Introduction

This document includes the following information:

- Basic explanations of TTC, ATC, and TRM
- List of Central Maine Power Company (CMP) interfaces and forecast/posting responsibilities
- Methods of determining TTC and TRM for each interface
- Information about the posting of TTC and ATC values for the Central Maine Power Company (CMP) interfaces, including the timeframes and frequency of updates

Basic Concepts and Definitions

Total Transfer Capability (TTC)

NERC Definition

The Total Transfer Capability (TTC) for an interface is the best engineering estimate of the total amount of electric power that can be transferred over the interface in a reliable manner in a given time-frame.

Basis for TTC

TTCs for Central Maine Power Company (CMP) interfaces are forecast by the ISO based on thermal, voltage, and/or stability limitations of the ties that comprise the interface. Power flow and transient stability analysis is used to ensure that physical limits will not be violated for credible contingencies per NPCC and NEPOOL reliability criteria.

Future Forecasts

The TTC forecast for periods beyond 40 days out is based on seasonal operating studies that take into account anticipated peak loads and generator maintenance schedules.

*Within 40 days*, a base TTC is calculated from historical “all lines in” data that takes into account seasonal load distributions. The base TTC is adjusted daily into a forecast value that accounts for:

- forecast loads
Central Maine Power Company - TTC/TRM/ATC Document

- actual and scheduled transmission and generator outages in NEPOOL and neighboring systems
- changes in facility ratings
- anticipated loading of generators
- anticipated inter-Area schedules or bids and offers for the Market System.

Variations across interfaces Factors used in calculating TTC for each of the Central Maine Power Company interfaces vary.

ISO/Transmission Provider Responsibility

The ISO calculates the forecast TTC for Central Maine Power Company.

Individual Transmission Providers use the forecast TTCs according to their OASIS posting requirements.

Transmission Reliability Margin (TRM)

Definition

The Transmission Reliability Margin (TRM) is the portion of TTC that cannot be used for reservation of firm transmission service because of uncertainties in system operation. It is used for interfaces requiring a physical reservation.

The TRM is available for reservation of non-firm transmission service. Note that when TRM = TTC, no firm transmission reservations can be made on the tie. Non-firm reservations can be made up to the value of TTC.

Variability of TRM The TRMs are interface-dependent, direction-specific and time-dependent.

ISO/Transmission Provider Responsibility

The ISO calculates Physical based services TRM for the Central Maine Power Company dependant on forecasted system conditions and the interface.

Individual Transmission Providers use the forecast TRMs according to their OASIS posting requirements.

Available Transfer Capability (ATC)

Definition of Firm ATC

Firm Available Transfer Capability (Firm ATC) for an interface is the capability for firm transmission reservations that remains after allowing for existing firm commitments and the TRM.

Mathematically, Firm ATC is calculated using the equation:

\[
\text{Firm ATC} = \text{TTC} - \text{TRM} - \text{Existing Firm Commitments} \ast.
\]
* Existing Firm Commitments consist of, Firm transmission requests in the following status, Confirmed, Accepted and Study.

**Definition of Non-Firm ATC**

Non-Firm Available Transfer Capability (Non-Firm ATC) for an interface is the capability for non-firm transmission reservations that remains after allowing for existing commitments in the Confirmed and Accepted status. Mathematically, Non-Firm ATC is calculated using the equation:

\[
\text{Non-Firm ATC} = \text{TTC} - \text{Existing Firm Commitment Schedules} & \text{Non-Firm Commitments in the Confirmed Status.}
\]

**Study Reservations**

Requests for service that are in the Study Status are excluded from the calculation of Non-Firm ATC.

**Non-Firm ATC = a negative number**

The ISO will, on occasion, show negative ATC. Negative ATC in the market-based system can be an indication of increased demand for transactions flowing in a particular direction. Since ATC will not limit the amount of transaction to be considered for scheduling, there could be times when ATC indicates a substantially negative value. It must be recognized that a negative ATC should not discourage the submittal of a transaction, as the economic evaluation of these schedules has not taken place. It is this economic evaluation that will assure that transfer limits are honored.

**Non-Firm ATC in the Operating Horizon**

Calculation of ATC in the Operating Horizon for Non-Firm Service is based on the maximum availability of the energy to be scheduled as opposed to the reserved transmission service. This effectively releases any unscheduled transmission service up to the TTC (no overbooking is allowed). Mathematically, Non-Firm ATC in the Operating Horizon is calculated using the equation:

\[
\text{Non-Firm ATC} = \text{TTC} - \text{Existing Firm Commitment Schedules} & \text{Non-Firm Commitment Schedules.}
\]
Capacity Benefit Margin (CBM), Not Included for Central Maine Power Company

For Central Maine Power Company, ‘Existing Firm Commitments’ means the existing firm transmission reservations. Central Maine Power Company does not include a CBM component in any ATC calculations, because the CBM is reflected in the capacity requirements of load-serving entities.

If the capacity planning methods at Central Maine Power Company change in the future, the value of the CBM component in the ATC calculations will be re-evaluated.

Transmission Provider Responsibility
Central Maine Power Company calculates and updates Firm and Non-Firm ATCs for service.
Central Maine Power Company Interfaces

The interfaces for which ATC values are currently posted on the CMP, NEPOOL OASIS node are listed in the table below. Some of these interfaces consist of a single tie and others have multiple ties. The ISO determines the TTC and TRM for each interface. The Transmission Providers determine the ATCs based on existing commitments and posts the values for TTC and ATCs on their individual OASIS sites.

Table: Central Maine Power Company Interfaces

<table>
<thead>
<tr>
<th>Interface</th>
<th>Transmission Providers</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE HVDC Border - PHASE I/II (HQ-NE; NE-HQ)</td>
<td>Individual owners of the HVDC tie</td>
<td>Phase I &amp;II, ATC forecasted by individual owners.</td>
</tr>
</tbody>
</table>

TTC and TRM for Central Maine Power Company Interfaces

This section describes considerations used in determining TTC and TRM for each of the Central Maine Power Company interfaces.

Phase I/II (Hydro Quebec)

Base values of the TTC for this interface are determined utilizing historical “all lines in” transfer limit data. This data takes into account such diverse factors as seasonal load distribution and facility ratings, load levels, thermal and stability limits, and other factors that typically influence interface transfer limits.

Table: TTC and TRM for Phase I/II (Hydro Quebec)

<table>
<thead>
<tr>
<th>Import TTC</th>
<th>Import TRM</th>
<th>Import CBM</th>
<th>Export TTC</th>
<th>Export TRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1200</td>
<td>0</td>
<td>1200</td>
<td>500</td>
</tr>
</tbody>
</table>

NOTE: Phase I & II cannot operate simultaneously. Normal operation is over the Phase II facility.
Determination and Posting of TTC & ATC

Location of Postings

TTC and ATC values are posted on Central Maine Power Company’s NEPOOL OASIS web page. Some interfaces are posted by more than one Transmission Provider, such as, Phase I/II where there is joint ownership.

Updates to TTC and ATC

TTC and TRM values are calculated and posted for each of the following time frames:

- Hourly
- Daily
- Weekly
- Monthly
- Yearly

Base TTC values for the longer term postings are determined using an “all lines in” normal system configuration. Closer to real time, changes to the normal configuration as a result of scheduled maintenance or unscheduled outages are known and can result in more or less restrictive transfer limitations.

Short term analysis may be performed to assess the effects of outages and other changes on base TTCs. Adjustments to the base TTC values are made to nearer term values as appropriate to reflect the changes in limitations.

Updates to TTC

The ISO evaluates all TTC values, with the exception of yearly values, for each interface a minimum of once per business day and whenever changes in system conditions warrant.

Posted TTC and ATC values

Hourly TTCs & ATCs:

Twenty-four (24) hourly TTC and Non-Firm Hourly ATC values are provided for the current day, plus the next 11 days, for each interface.

Adjustments made to the base TTC values for posted interfaces can be seen in hour-by-hour detail.

The Hourly TTC is the MINIMUM TTC for that Hour.
### Daily TTCs & ATCs:

TTC, Firm ATC, and Non-Firm ATC values for the current day plus the next 39 days are summarized for all interfaces.

The TTC values for the first 8 days in this group are adjusted for hourly maintenance and details can be viewed in the Hourly TTC section. Days 9 through 40 use historical data base TTC values.

### Weekly TTCs & ATCs:

The Daily TTC is the MINIMUM Hourly TTC for the Day.

TTC, Firm ATC, and Non-firm ATC values are shown for the current week plus the next 12 weeks for each interface.

A week always starts at 0001 on a Monday and ends hour ending 24 on the following Sunday.

Note that the TTC values for the first 5 weeks (made up of the current week plus the next 4 weeks) will reflect adjustments made for known hourly or daily maintenance. The remaining weeks (6 through 13) use TTC values from the historical data base except if maintenance is scheduled that would effect any of those weeks in their entirety.

The Weekly TTC is the MAXIMUM Daily TTC for the 7-day week.

### Monthly TTCs & ATCs:

The monthly TTC and ATC values cover the current month and the next 12 months for a total of 13 calendar months. Each interface has the **MAXIMUM** TTC value posted which is based on the historical data.

If maintenance is scheduled for an entire month the Monthly TTCs will reflect it here.

The Monthly TTC is the MAXIMUM Daily TTC for the month.

### Yearly TTCs & ATCs:

Values for the Yearly TTC reflect 2 years beyond the current year.

Yearly TTC is the MAXIMUM value between summer and winter analysis for the year.
Reference documents/resources

Further information about TTC/ATC and the criteria governing ATC/TTC within NEPOOL is available from the following documents:

- NERC Policy 3, Interchange. Section E: Transfer Capability
- *Available Transfer Capability Definitions and Determination, NERC, June, 1996*
- *Revised NPCC Methodology and Procedure for the Determination and Posting of Available Transfer Capability, NPCC, 1998*
- *NPCC Methodology and Guidelines for Forecasting TTC and ATC. NPCC, April, 2001*
- *Central Maine Power Company Open Access Transmission Tariff, Attachment C.*
- *NEPOOL Operating Procedure 19 (OP19) Transmission Operations*