OUC ATTACHMENT C:
Methodology to Assess Available Transfer Capability

This Attachment C describes the methodology that Orlando Utilities Commission ("OUC") uses to assess Total Transfer Capability ("TTC") and Available Transfer Capability ("ATC"). OUC, along with other Florida Reliability Coordinating Council ("FRCC") members, uses an ATC/TTC calculation software program ("Engine") that is provided and hosted by Open Access Technology International, Inc. ("OATi"). Members of the FRCC, including OUC, have formed the Florida Transmission Capability Determination Group ("FTCDG") in an effort to provide ATC values to the regional electric market that are transparent, coordinated, timely, and accurate. The FTCDG has contracted OATi to provide and host the calculation Engine that will produce ATC and TTC values for the region. The methodology and criteria conform to the applicable North American Electric Reliability Corporation ("NERC") Reliability Standards, as approved by the Federal Energy Regulatory Commission ("FERC"). OUC posts its ATC mathematical algorithms on its OASIS at https://www.oatioasis.com/OUCT/OUCTdocs/Mathematical_Algorithm_Used_to_Calculate_Firm_and_Non-Firm_ATC.pdf.

Specific Mathematical Algorithm
The following algorithms are used for ATC.

	ATC CALCULATION HORIZON		
	SCHEDULING (Same day and real-time)	**ATC OPERATING (Day ahead and pre-schedule)**	**ATC PLANNING (Beyond ATC Operating Horizon through month 13)**
FIRM	N/A	ATC = TTC - ETC - TRM - CBM	ATC = TTC - ETC - TRM - CBM
NON-FIRM	ATC = TTC - ETC	ATC = TTC - ETC - CBM	ATC = TTC - ETC - CBM

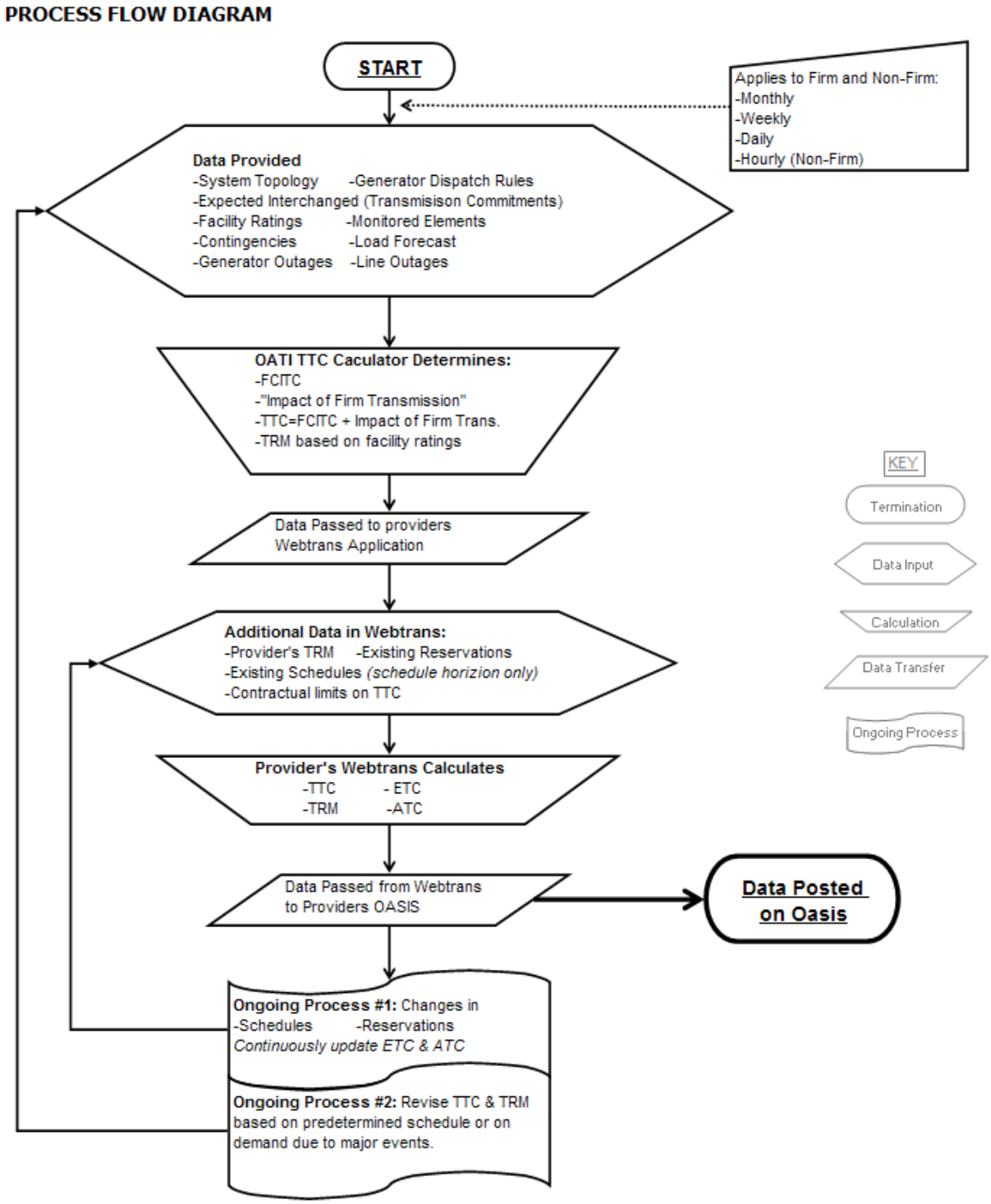
OUC does not use the flowgate methodology or AFC as described in NERC Standard MOD 030-0. OUC also does not use CBM as a component of its calculation, and while shown in the equations above it always has a value of zero.

The Scheduling Horizon is the same day and real time.
The ATC Operating Horizon is day ahead and pre-schedule.
The ATC Planning Horizon is beyond the operating horizon out to month 13.
Hourly TTC's for the next 72 Hours and are calculated every hour
Hourly TTC's for the next 168 hours are calculated once every day
Daily TTC's are calculated for the next 31 days once every day
Monthly TTC's are based on a calculation of TTC's for the next 395 Days, performed once every week.

TTC values may be recalculated more frequently if conditions warrant it. ATC values for Hourly, Daily and Monthly are recalculated every time one of the components in the calculation changes (TTC, ETC, TRM, CBM).

Daily ATC's for the period that overlap the hourly calculation are based on the most restrictive of the hourly values for that day. Monthly calculations are derived from a calculation of ATC for the next 395 Days and the selection of the most restrictive ATC within the month.

Process Flow Diagram



Detailed explanation: TTC

Definition of TTC from the NERC Glossary of Terms: 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.

TTC Calculation Methodology:
The Engine calculates the First Contingency Incremental Transfer Capability ("FCITC") between two areas that define a transmission path; the “From” area and the “To” area. The generation is increased in the From area and decreased in the To area while monitoring for contingency overload conditions. If the From area’s generation is fully dispatched and an overload condition has not been reached, a limited amount of artificial generation is added to that area and dispatched until a limiting contingency condition occurs. Conversely if the receiving area has no more generation to reduce, a limited amount of artificial load is added to the area.

The Engine also calculates the maximum transfer without a contingency for each path. The lower of this value and the first-contingency transfer amount is carried forward as the FCITC.

The value of TTC is the lower of the contractual limitations for a path and the FCITC added to the “impacts of firm transmission services.” The value for this “impact of firm transmission service” is based on the firm transmission services modeled in the study case.

Database used in TTC Calculation:

The Engine builds the model for calculating the FCITC using the following databases:

- Topological Transmission model of FRCC and parts of the Eastern Interconnection
- Generator Dispatch Rules
- Expected Interchange (Transmission Services to be modeled)
- Monitored Elements and their Facility Ratings
- Contingencies
- Load Forecast (From Regional Load Forecast)
- Planned and actual Generator and Line Outages (From Regional FTMS system)

The resulting TTC values are compared against a list of the contractual limitations for the various paths.

Assumptions used in TTC Calculation:

Load Levels are based on the load forecast for each area of the FRCC, including OUC. If a situation occurs where data for an area is not available for a particular time frame OATi will either scale the load level (relative to peak) for that time based on the Florida Power and Light (FPL) load forecast, a longer term load forecast or the load level predicted by a forecasting service contracted by OATi . These are the same sources of load forecasts for operations and planning studies of the same time frame.

Generation Dispatch is based on a Block and Priority list provided by each area. This Block and Priority list is based on the same assumptions as the dispatch model used for operations and planning studies of the same time frame.

Planned Outages are incorporated based on the FRCC FTMS reported outages. The FRCC FTMS system is an on line system that all transmission operators in Florida report their planned and actual line and generator outages. This is the same data that is used for operations and planning studies of the same time frame.

Contingency Outages are established cooperatively by all participants and are generally BES facilities along with some select lower voltage facilities. The specific selection is based on contingencies that are known to cause or could cause constraints. These are the contingencies that need to be reviewed to insure that there are no SOL violations that occur due to transactions. Operations and planning studies are performed by FRCC groups and individual entities and have varying ranges of contingencies considered depending on the scope of the particular study. Taking those studies collectively, they use a similar set of contingencies.

Detailed explanation: ETC

Definition of ETC from the NERC Glossary of Terms: Committed uses of a Transmission Service Provider's Transmission system considered when determining ATC or AFC.

Calculation Methodology for native load customers: Native load customers have capacity set aside when there is external resource that is captured in the ETC calculation.

Calculation Methodology for Non-OATT customers: Non-OATT customers have capacity set aside in ETC through either; a place holder network service reservation (OASIS), a place holder PTP transmission service reservation (OASIS) or another place holder value in the calculation of ETC.

Point to Point Transmission service requests in ATC: Point to Point Transmission service requests reside within OUC's OASIS System and are included in the ETC value.

Rollover Rights in ETC: Generally a decision regarding the "rollover" of a transmission service is settled prior to the ATC planning horizon. However in cases where it is has not been settled OUC makes a determination based on discussion with the various parties to the transmission service. At a minimum, the contract must be eligible for roll over, system changes (if any) required to support that roll over must be within the model and parties involved must have indicated that a roll over is going to be pursued. In those cases the roll over service is included as a place holder transmission service in OASIS or another variable in the calculation system for ETC.

Release of non-firm capacity if not scheduled: Capacity that is scheduled through “Etags” is released in the scheduling horizon based on the difference between the Etag and the reservation. Reservations that do not use the Etag system may be released based on their forecasted use in that time frame. This forecasted use is based on the load forecast and corresponding expected usage of that reservation.

Flowgates: OUC does not use the flowgate methodology (MOD 030) therefore there is no criteria or methodology for adding or eliminating flowgates (permanent or temporary).

Detailed explanation: AFC
OUC does not use the flowgate methodology or AFC as defined in the NERC standard MOD 030-0 to calculate ATC.

Detailed explanation: TRM
Definition of TRM from the NERC Glossary of Terms: The amount of transmission transfer capability necessary to provide reasonable assurance that the interconnected transmission network will be secure. TRM accounts for the inherent uncertainty in system conditions and the need for operating flexibility to ensure reliable system operation as system conditions change.

TRM Calculation methodology:

There are two components to the TRM values used in the determination of ATC. The first is a value derived by the Engine each time it runs that represents the difference between the higher facility ratings some entities use for Non Firm transactions, and the lower rating they use for Firm Transactions. The difference between the FCITC calculated using the higher (non-firm) facility ratings compared to the FCITC calculated using the lower (firm) facility ratings is the Engine TRM. When the limiting constraint is a facility where the owner has not designated different firm and nonfirm facility rating, the Engine TRM component is zero.

The second value is the OUC-Specific TRM. OUC reviews this value annually, or more often, and it can be based on one of three different factors. The first is consideration of the effect on transfer capability of a single key generating unit outages in combination with line outages over summer peak or winter peak conditions. The second factor is OUC’s FRCC operating reserves obligations (“ORes") relative to interface being considered. The third factor could be a coordinated value that matches the other interface owners TRM value. These values are considered individually and either one value or a value representing median or average of the sources is selected. The three values are not added together to reach the TRM.

The Engine TRM is added to OUC’s specific TRM to reach the total TRM value.

Databases used in OUC’s TRM assessments: The TRM is based on the databases listed under the calculation of TTC as well as the current ORes obligations and any material provided by the other interface owner.

OUC’s Use of TRM: TRM is used for determining the Firm ATC, it is not used for the Non-Firm ATC.

Detailed explanation: CBM

OUC does not use CBM on its interfaces.

Definition of CBM provided from the NERC Glossary of Terms: The amount of firm transmission transfer capability preserved by the transmission provider for Load-Serving Entities (LSEs), whose loads are located on that Transmission Service Provider's system, to enable access by the LSEs to generation from interconnected systems to meet generation reliability requirements. Preservation of CBM for an LSE allows that 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.: The amount of transmission transfer capability necessary to provide reasonable assurance that the interconnected transmission network will be secure. TRM accounts for the inherent uncertainty in system conditions and the need for operating flexibility to ensure reliable system operation as system conditions change.