (external)
New York Independent System Operator BAA	New England - New York via the Northport - Norwalk Harbor Cable (“NNC”) Transmission Facility	PTF – NBAA (external)
New York Independent System Operator BAA	New England – New York via the Cross Sound Cable (“CSC”) transmission facility	MTF – NBAA (external)
	New England PTF – CSC transmission facility	PTF – MTF (internal)

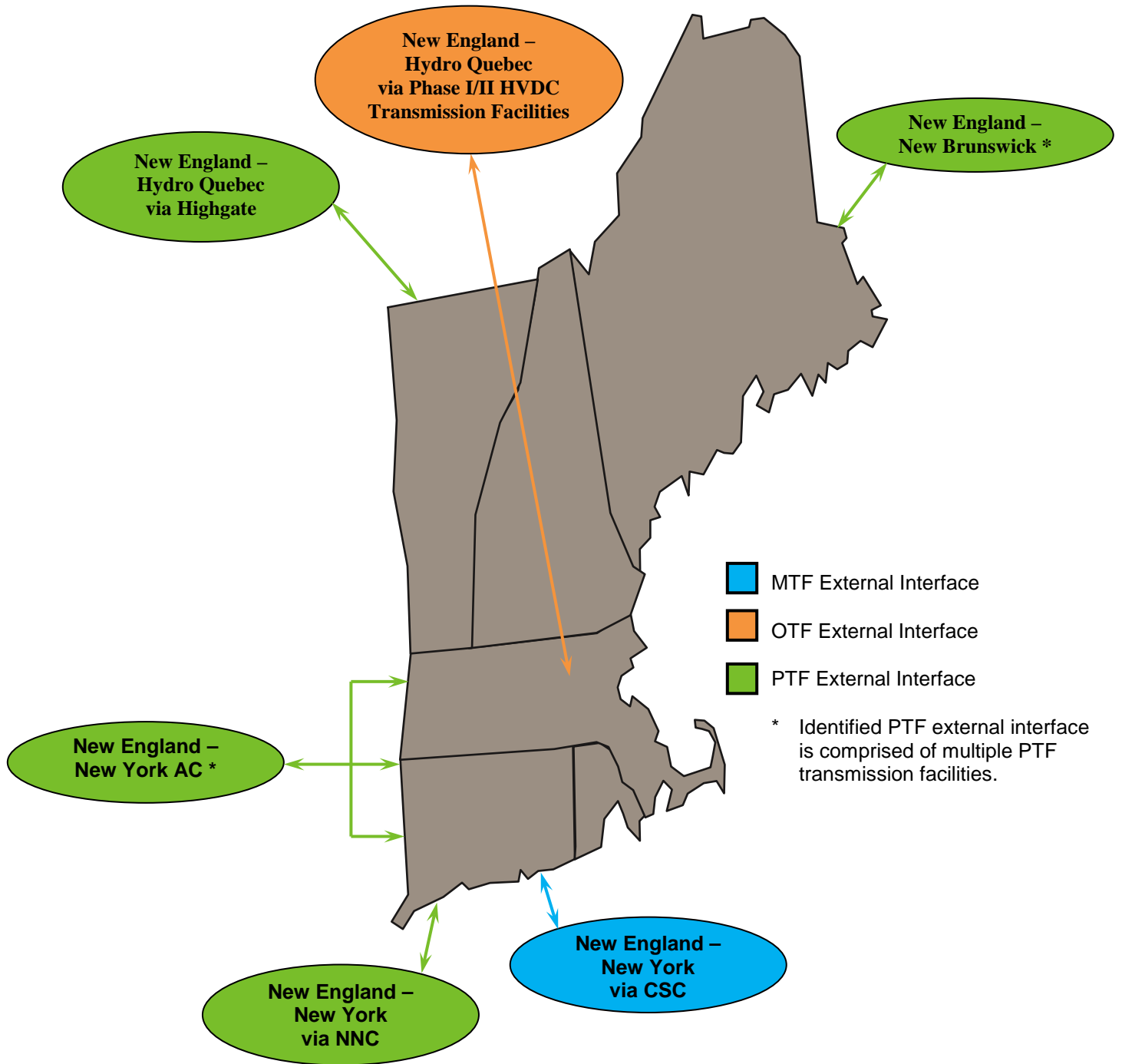


Figure 1. Graphical representation of New England Control Area external interfaces with neighboring BAAs

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As part of its RTO responsibilities, the ISO is registered with the North American Electric Reliability Corporation (“NERC”) as several functional model entities that have responsibilities related to the calculation of ATC as defined in the following NERC Standards: MOD-001 – Available Transmission System Capability (“MOD-001”), MOD-004 – Capacity Benefit Margin (“MOD-004”), and MOD-008 – Transmission Reliability Margin Calculation Methodology (“MOD-008”). The extent of those responsibilities is based on various Commission approved transmission operating agreements and the provisions of the ISO New England Operating Documents. Table 2 below depicts those responsibilities as they apply to the interfaces associated with New England Control Area and its neighboring BAAs for which the ISO is the Transmission Operator (“TOP”) and has varying responsibilities with respect to the calculation of ATC over those interfaces. This TRMID describes the methodology used by the ISO to determine TRM for the interfaces listed in Table 2 below.

Table 2. New England Control Area Internal and External Interfaces

Interface	Interface Type	ATC	TTC	TRM
New England - New Brunswick	PTF – NBAA (external)	ISO as Transmission Service Provider (“TSP”)	ISO as TOP	ISO as TOP
New England – Hydro Quebec via the Phase I/II HVDC Transmission Facilities	OTF – NBAA (external)	Schedule 20A Service Providers (“SSPs”) as TSPs per Schedule 20A	ISO as TOP	ISO as TOP
New England PTF - Phase I/II HVDC Transmission Facilities	PTF – OTF (internal)	ISO as TSP	ISO as TOP	ISO as TOP
New England - Hydro Quebec via the Highgate Transmission Facility	PTF – NBAA (external)	ISO as TSP	ISO as TOP	ISO as TOP
New England - New York-AC	PTF – NBAA (external)	ISO as TSP	ISO as TOP	ISO as TOP
New England - New York via the Northport - NNC Transmission Facility	PTF – NBAA (external)	ISO as TSP	ISO as TOP	ISO as TOP
New England – New York via the CSC transmission facility	MTF – NBAA (external)	Cross Sound Cable Company, LLC (“CSC, LLC”) as TSP per Schedule 18	ISO as TOP	ISO as TOP
New England PTF – CSC transmission facility	PTF – MTF (internal)	ISO as TSP	ISO as TOP	ISO as TOP

2. Calculation of TRM on PTF Interfaces

The ISO, acting as the Transmission Operator and Transmission Service Provider, does not set aside TRM on PTF external interfaces or PTF/MTF and PTF/OTF internal interfaces. A TRM value of zero (0) shall be used in the ATC calculations for those interfaces.

3. Calculation of TRM on MTF and OTF External Interfaces

The ISO, acting as the Transmission Operator, calculates the TRM on the MTF and OTF external interfaces, which are both high voltage direct current (“HVDC”) transmission facilities, by taking into account any operational uncertainties associated with the external facility in accordance with MOD-008.

The Transmission Service Providers responsible for calculating the ATC and providing transmission service over the MTF or OTF dictate how the ISO-calculated TRM is applied in their respective Schedule-specific ATC calculations.

A. TRM for the MTF

Typically, the operational uncertainties associated with an external HVDC transmission facility are minimal and result in a TRM value of zero (0). Therefore, the TRM value for the MTF (i.e., CSC transmission facility) is zero (0).

B. TRM for the OTF

i. HQ to NE TRM for the Phase I/II HVDC-TF:

There are operational uncertainties associated with the Phase I/II HVDC Transmission Facilities that arise out of neighboring and nearby BAAs such that the TRM on this facility is not zero (0). Due to the large transfer capability of the Phase I/II HVDC Transmission Facilities and the geographic location of the New England Control Area with respect to the rest of the Eastern Interconnection, the loss of this facility may have a substantial impact on the New York and Pennsylvania, New Jersey and Maryland (“PJM”) transmission systems. The inertial impact from the loss of the Phase I/II HVDC Transmission Facilities on the New York and PJM transmission systems will be dependent upon the simultaneous path interactions and the generation

dispatch on those transmission systems and within the New England Control Area.

As such, pursuant to Attachment G of the ISO Tariff, the Reliability Coordinators in New York and PJM can require the ISO to limit the amount of energy transferred into the New England Control Area over the Phase I/II HVDC Transmission Facilities (or the output from other large source contingencies within the New England Control Area) in Real-Time to a value as low as 1200 MW, which is referred to as the “largest source contingency limit”. The amount of energy transferred into the New England Control Area over the Phase I/II HVDC Transmission Facilities is not always limited to 1200 MW; it is also dependent upon the dynamic state of the New York and PJM transmission systems, as well as, the additional room (or “available margin”) on those systems that can reliably sustain the inertial response following the loss of the Phase I/II HVDC Transmission Facilities (or other large source contingencies within the New England Control Area) when the amount of energy transferred into the New England Control Area over the Phase I/II HVDC Transmission Facilities (or the output from other large source contingencies within the New England Control Area) in Real-Time is in amounts greater than 1200 MW. For these reasons, the TRM value for the Phase I/II HVDC Transmission Facilities for all time horizons in the importing direction (North to South) shall be between zero (0) MW and 800 MW, where 800 MW is calculated from the “Phase I/II HVDC Transmission Facilities maximum transfer capability” (which is 2000 MW) minus the “largest single source contingency limit” (which is 1200 MW).

This range of TRM values is not dependent upon any databases, but instead is driven by the magnitude of the largest single source contingency in the New England Control Area that the New York and PJM transmission systems is able to sustain following the loss of the largest contingent resource.

ii. NE to HQ TRM for the Phase I/II HVDC-TF:

When energy is flowing from the New England Control Area to the Hydro-Quebec TransEnergie Balancing Authority Area (South to North) over the Phase I/II HVDC Transmission Facilities, Hydro-Quebec TransEnergie may restrict the energy flow

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due to uncertainties on their Hydro-Quebec TransEnergie transmission system. The ISO considers whatever Hydro-Quebec TransEnergie restrictions are submitted to it in the calculation of the New England to Quebec TRM for the Phase I/II HVDC Transmission Facilities. This results in a TRM calculation in the exporting direction that equals the [maximum transfer capability – HQTE largest single source contingency]; [1200 MW – 1000 MW = 200 MW].