1.0 General:

UGPR is a NERC registered Transmission Service Provider, Transmission Operator, and Balancing Authority (Balancing Authority Area “WAUE” in the Midwest Reliability Organization (MRO) region and “WAUW” in the Western Electricity Coordinating Council (WECC) region), and also a member of the Mid-Continent Area Power Pool (MAPP) and observes the MAPP Policies and Procedures, and WECC procedures, as applicable. UGPR’s OASIS site is located at: http://www.oasis.oati.com/wapa/index.html.

UGPR utilizes the MAPP MTA, which is an OATI WebTrans system specifically modified to accommodate MAPP’s requirements for processing of MAPP Member’s transmission service request evaluations, and for performing AFC and ATC calculations on the MAPP Member’s transmission system for posting on the MAPP Member’s OASIS.

UGPR as the Transmission Service Provider uses the following basic algorithms for the calculation of ATC/AFC values, as applicable:

2.0 UGPR Flowgate AFC/ATC/Effective ATC Algorithms:

Firm AFC Calculation

When calculating Firm AFC for a Flowgate for a specified period, UGPR uses the following algorithm:

$$AFC_F = TFC - ETC_F - CBM_i - TRM_i + Postbacks_{Fi} + Counterflows_{Fi}$$

Where,

- $AFC_F$ is the firm Available Flowgate Capability for the Flowgate for that period.
- $TFC$ is the Total Flowgate Capability of the Flowgate for that period and is equivalent to Total Transfer Capability (TTC).
ETCFi is the sum of the impacts of existing firm Transmission commitments on the Flowgate during that period.

CBMi is the impact of the Capacity Benefit Margin on the Flowgate during that period.

TRMi is the impact of the Transmission Reliability Margin on the Flowgate during that period.

PostbacksFi are changes to firm AFC due to a change in the use of firm Transmission Service for that period.

CounterflowsFi are adjustments to firm AFC as determined by the Transmission Service Provider and specified in their ATCID.

Non-Firm AFC Calculation

When calculating non-firm AFC for a Flowgate for a specified period, UGPR uses the following algorithm:

\[ AFC_{NF} = TFC - ETC_{Fi} - ETC_{NFi} - CBM_{Si} - TRM_{Ui} + Postbacks_{SNFi} + Counterflows_{SNFi} \]

Where:

AFC_{NF} is the non-firm Available Flowgate Capability for the Flowgate for that period.

TFC is the Total Flowgate Capability of the Flowgate for that period and is equivalent to Total Transfer Capability (TTC).

ETCFi is the sum of the impacts of existing firm Transmission commitments for the flowgate during that period.

ETC_{NFi} is the sum of the impacts of existing non-firm Transmission commitments for the flowgate during that period.

CBM_{Si} is the impact on the Flowgate of any schedules using Capacity Benefit Margin during that period.
TRMUi is the impact on the Flowgate of the Transmission Reliability Margin that has not been released (unreleased) for sale as non-firm capacity by the Transmission Service Provider during that period.

PostbacksNFi are changes to non-firm AFC due to a change in the use of non-firm Transmission Service for that period.

CounterflowsNFi are adjustments to non-firm AFC as determined by the Transmission Service Provider and specified in their ATCID.

**AFC to ATC Conversion**

When converting Flowgate AFCs to ATCs for ATC Paths, UGPR uses the following algorithm:

\[
\text{ATC} = \min(P)
\]

\[
P = \{\text{PATC}_1, \text{PATC}_2, \ldots, \text{PATC}_n\}
\]

\[
\text{PATC}_n = \frac{\text{AFC}_n}{\text{DF}_{np}}
\]

Where,

ATC is the Available Transfer Capability.

P is the set of partial Available Transfer Capabilities for all “impacted” flowgates honored by the Transmission Service Provider; a flowgate is considered “impacted” by a path if the Distribution Factor for that path is greater than 3% on an OTDF Flowgate or 5% on a PTDF Flowgate.

PATCn is the partial Available Transfer Capability for a path relative to a Flowgate n.

AFCn is the Available Flowgate Capability of a Flowgate n.

DFnp is the distribution factor for Flowgate n relative to path p.

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**Firm ATC Calculation (ATC Paths)**

When calculating Firm ATC for an ATC Path for a specified period, UGPR uses the following algorithm:
\[ \text{ATCF} = \text{TTC} - \text{ETCF}_i - \text{CBM}_i - \text{TRM}_i + \text{Postbacks}_{Fi} + \text{Counterflows}_{Fi} \]

Where,

\( \text{ATCF} \) is the firm Available Transfer Capability for the ATC Path for that period.

\( \text{TTC} \) is the Total Transfer Capability of the ATC Path for that period.

\( \text{ETCF}_i \) is the sum of the existing firm commitments for the ATC Path during that period.

\( \text{CBM}_i \) is the Capacity Benefit Margin for the ATC Path during that period.

\( \text{TRM}_i \) is the Transmission Reliability Margin for the ATC Path during that period.

\( \text{Postbacks}_{Fi} \) are changes to firm Available Transfer Capability due to a change in the use of firm Transmission Service for that period.

\( \text{Counterflows}_{Fi} \) are adjustments to firm Available Transfer Capability as determined by the Transmission Service Provider and specified in their ATCID.

**Non-Firm ATC Calculation (ATC Paths)**

When calculating Non-Firm ATC for an ATC Path for a specified period, UGPR uses the following algorithm:

\[ \text{ATCNF} = \text{TTC} - \text{ETCF}_i - \text{ETCNFi} - \text{CBMSi} - \text{TRM}_i + \text{Postbacks}_{Fi} + \text{Counterflows}_{Fi} \]

Where,

\( \text{ATCNF} \) is the non-firm Available Transfer Capability for the ATC Path for that period.

\( \text{TTC} \) is the Total Transfer Capability of the ATC Path for that period.

\( \text{ETCF}_i \) is the sum of the existing firm commitments for the ATC Path during that period.
ETC_{NFi} is the sum of the existing non-firm commitments for the ATC Path during that period.

CBM_{Si} is the Capacity Benefit Margin for the ATC Path that has been scheduled during that period.

TRM_{Ui} 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_{NFi} are changes to non-firm Available Transfer Capability due to a change in the use of Transmission Service for that period.

Counterflows_{NFi} are adjustments to non-firm Available Transfer Capability as determined by the Transmission Service Provider and specified in their ATCID.

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**Firm Existing Transmission Commitments (ETC) Calculation**

When calculating Firm ETC for a specified period, UGPR uses the following algorithm:

$$ETC_F = NL_F + NITS_F + GFF + PTP_F + ROR_F + OS_F$$

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.

$GFF$ 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\textsubscript{F} is the firm capacity reserved for confirmed Point-to-Point Transmission Service.

ROR\textsubscript{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\textsubscript{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 ATCID.

**Non-Firm Existing Transmission Commitments (ETC) Calculation**

When calculating Non-Firm ETC for a specified period, UGPR uses the following algorithm:

\[ \text{ETC}_{\text{NF}} = \text{NITS}_{\text{NF}} + \text{GF}_{\text{NF}} + \text{PTP}_{\text{NF}} + \text{OS}_{\text{NF}} \]

Where,

- \(\text{NITS}_{\text{NF}}\) is the non-firm capacity set aside 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.

- \(\text{GF}_{\text{NF}}\) 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.”

- \(\text{PTP}_{\text{NF}}\) is non-firm capacity reserved for confirmed Point-to-Point Transmission Service.

- \(\text{OS}_{\text{NF}}\) 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.

The specific details of the AFC/ATC calculations performed by the MAPP MTA can be found in Appendix F in the latest version of the MAPP Policies and Procedures, which can be found at the MAPP OASIS Information Page at [http://www.oasis.oati.com/mapp/index.html](http://www.oasis.oati.com/mapp/index.html). The MAPP
Policies and Procedures are listed under the “Business Practices” area.

A direct link is also provided on UGPR’s OASIS page under the ATC Information, ATC-AFC-Algorithms sub-folder for the “Current MAPP MTA AFC/ATC Calculation Methodology”, which is excerpted from the Appendix F of the MAPP Policies and Procedures document:


3.0 Questions- Contact:

If you have any questions please contact Steve Sanders at (406) 255-2840 or by email at sanders@wapa.gov, or Kass Portra at (406) 255-2842 or by email at portra@wapa.gov.