NorthWestern Corporation,Montana OATT
Filing Category: New Filing Date: 10/02/2018
FERC Docket: ER19-00029-000 FERC Action: Accept
FERC Order: Delegated Letter Order Order Date: 11/29/2018
Effective Date: 10/08/2018 Status: Effective
Attachment C, Att C - Methodology To Assess Available Transfer Capability (1.0.0)

ATTACHMENT C

Methodology to Assess Available Transfer Capability

This Attachment C contains the Transmission Provider's methodology for determining Available Transfer Capability (ATC).

The Transmission Provider employs the rated system path (contract path) methodology in its determination of ATC.

(1) **Description of Mathematical Algorithm Used to Calculate Firm and Non-Firm ATC**

To determine firm and non-firm ATC, the Transmission Provider uses the following algorithms for the scheduling, operating, and planning horizons, as provided in MOD-029:

Firm: $ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + counterflows_F$

Where:

- **ATC_F** is the firm Available Transfer Capability for the ATC Path for that period.
- **TTC** is the Total Transfer Capability of the ATC Path for that period.
- **ETC_F** is the sum of existing firm commitments for the ATC Path during that period.
- **CBM** is the Capacity Benefit Margin for the ATC Path during that period.
- **TRM** is the Transmission Reliability Margin for the ATC Path during that period.
- **$Postbacks_F$** are changes to firm ATC due to a change in the use of Transmission Service for that period, as specified in the Postback Methodology document.
- **$counterflows_F$** are adjustments to firm ATC as specified in the Available Transfer Capability Implementation Document (ATCID).

Non-Firm: $ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_S - TRM_U + Postbacks_{NF} + counterflows_{NF}$

Where:

- **ATC_{NF}** is the non-firm Available Transfer Capability for the ATC Path for that period.
- **TTC** is the Total Transfer Capability of the ATC Path for that period.
- **ETC_{NF}** is the sum of *Existing* non-firm *Transmission Commitments* for the ATC Path during that period
- **CBM_S** is the Capacity Benefit Margin for the ATC Path that has been scheduled during that period
- **TRM_U** is the Transmission Reliability Margin for the ATC Path that has not been released for sale (unreleased) as non-firm capacity by the Transmission Service Provider during that period.
- **$Postbacks_{NF}$** are changes to non-firm ATC due to a change in the use of Transmission Service for that period, as specified in the Postback Methodology document.
- **$counterflows_{NF}$** are adjustments to non-firm ATC as specified in the ATCID document.

Definitions

The Scheduling Horizon is defined as the real-time (same day or next-hour) period.

The Operating Horizon is defined as the day-ahead or preschedule period.

The Planning Horizon is defined as the period beyond the Operating Horizon.

(2) **Process Flow Diagram Illustrating Various Steps Through Which ATC is Calculated**

See Appendix 1.

(3) **Detailed Description of How Each ATC Component is Calculated for the Operating and Planning Horizons**

(a) **Total Transfer Capability (TTC)**

(i) **Definition**

Total Transfer Capability (TTC) means the amount of electric power that can be moved or transferred reliably from one area to another area of the interconnected transmission systems by way of all transmission lines (or paths) between those areas under specified system conditions, or such definition as contained in Commission-approved Reliability Standards.

As described below, the TTC is also dependent on transmission rights the Transmission Provider may have on a transmission path.

(ii) **Calculation Methodology**

1. When performing the technical studies to determine the TTC for those Posted Paths, the Transmission Provider will follow the effective MOD-029 – Rated System Path Methodology.

2. For those Posted Paths that are also defined in the WECC Path Rating Catalog, the method for determining TTC was/is defined in accordance with the Western Electricity Coordinating Council (WECC) Project Coordination, Path Rating and Progress Report Processes. The reliable seasonal System Operating Limits (SOL) are established through the seasonal study process as required by the Northwest Power Pool (NWPP) Northwest Operations Study Group (NOPSG) and study processes.

3. TTC is determined either prior to a new transmission component being brought into service or when a modification to a transmission component would affect the TTC.

4. Once the TTC determination is made, it remains fixed until a new study is performed that defines a different TTC or there is a change to the transmission system that requires a change to the TTC such as a topology change, an outage, or a curtailment on the transmission system.

5. When transmission facilities are jointly owned, the capacity is allocated between the owners based on the joint ownership share or as defined in the participation agreement; therefore, the TTC of the jointly owned facilities will be based upon the capacity allocated to the Transmission Providers.

6. A Posted Path may be separated into its ownership shares and/or scheduling rights to properly allow for the commercial use of the path. , The s' TTCs will be based on the same studies used to determine the path TTC, including the thermal rating of the components.

7. Narratives explaining changes to monthly and/or yearly TTC are posted on OASIS.

(iii) **Databases Used in TTC and Seasonal SOL Assessments**

The transmission system base cases used by the Transmission Provider in its TTC and seasonal SOL assessments are developed by the WECC and adjusted, if necessary, to meet the MOD-029 and NWPP NOPSG study requirements.

(iv) **Assumptions Used in TTC and Seasonal SOL Assessments**

To determine the maximum flow or reliability limit, the following variables are varied collectively as appropriate to yield flows that stress the transmission system. The variables include, but are not limited to:

1. the network load level,
2. resource/generation dispatch,
3. transmission topology, and
4. import/export flows on paths to neighboring transmission systems.

The Network load must be varied from light to heavy load conditions in order to determine the most stressful conditions on the transmission system. Light network loads can produce high flow on export paths and heavy network loads can produce high flows on transmission serving local loads. Generation within the network could be varied from 0 MW to maximum generation levels. Generation level directly affects export path flows because there is more generation in the Balancing Area than there is load. Import/export conditions are varied on paths to neighboring transmission systems to cause maximum stress on the transmission path that is being studied. An example of how these variables might be combined and studied is:

i) light local network load,
ii) maximum generation in eastern Montana,
iii) maximum imports from eastern Montana paths
iv) and export conditions on the paths in western Montana.

The performance criteria that are considered in these studies are defined by the appropriate NERC and WECC Standards or NWE local lower voltage transmission requirements posted at www.nerc.com, www.wecc.biz.

The outage conditions studied include all single and credible multiple line outages that could affect transmission system steady state, transient and post transient performance. For paths that include the 500 kV lines that traverse Montana, all 500 kV single and credible double line outages are studied. For lower voltage paths, all single and credible multiple outages that affect the path transmission system steady state and transient performance are studied.

(b) **Existing Transmission Commitments (ETC)**

(i) **Definition**

ETC is any transmission that is already committed for use and is calculated as follows:

Firm: $ETC_F=NL_F + NITS_F + GF_F + PTP_F + ROR_F + OS_F$

Where:

- NL_F is the firm capacity set aside to serve peak Native Load forecast commitments for the time period being calculated, to include losses, and Native Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

- $NITS_F$ is the firm capacity reserved for Network Integration Transmission Service serving Load, to include losses, and Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

- GF_F is the firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff."

- PTP_F is the firm capacity reserved for confirmed Point-to-Point Transmission Service.

- ROR_F is the firm capacity reserved for Roll-Over Rights for contracts granting Transmission Customers the right of first refusal to take or continue to take Transmission Service when the Transmission Customer's Transmission Service contract expires or is eligible for renewal.

- OS_F is the firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using Firm Transmission Service as specified in the Available Transfer Capability Implementation Document (ATCID).

Non-Firm: $ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}$

Where:

- $NITS_{NF}$ is the non-firm capacity reserved for Network Integration Transmission Service serving Load (i.e., secondary service), to include losses, and load growth not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

- GF_{NF} is the non-firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where

executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff."

- PTP_{NF} is non-firm capacity reserved for confirmed Point-to-Point Transmission Service.

- OS_{NF} is the non-firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using non-firm transmission service as specified in the ATCID.

(ii) **Calculation Methodology to Determine Transmission Capacity Set Aside for Native Load, Network Load, and Non-OATT customers**:

Native load and network service type contracts are modeled using the megawatt quantity and other terms which are determined consistent with the OATT and the transmission customer's loads and resources forecasts.

The Transmission Provider does not have any non-OATT customers, therefore a calculation methodology used to determine the transmission capacity to be set aside for non-OATT customers is neither necessary nor included in this Attachment C.

(iii) **Incorporation of Point-To-Point Transmission Service Requests**

For existing, confirmed TSRs and to properly account for potential rollover requests, point-to-point type contracts are modeled using the specified megawatt quantity, point of receipt, and point of delivery.

(iv) **Accounting for Rollover Rights**

In its determination of ATC, the Transmission Provider must assume that a Transmission Customer having the ability to do so, will rollover its existing long term TSR. To account for this, transmission in the amount of the confirmed TSR is set aside, thereby reducing the ATC by the same amount.

(v) **Process for Ensuring that Non-Firm Capacity is Released Properly**

Transmission reservations that are not scheduled will be made available and posted on OASIS as non-firm ATC.

(c) **Available Flowgate Capacity (AFC) Methodology**

The Transmission Provider does not use an AFC methodology to calculate ATC.

(d) **Transmission Reliability Margin (TRM)**

(i) **Definition**

TRM is the amount of transmission transfer capability necessary to provide a reasonable level of assurance that the interconnected transmission network will be secure under a broad range of uncertainties in system conditions. TRM accounts for the inherent uncertainty in system conditions and system modeling, and the need for operating flexibility to ensure reliable system operation as system conditions change.

(ii) **Calculation Methodology**

The Transmission Provider does not use a calculation methodology in its determination of TRM.

(iii) **Databases Used in TRM Assessments**

The Transmission Provider does not use any databases in its TRM assessments.

(iv) **Conditions Under Which the Transmission Provider Uses TRM**

The Transmission Provider may utilize TRM for any of the components of uncertainty listed in the current NERC Reliability Standard MOD-008 – TRM Calculation Methodology. A description of how each component may be used is posted in the TRM Implementation Document (TRMID) on OASIS.

(e) **Capacity Benefit Margin (CBM) Practice**

Capacity Benefit Margin (CBM) is defined as the amount of firm transmission transfer capability preserved by the Transmission Provider for Load-Serving Entities (LSEs), whose loads are located on the Transmission Provider's Transmission System, to enable access by the LSEs to generation from interconnected systems to meet generation reliability requirements. Preservation of CBM for an LSE allows an entity to reduce its installed generating capacity below that which may otherwise have been necessary without interconnections to meet its generation reliability requirements. The transmission transfer capability preserved as CBM is intended to be used by the LSE only in times of emergency generation deficiencies.

During periods where Transmission Provider maintains CBM, Transmission Provider will annually reevaluate its need to maintain CBM as required in MOD-004.

(f) **Capacity Benefit Margin (CBM)**

(i) **Definition**

CBM is the amount of firm transmission transfer capability reserved by Load Serving Entities (LSEs) on the host transmission system where their load and generation resources are located, to enable access to generation from interconnected systems to meet generation reliability requirements. CBM is a uni-directional quantity with identifiable beneficiaries, and its use is intended only for the time of emergency generation deficiencies.

(ii) **Databases Used in CBM Assessments**

The Transmission Provider does not use any databases in its CBM assessments.

(iii) **No Double-Counting of Contingency Outages When Performing CBM, TTC, and TRM Calculations**

Since TTC is based upon path rating studies that incorporate contingency outages, and the Transmission Providers determination and utilization of CBM and TRM are independent of contingency outages, there can be no double-counting of contingency outages.

(g) **Procedures for Allowing the Use of CBM**

A Load Serving Entity (LSE) in NorthWestern Energy's Control Area may request CBM be set aside; these requests must be made on the OASIS via a Transmission Service Request.

(h) **Postbacks**

Firm Postbacks ($Postbacks_F$) will include the capacity values of Recalls, Redirects and Annulled Firm Reservations.

Non-Firm Postbacks ($Postbacks_{NF}$) will include all Firm Postbacks plus the unscheduled firm capacity of confirmed Transmission Service.

(i) **Counterflows**

The scheduled energy values of transactions utilizing either a Firm or Non-firm Transmission Service on the opposite path for which an ATC is being calculated, i.e. for the purposes of ATC counterflows are counter schedules. Firm counter schedules will add capacity to the calculation of Non-Firm ATC in the Scheduling Horizon.