Effective Date	Description of Change
4/1/2011	Initial Version (Version 1)
12/19/2013	Version 1.1 - Revisions made to clarify language and reflect changes reported by the Transmission Operator (Southern Company Services, Inc. - Trans) in its TTC calculations

Available Transfer Capability Implementation Document
For MEAG Power

PURPOSE:

To ensure that: (i) calculations are performed by MEAG Power ("MEAG") to maintain awareness of available transmission system capability and future flows on MEAG's system as well as MEAG's neighbors and (ii) to increase consistency and reliability in the development and documentation of Transfer Capability calculations for short-term use to support analysis and system operations.

1. Southern Company Services, Inc. **–** Transmission ("SCS"), the Transmission Operator for MEAG's facilities, has adopted the Area Interchange Methodology for calculating Available Transfer Capability ("ATC") for each ATC Path (Attachment A) per time period identified for facilities within its transmission operating area.

2. MEAG prepares and keeps current this Available Transfer Capability Implementation Document ("ATCID") that includes, at a minimum, the following information in Attachments B, C, D, E and F:

2.1. Information describing how the Area Interchange Methodology has been implemented in such detail that, given the same information used by MEAG (e.g.: Transfer Capability, existing transmission commitments, reliability margins, postbacks, counterflows, etc.), the results of the ATC calculations can be validated (Attachment B).

2.2. A description (Attachment B) of the manner in which MEAG accounts for counterflows including:

2.2.1. How confirmed transmission reservations, expected Interchange and internal counterflows are addressed in firm and non-firm ATC calculations. Confirmed Transmission reservations and expected Interchange are addressed for firm and non-firm ATC calculations in Attachment B's formula "ATC (Path, Service Type and Time Period specific) = …" Counterflows for internal ATC Paths are zero for firm and non-firm service in all time periods.

2.2.2. The rationale for the accounting of counterflows specified in 2.2.1. The rationale for accounting of counterflows in Attachment B's formula "ATC (Path, Service Type and Time Period specific) = …" explicitly accounts for calculating the effect of confirmed Transmission reservations and expected Interchange. Counterflows for internal ATC Paths are set to zero because power flow associated with internal paths may not provide relief to constrained facilities that would enable a reliable increase in ATC values.

2.3. The identity of Transmission Operators ("TOP") and Transmission Service Providers ("TSP") from which MEAG receives data for use in calculating ATC (Attachment D lists the Transmission Operators and Transmission Service Providers from which MEAG, as Transmission Service Provider, receives data for use in calculating ATC. Attachment C lists the identity of Transmission Operators and Transmission Service Providers from which SCS, as the Transmission Operator, receives data for use in calculating TTC).

2.4. The identity of the Transmission Service Providers and Transmission Operators to which it provides data for use in calculating Transfer Capability (Attachment E).

2.5. A description of the allocation processes listed below that are applicable to MEAG:

- Processes used to allocate Transfer Capability among multiple lines or sub-paths within a larger ATC Path. (Not Applicable)
- Processes used to allocate transfer capabilities among multiple owners or users of an ATC Path. (Attachment F)

- Processes used to allocate transfer capabilities between Transmission Service Providers to address issues such as forward looking congestion management and seams coordination. (Not Applicable)

2.6. A description (Attachment B) of how generation and transmission outages are considered in Transfer Capability calculations, including:

2.6.1. The criteria used to determine when an outage that is in effect part of a day impacts a daily calculation.

2.6.2. The criteria used to determine when an outage that is in effect part of a month impacts a monthly calculation.

2.6.3. How outages from other Transmission Service Providers that cannot be mapped to the transmission model used to calculate Transfer Capability are addressed.

3. MEAG includes in this ATCID, at a minimum, the following information relative to its methodology for determining Total Transfer Capability ("TTC"):

3.1. Information describing how the selected methodology has been implemented, in such detail that, given the same information used by MEAG [1], the results of the TTC calculations can be validated (Attachment B and Attachment F).

3.2. A description of the manner in which MEAG will account for Interchange Schedules in the calculation of TTC [1] (Attachment B).

3.3. Any contractual obligations for allocation of TTC (Attachment B).

3.4. A description of the manner in which contingencies are identified for use in the TTC process (Attachment B).

3.5. The following information on how source and sink for transmission service is accounted for in ATC calculations:

3.5.1. Define if the source used for ATC calculations is obtained from the source field or the Point of Receipt ("POR") field of the transmission reservation (Attachment B)

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[1] TTC values are supplied to MEAG by SCS pursuant to an agreement between MEAG and Georgia Power Company.

3.5.2. Define if the sink used for ATC calculations is obtained from the sink field or the Point of Delivery ("POD") field of the transmission reservation (Attachment B)

3.5.3. The source/sink or POR/POD identification and mapping to the model (Attachment A).

4. MEAG will post new or revised ATCIDs on its OASIS.

Attachment A: List of ATC Paths [2]

1. AEC-MEAG
2. DUK-MEAG
3. FPC-MEAG
4. FPL-MEAG
5. GTC-MEAG [3]
6. JEA-MEAG
7. MEAG-AEC
8. MEAG-DUK
9. MEAG-FPC
10. MEAG-FPL
11. MEAG-GTC [3]
12. MEAG-JEA
13. MEAG-MEAG [4]
14. MEAG-SC
15. MEAG-SCEG
16. MEAG-SOCO [3]
17. MEAG-TAL
18. MEAG-TVA
19. SC-MEAG
20. SCEG-MEAG
21. SOCO-MEAG [3]
22. TAL-MEAG
23. TVA-MEAG

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[2] Southeastern Power Administration ("SEPA") is responsible for marketing electric power generated by hydroelectric facilities owned by the United States Army Corps of Engineers. These plants are located in generation only control areas, and thus MW produced by SEPA facilities are transmitted from one Balancing Authority Area to another. For TTC purposes, any transaction that has a POR or POD of a SEPA plant interconnected to the Southern Balancing Authority Area is actually either a SOCO, DUKE (Source = Hartwell) or SC (Source = Russell or Thurmond) POR or POD. Thus, for the purpose of defining ATC Paths, SEPA plant designations have a POR or POD that is "SOCO", "DUKE", or "SC". Neither SEPA nor the Corps of Engineers is registered with NERC as a Transmission Service Provider. SEPA and the Corps of Engineers are not required to develop an ATCID or calculate ATC values. Therefore, MEAG does not list MEAG-SEPA or SEPA-MEAG as ATC Paths.

[3] These ATC Paths listed on MEAG's OASIS do not represent Balancing Authority Area to Balancing Authority Area ATC Paths. These ATC Paths exist primarily to facilitate the scheduling of energy between MEAG, GTC and SOCO. MEAG, GTC and SOCO jointly own the transmission network within Georgia. Since their loads are comingled and all within the Southern Balancing Authority Area, using calculations described in Attachment B for TTC and ATC for these ATC Paths are not appropriate or practicable. Instead, MEAG, GTC and SCS set the TTC values for these ATC Paths equal to the peak load of the smaller entity in the ATC Path.

[4] The MEAG-MEAG ATC Path listed on MEAG's OASIS does not represent a traditional Balancing Authority Area to Balancing Authority Area interconnection. This "pseudo-path" exists primarily to facilitate the designation of network resources by MEAG on behalf of its Native Load Customers, and the reservation of capacity for future load growth. Since this pseudo-path represents a large number of source points to a large number of sink points, all within the Southern Balancing Authority Area, calculating TTC and resultant ATC for this pseudo-path is not appropriate or practicable. Thus, the TTC value for MEAG-MEAG is set to MEAG's annual peak load.

Attachment B:

Area Interchange Methodology Used to Calculate MEAG ATC and TTC

1. Available Transfer Capability Calculations

MEAG calculates Available Transfer Capability ("ATC") using mathematical formulas that are consistent with the current version of NERC standard MOD-028 – Area Interchange Methodology. When calculating firm ATC for an ATC Path, MEAG uses the following formula:

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

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 transmission 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 defined herein.

$counterflows_F$ are adjustments to firm ATC as determined by MEAG and specified in Attachment B of MEAG's ATCID.

When calculating non-firm ATC for an ATC Path, MEAG uses the following formula:

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

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_F is the sum of existing firm transmission commitments for the ATC Path during 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 without a separate reservation 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 MEAG 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 defined herein.

$counterflows_{NF}$ are adjustments to non-firm ATC as determined by MEAG and specified in Attachment B of MEAG's ATCID.

When calculating Existing Transmission Commitments for firm commitments ("ETC_F") for all time periods for an ATC Path, MEAG uses the following algorithm:

$$\mathbf{ETC_F = NITS_F + GF_F + PTP_F + ROR_F + OS_F}$$

Where:

$NITS_{F}$ is the firm capacity set aside for Network Integration Transmission Service (including the capacity used to serve bundled load within MEAG's area with external sources) on ATC Paths that serve as interfaces with other Balancing Authorities.

GF_{F} is the firm capacity set aside for Grandfathered Firm Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of MEAG's Transmission Service Tariff on ATC Paths that serve as interfaces with other Balancing Authorities.

PTP_{F} is the firm capacity reserved for confirmed Point-to-Point Transmission Service.

ROR_{F} is the capacity reserved for roll-over rights for Firm Transmission Service 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, including any other firm adjustments to reflect impacts from other ATC Paths as specified in MEAG's ATCID.

When calculating ETC for non-firm commitments ("ETC_{NF}") for all time periods for an ATC Path, MEAG uses the following algorithm:

$$ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}$$

Where:

$NITS_{NF}$ is the non-firm capacity set aside for Network Integration Transmission Service (i.e., secondary service, including the capacity used to serve bundled load within MEAG's area with external sources) reserved on ATC Paths that serve as interfaces with other Balancing Authorities.

GF_{NF} is the non-firm capacity reserved for Grandfathered Non-Firm Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of MEAG's Transmission Service Tariff on ATC Paths that serve as interfaces with other Balancing Authorities.

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, including any other firm adjustments to reflect impacts from other ATC Paths.

ATC is automatically updated by MEAG and posted on MEAG's OASIS each time: (i) TTC values are updated or (ii) transmission service is purchased, scheduled, or redirected. ATC values are calculated for each ATC Path, transmission service type and time period using the Area Interchange Methodology for hourly values for at least the next 48 hours, daily values for at least the next 31 calendar days, and monthly values for at least the next 12 months (months 2 – 13). MEAG calculates ATC using the same mathematical algorithm for the scheduling horizon (same day and real-time), operating horizon (day ahead and pre-schedule) and Operations Planning horizon (beyond the operating horizon up to 13 months). This algorithm is shown on the next page.

ATC (Path, Service Type and Time Period specific) =

TTC (Total Transfer Capability)

- Σ ETC (Existing Transmission Commitments at equal or higher priority service using the path) [5]

- CBM (Capacity Benefit Margin)

- TRM (Transmission Reliability Margin)

+ Σ Postbacks (Unscheduled transmission service commitments and Redirected capacity at equal or higher service code linked back to the path) [6]

+ Σ counterflows [7]

[5] Transmission service types are assigned service codes for purposes of the ATC algorithm, and such service codes are set forth in Table A. Confirmed reservations utilizing the same ATC Path and of equal or higher priority service code are considered in each calculation. For example, ATC values are calculated for Weekly Firm Point-To-Point ("PTP") transmission service for the ATC Path from a particular POR to SOCO by including confirmed reservations of service code 8 and above that utilize that ATC Path. Reservations utilizing a different ATC Path or of lower service code (e.g., service code 9) would not be included in the calculation.

[6] Postbacks are positive adjustments to ATC as determined by MEAG's business practices. MEAG's business practices may include unscheduled service and redirected services. Unscheduled transmission service commitments are considered in calculating ATC for hourly service. Confirmation of a request to redirect service results in the reduction of ATC on the redirected ATC Path and increase of ATC on the original ATC Path, at a service type with an equal or lower priority service code than the new redirected service. For example, if the original service was Weekly Firm PTP (service code 8) and the redirected service path is Daily Firm PTP (service code 10), then ATC will be added back to the original ATC Path in the calculation of Daily Firm PTP (service code 10 and below), but not in the calculation of Weekly Firm PTP. At a minimum, redirected capacity is added back to all Hourly services on the original ATC Path.

[7] Counterflows are adjustments to ATC that determine the amount of scheduled MW associated with MEAG's customers' transactions (1) which will flow in the opposite direction on a ATC Path and (2) which MEAG determines can effectively be used to increase ATC. It should be noted that counterflows associated with certain types of constraints (e.g., simultaneous Transfer Capability limits, voltage limits and stability limits) may not provide relief to constrained facilities required to enable a reliable increase in ATC values. MEAG only considers counterflows in the calculation of hourly (non-firm) ATC for external ATC Paths and, when implemented, are included on a manual basis as shown in Figure 1 captioned "ATC Process Flow Diagram".

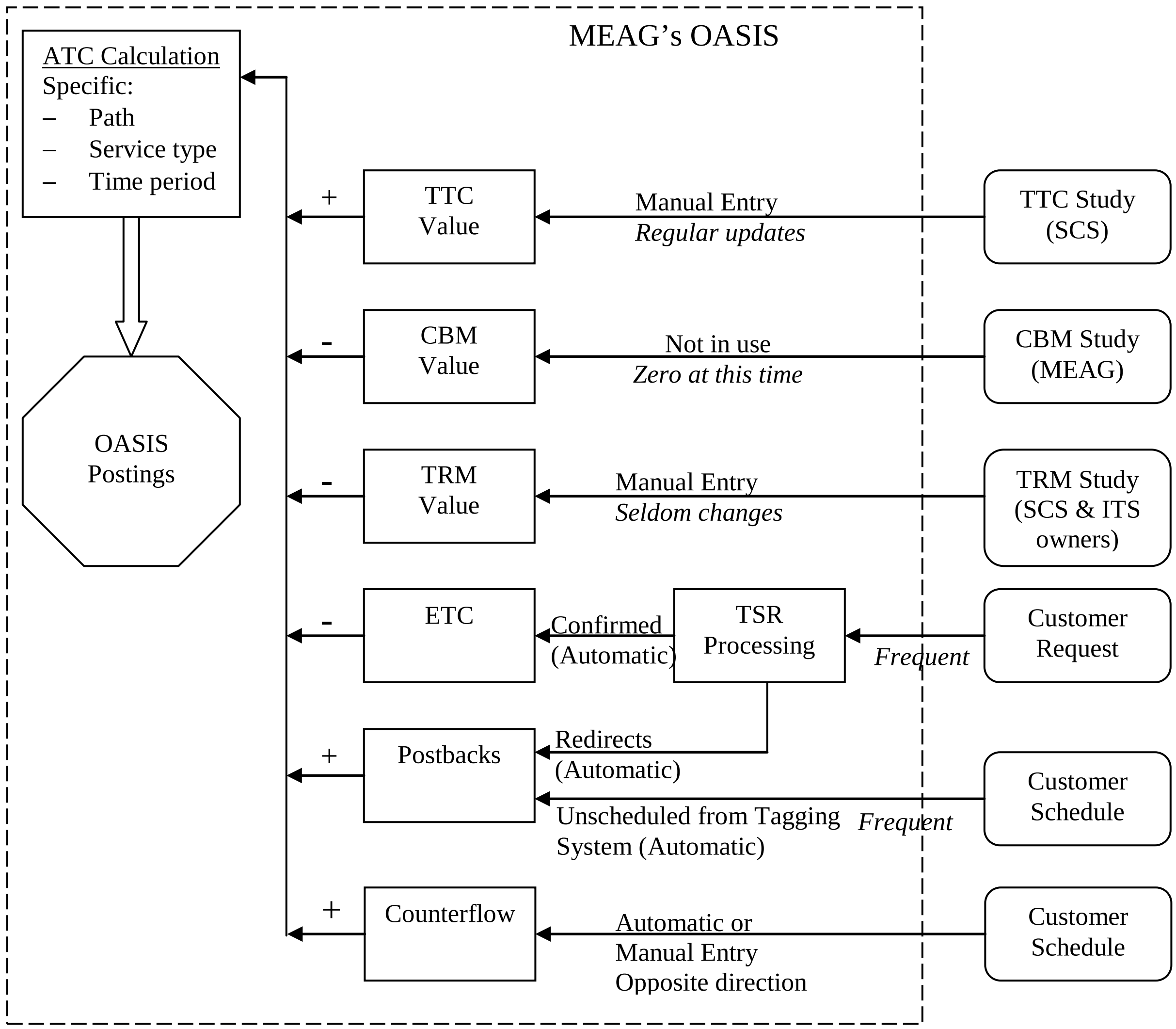
The ATC values for the different transmission service types offered on OASIS are calculated using the same formula, but certain inputs may vary. These inputs are defined for each of the service types offered and consist of a service code and three logical "flags" (i.e., whether to apply TRM, whether to apply CBM, and whether to post back unused reserved capacity). Table A below illustrates the configuration for each transmission service type offered on MEAG's OASIS.

TABLE A

ATC Algorithm Configuration

Time Period	Class	Transmission Service Type	Service Code	Apply TRM	Apply CBM	Postback Unscheduled Transmission Service
Yearly	Firm	Network	1	Y	Y	N
Yearly	Firm	Pt-to-Pt	2	Y	Y	N
Monthly	Firm	Network	5	Y	Y	N
Monthly	Firm	Pt-to-Pt	6	Y	Y	N
Weekly	Firm	Network	7	Y	Y	N
Weekly	Firm	Pt-to-Pt	8	Y	Y	N
Daily	Firm	Network	9	Y	Y	N
Daily	Firm	Pt-to-Pt	10	Y	Y	N
Daily	Secondary	Network	11	N	N	N
Hourly	Secondary	Network	12	N	N	Y
Monthly	Non-Firm	Pt-to-Pt	13	N	N	N
Weekly	Non-Firm	Pt-to-Pt	14	N	N	N
Daily	Non-Firm	Pt-to-Pt	15	N	N	N
Hourly	Non-Firm	Pt-to-Pt	16	N	N	Y
Hourly	Secondary	Pt-to-Pt	17	N	N	Y

Figure 1 ATC Process Flow Diagram



This process flow diagram illustrates the various steps through which a single ATC (based upon specific factors) is calculated. Similar ATC calculations are performed for each ATC Path, service type, and time period and will generally result in different ATC values specific to those factors.

2. **ATC Components:** The ATC components are calculated in the operations planning horizon of zero to thirteen months, consistent with the requirements of MOD-001 R2.

2.1. **Total Transfer Capability ("TTC"):** MEAG defines TTC, consistent with the NERC "Glossary of Terms Used in Reliability Standards" (as such definition was initially approved by FERC 3/16/2007) as 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." Transfer analysis conducted to determine TTC is performed by SCS consistent with the principles provided in "Transmission Transfer Capability – A Reference Document for Calculating and Reporting the Electric Power Transfer Capability of Interconnected Electric Systems – May 1995" dated May, 1995 (hereafter referred to as the "NERC TTC Reference Document"). In addition, MEAG uses a TTC calculation approach based on the Area Interchange Methodology. Transfer analysis is performed respecting all applicable System Operating Limits ("SOL").

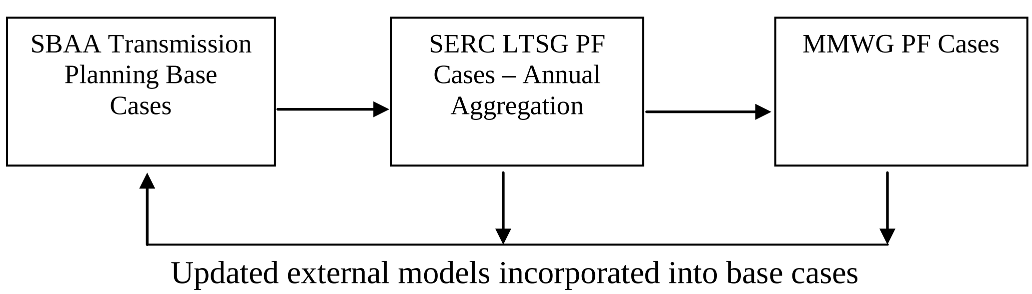
2.1.1. Process to Calculate TTC

- <u>Determining Total Transfer Capability:</u> TTC values in the Southern Balancing Authority Area ("SBAA") are evaluated on an aggregated basis, meaning that the transmission facilities of the transmission facility owners located within the SBAA are treated as a combined electrical system in transfer analysis studies. Transfer analysis is performed consistent with the principles provided in the NERC TTC Reference Document and the requirements contained the current version of MOD-028. The transfer analysis is performed for the 0-13 month horizon on a single contingency ("N-1") basis respecting all applicable System Operating Limits ("SOLs"). TTC values in the SBAA are then allocated per the allocation factors to the transmission owners in accordance with Appendix F.

- <u>Long Term Modeling and Transmission System Topology</u>: MEAG and Southern Company Services, Inc. – Trans ("SCS", which is MEAG's Balancing Authority) participate with SERC members through the SERC Intra-Regional Long Term Study Group ("LTSG") to develop yearly power flow cases. This process allows for an aggregation of reduced transmission planning models for each individual system in SERC, in which SCS elects not to reduce any transmission system elements above 100 kV. The resulting LTSG power flow cases incorporate the system topology, facility ratings, generation dispatch, system demands (load forecasts), and transmission uses provided by each SERC participant.

  The LTSG power flow cases are input into the Eastern Interconnection Reliability Assessment Group (or ERAG) Multiregional Modeling Working Group ("MMWG") model development processes, which provide the external modeling used in developing the base cases for the Southern Balancing Authority Area. The base cases for the Southern Balancing Authority Area are developed by replacing the model of the Southern Balancing Authority Area found in the LTSG power flow cases with an updated version of the Southern Balancing Authority Area power flow model. SCS then adds the specific transmission service commitments (including partial path reservations) made within the SBAA to create SBAA Transmission Planning Base Cases which are used to perform reliability planning studies and to evaluate long term transmission service requests.

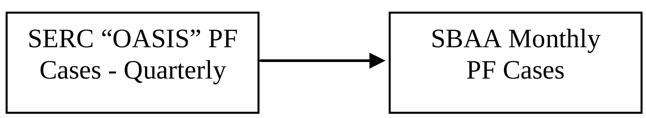
<u>Long Term Power Flow Case Development</u>



- <u>Monthly Modeling and Transmission System Topology</u>: MEAG and SCS participate with SERC members through the SERC Intra-Regional Near Term Study Group ("NTSG") to develop quarterly OASIS power flow cases for the upcoming five quarters. These cases are derived from the corresponding yearly SERC LTSG power flow cases. The SERC OASIS power flow cases incorporate the system topology, facility ratings, generation dispatch, system demands (load forecasts), and transmission uses provided by each SERC participant.

  SCS further updates the quarterly SERC OASIS power flow cases to create thirteen SBAA monthly power flow cases. These cases include system data provided by adjacent TSPs and/or TOPs identified in Attachment C, on a monthly basis, including updates to system parameters associated with each individual month. SCS also incorporates the specific transmission service commitments (including partial path reservations) made within the SBAA to create SBAA monthly power flow cases which are used for monthly TTC assessments.

<u>Monthly Power Flow Case Development</u>



- <u>Contingencies and Monitoring</u>: In Short term analysis (0-13 months), SCS tests certain SBAA contingencies including single contingencies of all transmission elements that are 100 kV and above. SCS also tests all additional facilities that are provided by adjacent entities listed in Attachment C, which passed the test described in MOD-030 R2.1.4. Potential limits to transfers within the SBAA are observed if the response factor (Power Transfer Distribution Factor "PTDF" or Outage Transfer Distribution Factor "OTDF") is 3% or greater and a viable operating procedure is not available. Potential limits to transfer with response factors below 3% may also be observed if the constraint has historically limited or is anticipated to limit transfers in real-time operations. Potential limits to transfer on any other adjacent system in the transmission model that are not on the study path are observed if the response factor is 5 % or greater and a viable operating procedure is not available.

- Reservations and Schedules: Starting with the SERC "OASIS" power flow cases, SCS incorporates confirmed reservations for the SBAA and any additional transactions provided by the entities in Attachment C, filtered to reduce or eliminate duplicate impacts from transactions using Transmission Service from multiple Transmission Service Providers.

  When developing SBAA monthly power flow cases, partial path confirmed reservations which are considered unlikely to flow in certain months based upon historical operating practice or engineering judgment may not be included in those months. To the extent schedules are known, they are included in the power flow cases.

- Points of Power Injection and Extractions (Sources and Sinks): For transfers originating in the SBAA, SCS models the source as a part of the combined system resources dispatched within the SBAA. For transfers originating outside of the SBAA, SCS reflects the transfer in the interchange with the neighboring area identified on the Point of Receipt ("POR") or the aggregate balancing area encompassing the source or POR. For transfers sinking in the SBAA, SCS models the sink specified on the transmission service request as part of the load forecast for the SBAA. For transfers sinking outside of the SBAA, SCS reflects the transfer in the interchange with the neighboring area identified on the Point of Delivery ("POD") or the aggregate balancing area encompassing the sink or POD. Source/sink information POD and POR mapping can be found in the "POR-POD_mapping.doc" document available on SCS's OASIS, (http://www.oasis.oati.com/SOCO/). For the PORs of neighboring areas, SCS uses the generation dispatch that is provided by the entities in Attachment C.

- TRM and CBM: TRM and CBM are not presently modeled in the power flow cases, nor are any facilities de-rated. TRM and CBM are accounted by MEAG in the calculation of ATC, using the equations for ATC_F and ATC_{NF} shown in Attachment B.

When appropriate to reflect system conditions, SCS may model transfers to represent CBM and/or TRM in the power flow cases. If SCS models CBM and/or TRM in the power flow cases, MEAG will remove the appropriate amount of CBM and/or TRM to ensure that there is no double counting.

- Generation Dispatch: For the areas external to the SBAA, the generation dispatch provided by the external transmission providers, listed in Attachment C, is incorporated into the power flow cases. Internal to the SBAA, SCS utilizes an expected dispatch of the network resources provided by the Load Serving Entities ("LSEs") located within the SBAA taking into account any resources that are planned to be unavailable due to generator maintenance outages. For power flow cases used to determine monthly import Transfer Capability into the SBAA for the summer months (June through September), the generation dispatch typically includes the assumption of one critical unit as offline and unavailable.

- Modeling Transfers: To model transfers to evaluate Transfer Capability, SCS utilizes a Load to Load Shift, Generation to Generation Shift or a combination of Generation/Load to Generation/Load Shift. To model transfers specific to a particular transmission service request, SCS will model the source/sink as discussed in "Points of Power Injection and Extractions (Sources and Sinks)".

- Generation and Transmission Outages: Planned generation and transmission outages for both internal and external facilities are incorporated into power flow cases. Outages of external facilities are included to the extent such are provided by the entities in Attachment C. Because outages vary over the course of a month, the outages included in the monthly power flow cases are those scheduled to occur concurrently that are anticipated to materially impact TTC values during the month. Outages from other Transmission Service Providers that cannot be mapped to the Transmission model are not included in the model.

SCS evaluates planned generation and transmission outages to determine a time frame that would result in the greatest overall impact to transfer capabilities for the month being studied. After a time frame is selected, all expected outages in this timeframe are modeled in the power flow case.

- Customer Demands, Including Interruptible Demands: The customer demand is reflected in the power flow cases which are developed as described under “Long Term Modeling and Transmission System Topology” and “Monthly Modeling and Transmission System Topology”. For monthly power flow cases, the SBAA load levels are scaled to the higher of each month’s average weekday peak from the past two years.

- Total Transfer Capability Values: TTC is the combination of:

  1) Existing commitments for transmission service reflected as base transfers, as indicated in the associated interchange spread sheet, in the power flow model and
  2) First Contingency Incremental Transfer Capability (“FCITC”) which is the amount of Transfer Capability identified in a transfer analysis, as prescribed in R6 of the current version of MOD-028, in addition to that utilized to serve the base transfers modeled in the power flow base case.

  FCITC is determined for the ATC Paths listed in Attachment A by increasing generation and/or decreasing load within the source Balancing Authority Area and decreasing generation and/or increasing load within the sink Balancing Authority Area until an applicable SOL is determined, using the source and sink generation and/or load participation factors defined in the applicable subsystem files. The FCITC value is rounded down to the nearest 10 MW.

Stated simply, TTC is determined by adding the base transfers to the FCITC.

TTC = FCITC + Base Transfers*

> *While generally true for imports in import analysis and exports in export analysis, treatment of transfers which may create opposing flows may require additional considerations. See discussion under "Reservation Netting Practices".

In an effort to provide reliable service by addressing the simultaneous interaction among multiple ATC Paths, SCS performs a simultaneous transfer analysis, in addition to the analysis prescribed in R6 of the current version of MOD-028, on a subset of the ATC Paths (e.g., SOCO-TVA, SOCO-DUK, SOCO-SCEG, SOCO-SC, TVA-SOCO, DUK-SOCO, SCEG-SOCO and SC-SOCO). This analysis reports the results on an "Area Interchange" basis as described in the NERC TTC Reference Document. TTC values are reviewed at least once per month with models and analysis updated as needed to reflect significant changes in system conditions. If more limiting system conditions are identified using the simultaneous transfer analysis on a particular interface, SCS will utilize the simultaneous TTC results as appropriate for system conditions.

- <u>Simultaneous TTC Considerations:</u> SCS determines simultaneous TTC values for the northern interfaces which include MISO, TVA, DUK, SCEG, and SC. SCS simultaneous TTC values determined by SCS are the combination of committed transfer capability, allocated to specific interfaces in accordance with the transmission service commitments, and remaining (incremental) capability, allocated among the northern interfaces. Potential limits to transfer are observed if the response factor (PTDF or OTDF) is 3% or greater and a viable operating procedure is not available (see "Contingencies and Monitoring"). The limit to transfer is observed for each interface which has a non-simultaneous response factor of 3% or greater.

- <u>Reservation Netting Practices for TTC/ATC Calculations</u>: As discussed above, TTC is determined from the following general equation:

TTC = FCITC + base transfers

It is important to understand the relationship of the TTC equation to netting. To simplify discussion, we will refer to an export transfer being included in an import study, though the reverse is possible as well (consideration of an import transfer being included in an export study). The export transfer <u>may</u> create an opposing flow to imports which relieves loading on the limiting element. If so, this loading relief will result in a higher FCITC value. However, the higher FCITC value is possible only if the opposing flow actually occurs in real-time.

To be conservative, the TTC equation treats export transfers as negative values causing them to be subtracted from the FCITC and effectively lowering TTC values. This is the default approach used by SCS in determining TTC values. SCS may also assess the following:

1. Do the base exports provide opposing flows that relieve the limiting elements? Base exports which do not provide opposing flows which relieve the identified limiting elements may be excluded from import TTC calculations, allowing higher TTC values to be used. If the base export is expected to result in some partial opposing flow (less than 100%) relief to the limiting element, then it could be appropriate to exclude the corresponding remaining percentage of the base export from the import TTC calculation (i.e., the percentage of the base export that is not expected to provide relief to the limiting element).

2. If the base export provides relief to the limiting element, will the exports (or a portion thereof) actually flow in real-time? Base exports with a high expectation to flow in real-time may be considered for netting purposes. "Netting" is the practice of not subtracting transfers deemed highly likely to flow in real-time from FCITC. This practice allows for higher TTC values by assuming that helpful opposing flows will be present in real-time.

As a result of this assessment, the default approach used by SCS in determining TTC values may be modified to include a portion or all of certain base exports in import TTC calculations and a portion or all of certain base imports in export TTC calculations.

2.1.2. Daily, Hourly, and Weekly TTC assessments

- Monthly TTC values are used to initially populate Weekly, Daily and Hourly TTC values. Daily and Hourly TTC values are updated by SCS 2-days out and more frequently if system conditions warrant. Transfer analysis is performed consistent with the parameters described for monthly TTC assessments with the following exceptions.

  2-Day Out and Day-Ahead

  - In addition to the models described in the monthly TTC assessments, “state estimation” models of real-time snapshots from the Energy Management System (“EMS”) may be used to develop Daily Models.
  - A load forecast is determined using a neural network application which considers the weather forecast and historical load values for similar time and weather conditions. Recent historical values are weighted more heavily in the algorithm.
  - Ambient adjusted ratings may be used.
  - In the daily transfer analysis, SCS tests all SBAA contingencies of transmission elements 100 kV and above having a PTDF of 1% or greater to the study transfer. SCS also tests all additional facilities that are provided by adjacent entities listed in Attachment C which passed the tests prescribed in MOD-030 R2.1.4, provided that such facilities have a PTDF of 1% or greater to the study transfer and are explicitly represented in the power flow model.

- Generation and Transmission Outages: Planned generation and transmission outages for both internal and external facilities are incorporated into power flow cases. Outages of external facilities are included to the extent such are provided by the entities in Attachment C. The outages included in the daily power flow cases are those scheduled to occur concurrently that are anticipated to materially impact TTC values during the day. Outages from other Transmission Service Providers that cannot be mapped to the Transmission model are not included in the model.

  SCS evaluates planned generation and transmission outages to determine a representative hour that would result in the greatest overall impact to transfer capabilities for the day being studied (often the peak load hour). After an hour is selected, all expected outages in this hour are modeled in the power flow case, provided that they are explicitly represented.

- Reservations and Schedules: When developing the Daily models, SCS adds all confirmed firm transmission service commitments that are expected to be scheduled for the study timeframe. Confirmed firm transmission service commitments, expected to be scheduled, that are provided by the entities in Attachment C are also included. These commitments are filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers.

2.1.3. Recalculation Frequency of TTC

To provide for reliable service and to meet NERC reliability requirements, SCS routinely updates the Transfer Capability evaluations as updated information becomes available. Transfer capabilities that are used in the monthly ATC calculations are updated at least once per calendar month. SCS updates TTCs used in daily and hourly ATC calculations at least once within the seven calendar days prior to the specified period. In the event of an unexpected outage of an SBAA 500 kV or higher transmission Facility or an SBAA transformer with a low-side voltage of 200 kV or higher, SCS recalculates all affected transfer capabilities, within 24 hours, provided such outage is expected to last 24 hours or longer.

2.1.4. Additional Coordination

- TTC assessments for PowerSouth: In addition to the requirements contained in the current versions of MOD-001 and MOD-028, TTC values for the AEC-SOCO and SOCO-AEC ATC Paths are further coordinated between SCS and PowerSouth. The values resulting from the monthly and daily TTC assessments represent the most limiting SOL between the SBAA and PowerSouth.

- TTC assessments for peninsular Florida: In addition to the requirements contained in the current versions of MOD-001 and MOD-028, SCS participates in the Florida-Southern Coordinating Group to develop coordinated Transfer Capability values between the SBAA and the Florida Reliability Coordinating Council ("FRCC"). The values resulting from the coordinated monthly and daily TTC assessments represent the most limiting SOL among all participating parties involved. These TTC values between the SBAA and the FRCC are calculated for SOCO-FL and FL-SOCO ATC Paths used by SCS. MEAG uses the FL-SOCO ATC Path for TRM (as described in SCS's TRMID). MEAG posts ATC Paths between MEAG and BAs in the FRCC interconnected with MEAG (FPC, FPL, JEA and TAL). For SOCO-FL, MEAG's ATC Paths are MEAG-FPC, MEAG-FPL, MEAG-JEA and MEAG-TAL. For FL-SOCO, MEAG's ATC Paths are FPC-MEAG, FPL-MEAG, JEA-MEAG and TAL-MEAG. MEAG receives: (1) TTC values for SOCO-FL from SCS and then allocates the SOCO-FL TTC values using allocation factors described in Attachment F to MEAG-FPC, MEAG-FPL, MEAG-JEA and MEAG-TAL, and (2) TTC values for FL-SOCO from SCS and then allocates the FL-SOCO TTC values using allocation factors described in Attachment F to FPC-MEAG, FPL-MEAG, JEA-MEAG and TAL-MEAG. On the ATC Paths in (1) and (2), MEAG allows reservations and scheduling up to MEAG's maximum rights by granting the MW amount of reservation or schedule on a given ATC Path (e.g., MEAG-FPC) and then reducing ATC values on the other ATC Paths (e.g., MEAG-FPL, MEAG-JEA and MEAG-TAL).

2.2. Existing Transmission Commitments ("ETC"): MEAG defines ETC as commitments for transmission service which exist at the time a transfer analysis is performed. Transmission service for network and native loads is represented in power flow analyses by modeling forecasted loads and serving them with the expected dispatch of the associated network resources. Firm PTP Transmission Service is represented in the power flow models as previously discussed in "Points of Power Injection and Extractions (Sources and Sinks)". The modeling treatment is consistent whether the existing transmission service commitment is OATT service or non-OATT (native load or grandfathered) service. Rollover rights are evaluated as a continuation of service in the zero to thirteen months postings unless the renewal deadline has expired. For each particular interface, service type, and time period, ATC is determined by subtracting the commitments on that interface from the respective TTC value in accordance with the formulas shown above. Firm ATC calculations consider only firm commitments. Non-firm ATC considers both firm and non-firm commitments.

2.3. Postbacks: Postbacks are positive adjustments to ATC as determined by MEAG's business practices. MEAG's business practices may include capacity that is posted back on OASIS as additional ATC as a result of: (i) customers not scheduling service; or (ii) customers' redirects of service to other ATC Paths.

2.3.1. Unscheduled Service: Transmission service commitments that are not scheduled (wholly or partially) result in the unscheduled portions being posted back to OASIS in the form of non-firm ATC. For example, if the holder of 100 MW of Daily Firm service on an ATC Path schedules only 80 MW during an upcoming hour, the remaining 20 MW will be posted back as non-firm ATC on that ATC Path for that hour.

2.3.2. Short-term Redirect: Firm PTP transmission customers may redirect their transmission service on a firm or non-firm basis, to any ATC Path where ATC is available.

2.3.2.1. If the redirect is to an ATC Path where firm service is available, the firm ATC will be decremented on the new ATC Path and firm ATC will be released on the original ATC Path.

2.3.2.2. If the redirect is to an ATC Path where only non-firm service is available, the non-firm ATC will be decremented on the new ATC Path; however, the customer will reserve the right to return to the original ATC Path and firm ATC will not be released on the original ATC Path. Non-firm ATC will be released on the original ATC Path.

2.4. Counterflows: Counterflows are adjustments to ATC that determine the amount of scheduled MW associated with MEAG's customers' transactions: (1) which will schedule or flow in the opposite direction on a ATC Path and (2) which MEAG determines can effectively be used to increase ATC.

2.4.1. Confirmed Transmission reservations and expected Interchange are addressed for firm and non-firm ATC calculations in Attachment B's formula "ATC (Path, Service Type and Time Period specific) = …" For firm and non-firm ATC calculations (including confirmed Transmission reservations and expected Interchange) MEAG only considers counterflows in the calculation of hourly (non-firm) ATC on external ATC Paths (ATC Paths with POR or POD external to SBAA). For internal ATC Paths (ATC Paths where both POR and POD are internal to SBAA), counterflows are set to zero.

2.4.2. The rationale for this treatment is that power flow associated with counterflows may not provide relief to constrained facilities that would enable a reliable increase in ATC values for time periods beyond one hour. Counterflows on internal ATC Paths are set to zero because power flows from serving internal load can have significant change in amount and direction with generation and load variations.

2.5. Transmission Reliability Margin ("TRM"): MEAG's allocations of TRM are defined in SCS's TRMID. The TRMID also contains SCS's TRM methodology. TRM values are maintained on MEAG's OASIS.

2.5.1. Databases used in TRM assessments: The following databases are utilized in the TRM assessment.

2.5.1.1. Southern Company Services – Transmission Dynamics Database for Transmission Planning Models

2.5.1.2. SERC Dynamics Study Group – Dynamics Database

2.5.1.3. NERC MMWG Dynamics Model

2.5.2. Conditions under which MEAG uses TRM: TRM, if any, is reserved and used only to calculate firm ATC for imports and such capacity is made available to the market on a non-firm basis. TRM, if any, does not include any components of uncertainty that may be included in CBM.

2.6. Capacity Benefit Margin ("CBM"): MEAG Power has discontinued CBM. If it is reinstated, a CBMID will be developed and the resulting CBM values will be maintained on MEAG's OASIS if CBM is reserved.

Attachment C:

Transmission Operators and Transmission Service Providers from which SCS Receives Data for Use in Calculating TTC

TTC calculations are performed by the Southern Balancing Authority ("SBA"); Southern Company Services, Inc. –Trans ("SCS") is the Balancing Authority for MEAG. MEAG receives the TTC calculations and then calculates the other components (ATC, ETC, CBM, TRM, Postbacks, and counterflows). The list of Transmission Operators and Transmission Service Providers from which MEAG may receive data for use in calculating TTC is the list used by SBA and SCS. The data is received by SCS for use in calculating TTC. MEAG may receive some of the data for purposes other than calculating TTC.

1. City of Tallahassee
2. Duke Energy Carolinas
3. Entergy
4. Midcontinent Independent System Operator, Inc.
5. Florida Power & Light Co.
6. Florida Reliability Coordinating Council, Inc.
7. Georgia System Operations Corporation
8. Georgia Transmission Corporation
9. JEA
10. Municipal Electric Authority of Georgia
11. PowerSouth Energy Cooperative
12. Duke Energy Florida
13. South Carolina Electric & Gas Company
14. South Carolina Public Service Authority
15. Southern Company Services, Inc. – Transmission
16. South Mississippi Electric Power Association
17. Southwest Power Pool, Inc. – ICTE
18. Tennessee Valley Authority
19. USACE – Savannah District

Attachment D:

Transmission Operators and Transmission Service Providers from which MEAG Receives Data for Use in Calculating ATC

1. Georgia System Operations Corporation
2. Municipal Electric Authority of Georgia
3. Southern Company Services, Inc. – Trans

Attachment E:

Transmission Operators and Transmission Service Providers to which MEAG Provides Data for Use in Calculating Transfer Capability

The list of Transmission Operators and Transmission Service Providers to which MEAG provides data for use in calculating Transfer Capability is the list used by MEAG's Balancing Authority; Southern Company Services, Inc. –Trans ("SCS") is the Balancing Authority for MEAG. MEAG provides data to SCS; and SCS may provide MEAG's data to the following entities.

1. City of Tallahassee
2. Duke Energy Carolinas
3. Midcontinent Independent System Operator, Inc.
4. Florida Power & Light Co.
5. JEA
6. Municipal Electric Authority of Georgia
7. PowerSouth Energy Cooperative
8. Duke Energy Florida
9. South Carolina Electric & Gas Company
10. South Carolina Public Service Authority
11. Southern Company Services, Inc. – Transmission
12. Tennessee Valley Authority
13. USACE – Savannah District

Attachment F:

Description of the Allocation Process MEAG and SCS Uses to Allocate Transfer Capability among Multiple Owners or Users of an ATC Path

1. **Allocation Processes Applicable to MEAG:** Section 2.5 of the ATCID states that this Attachment F has a description of the allocation processes listed below that are applicable to MEAG.
   - **a.** There are no processes used to allocate Transfer Capability among multiple lines or sub-paths within a larger ATC Path.
   - **b.** Section 2 below contains a description of the process used to allocate Transfer Capabilities among multiple owners or users of an ATC Path.
   - **c.** There are no processes used to allocate Transfer Capabilities between Transmission Service Providers to address issues such as forward looking congestion management and seams coordination.

2. **Allocation Process:** The allocation process MEAG uses to allocate Transfer Capability (where allocation is done) is governed by the Integrated Transmission System Agreements (ITSAs). The ITSAs are three bi-lateral contracts between Georgia Power Company (a subsidiary of Southern Company) and Dalton Utilities, Georgia Transmission Corporation and Municipal Electric Authority of Georgia. Dalton Utilities, Georgia Power Company, Georgia Transmission Corporation, and the Municipal Electric Authority of Georgia are collectively referred to as the "ITS participants". The ITS participants periodically review the Transfer Capability of each Integrated Transmission System (ITS) interface (the ITSAs use the term "Interconnection" to refer to an interface) with non-Southern Balancing Authority Areas. Each ITS participant and their respective TOP (or TSP) receives an allocation for all ATC Paths in an ITS interface. The ATC Paths in ITS interfaces are listed in the table below. Allocations are applied to the ATC Path's calculated TTC to determine the appropriate TTC for each ITS participant.

3. Allocation Factors: The allocation factors determined by the ITS participants are used to allocate Transfer Capability among ITS participants and other Transmission Owners for an interface with non-Southern Balancing Authority Areas. First, the TTC values for the applicable ATC Paths listed in the table below are multiplied by a set of allocation factors to calculate the TTC megawatts that are allocated to ITS participants versus the TTC megawatts that are allocated to non-ITS participants. After the total allocation of TTC for all ITS participants has been determined, that value is multiplied by a second set of allocation factors to calculate the TTC megawatts that are allocated to each ITS participant.

4. ATC Paths with Allocation Factors: The allocation factors are applied to the following ATC Paths in ITS interfaces.

1. AEC-MEAG
2. DUK-MEAG
3. FPC-MEAG
4. FPL-MEAG
5. JEA-MEAG
6. MEAG-AEC
7. MEAG-DUK
8. MEAG-FPC
9. MEAG-FPL
10. MEAG-JEA
11. MEAG-SC
12. MEAG-SCEG
13. MEAG-TAL
14. MEAG-TVA
15. SC-MEAG
16. SCEG-MEAG
17. TAL-MEAG
18. TVA-MEAG