Entergy Available Transfer Capability Implementation Document

1. Introduction

1.1 Methodology for Calculating AFC: Entergy has selected the Flowgate Methodology, as described in Reliability Standard MOD-030-2, to calculate Available Flowgate Capability ("AFC") for each ATC Path for those Facilities within its Transmission operating area for each of the time periods specified in MOD-001-1a R2 and described in Section 8.

1.2 This document is the Entergy Available Transfer Capability Implementation Document ("ATCID") for the Entergy Transmission Service Provider area.

(a) The ATCID addresses compliance with the following Reliability Standards and Requirements:

(i) MOD-001-1a—Available Transmission System Capability Requirements R1 through R3 and R6 through R9.[1]

(ii) MOD-030-02—Flowgate Methodology.

2. Terminology

2.1 For the purpose of compliance with MOD-001-1a and MOD-030-2 Entergy is both the Transmission Service Provider for the Entergy Transmission Service Provider area and the Transmission Operator for the Entergy Transmission Operator area. In addition, Entergy is the Transmission Provider under the Entergy Open Access Transmission Tariff ("OATT" or "Tariff"). However, pursuant to the Entergy OATT, the tasks related to the calculation of Available Flowgate Capability for the Facilities within the Entergy Transmission Service Provider area are divided between Entergy and the Independent Coordinator of Transmission ("ICT"). This division of responsibilities is controlled by Attachment S to the Tariff, including the Transmission Service Protocol and other ICT Protocols appended thereto (collectively, the "ICT Protocols").

3. Procedure for Identifying Flowgates: Entergy includes Flowgates used in the AFC process based on the following criteria:

3.1 Results of a first Contingency transfer analysis for ATC Paths internal to Entergy's system up to the path capability such that at a minimum the first three limiting Elements and their worst associated Contingency combinations with an OTDF of at least 5% and within Entergy's system are included as Flowgates.

[1] Compliance with MOD-001-1a Requirements R4, R5, R9.1, and R9.2 is addressed through other procedures.

(a) Use first Contingency criteria consistent with those first Contingency criteria used in planning of operations for the applicable time periods, including use of Special Protection Systems.

(b) Only the most limiting element in a series configuration needs to be included as a Flowgate.

(c) If any limiting element is kept within its limit for its associated worst Contingency by operating within the limits of another Flowgate, then no new Flowgate needs to be established for such limiting elements or Contingencies.

3.2 Results of a first Contingency transfer analysis from all adjacent Balancing Authority source and sink (as defined in the ATCID) combinations up to the path capability such that at a minimum the first three limiting Elements and their worst associated Contingency combinations with an Outage Transfer Distribution Factor (OTDF) of at least 5% and within the Transmission Operator's system are included as Flowgates unless the interface between such adjacent Balancing Authorities is accounted for using another ATC methodology.

(a) Use first Contingency criteria consistent with those first Contingency criteria used in planning of operations for the applicable time periods, including use of Special Protection Systems.

(b) Only the most limiting element in a series configuration needs to be included as a Flowgate.

(c) If any limiting element is kept within its limit for its associated worst Contingency by operating within the limits of another Flowgate, then no new Flowgate needs to be established for such limiting elements or Contingencies.

3.3 Any limiting Element/Contingency combination at least within Entergy's Reliability Coordinator's Area that has been subjected to an Interconnection-wide congestion management procedure within the last 12 months, unless the limiting Element/Contingency combination is accounted for using another ATC methodology or was created to address temporary operating conditions.

3.4 Any limiting Element/Contingency combination within the Transmission model that has been requested to be included by any other Transmission Service Provider using the Flowgate Methodology or Area Interchange Methodology, where:

(a) The coordination of the limiting Element/Contingency combination is not already addressed through a different methodology, and

(i) Any generator within the Entergy Transmission Service Provider area has at least a 5% Power Transfer Distribution Factor (PTDF)

or Outage Transfer Distribution Factor (OTDF) impact on the Flowgate when delivered to the aggregate load of its own area, or

(ii) A transfer from any Balancing Area within the Entergy Transmission Service Provider area to a Balancing Area adjacent has at least a 5% PTDF or OTDF impact on the Flowgate.

(iii) Entergy may utilize distribution factors less than 5% if desired.

(b) The limiting Element/Contingency combination is included in the requesting Transmission Service Provider's methodology.

3.5 Interval for Updating Master List: Entergy uses this criteria to establish the list of Flowgates by creating, modifying, or deleting Flowgate definitions at least once per calendar year.

3.6 Revisions to Master List in Response to Requests: Entergy creates, modifies, or deletes Flowgates that have been requested in accordance with MOD-030-2 Requirement R2.1.4 within thirty calendar days from the request.

3.7 Criteria for Adding/Removing Monitored Flowgates

The ICT posts the Master List of Flowgates ("Master List") on OASIS, as well as a log of all changes thereto. The ICT or Entergy may propose to modify the Master List (on a permanent or temporary basis) by including new Flowgates or removing existing Flowgates. If an original Flowgate is renamed, the original name is noted on the Master List. For modifications proposed by Entergy (either permanent or temporary), Entergy documents and supplies to the ICT all studies, analyses and research conducted in connection with the proposed change. The ICT reviews and validates all proposed changes to the Master List to ensure that such changes are consistent with the criteria outlined below. For purposes of this Section 3.7, the responsibility of the ICT to "review and validate" means that the ICT reviews the inputs and results of any study or analysis and confirms that the study results reasonably reflect the application and product of the criteria specified in this Section 3.7.

(a) Adding Flowgates

Entergy uses the following process to add new Flowgates to the Master List. The ICT reviews and validates that new Flowgates are added to the Master List in accordance with the following criteria.

(i) When, through operational experience, a Flowgate violates the loading, stability, or voltage criteria for either normal operation or single contingency conditions as established in the Local Planning Criteria, Entergy adds the identified Flowgate to the Master List and the ICT updates the Master List on OASIS.

(ii) When new facilities, including, but not limited to, generating facilities and transmission facility additions or upgrades, are added to the Transmission System, Entergy performs studies to identify additional Flowgates to add to the Master List, in accordance with the criteria listed in subsection (i) above.

(iii) When a new transmission facility is added that relieves an existing Flowgate listed on the Master List, Entergy performs studies to determine whether a Flowgate should be identified to replace the unconstrained Flowgate on the Master List, in accordance with the criteria listed in subsection (i) above.

Flowgates outside of the Entergy Transmission System may also be included in the list of Flowgates to be monitored consistent with applicable NERC Reliability Standards. These external Flowgates are used to determine transfer capability values that may be limited by Flowgates external to the Entergy Transmission System.

(b) Removing Flowgates: Entergy uses the following process to remove Flowgates from the Master List. The ICT reviews and validates that the removal of Flowgates from the Master List is in accordance with the following process:

(i) On an annual basis, Entergy reviews the AFC Impact Logs to determine which Flowgates on the Master List have not limited service on the Facilities in the Entergy Transmission Service Provider area.

(ii) From the resulting list of Flowgates identified in the annual process, Entergy derives a subset of Flowgates with loading levels that do not exceed 60 percent of the applicable rating to populate a list of Flowgates that are candidates for removal. This list is generated as follows: (1) Flowgates that did not appear in any final TSR evaluation are given the highest priority for removal and are at the top of the proposed removal list; and (2) evaluated Flowgates with the smallest post-request loading as a function of TFC are added to the list in ascending order of magnitude.

(iii) Entergy reviews the list of removal candidates against historical real-time flow data to identify the post-contingent loading level of each Flowgate candidate proposed for removal. Where the historical projected post-contingent loading violates the facility rating, the Flowgate is excluded from the list of removal candidates.

(iv) The resulting list is sorted by post-request loading level (as identified in subsection (ii) above) and prioritized for removal

from the Master List. If the number of Flowgates identified through this removal review process exceeds the number of Flowgates added to the Master List in the review year, Entergy removes the same number of Flowgates as were added to the Master List in the review year. If fewer Flowgates are identified by the removal review process than were added during the review year, Entergy expands the total number of Flowgates on the Master List as necessary to maintain reliability, of the Facilities in the Entergy Transmission Service Provider area in accordance with NERC standard MOD-030. Entergy provides the ICT with an updated Master List and the ICT posts the updated Master List on OASIS.

(c) Adding and Removing Temporary Flowgates: Entergy uses the following process to add and remove temporary Flowgates to the Master List. The ICT reviews and validates that temporary Flowgates are added to the Master List in accordance with the following criteria.

(i) Entergy identifies one or more Flowgates that may be necessary to add to the AFC Process due to a temporary system configuration or condition in accordance with the criteria listed in subsection 3.7(a)(i) above. Temporary system configurations and conditions include planned or unplanned transmission facility outages and other temporary or unforeseen system events.

(ii) The temporary Flowgate is added to the AFC Process in advance of the temporary system configuration/condition or after the temporary condition is detected depending on the circumstances. The temporary Flowgate is applied to one or more of the AFC horizons (Operating, Planning and/or Study Horizons) depending on the expected duration of the temporary system configuration or condition. Entergy provides the ICT with an updated Master List and the ICT posts the updated Master List on OASIS.

Entergy monitors the temporary system configuration or condition resulting in the addition of a temporary Flowgate. Once the temporary configuration or condition has ended, the temporary Flowgate implemented as a result of the temporary configuration or condition is identified for removal. Entergy provides the ICT with an updated Master List and the ICT posts the updated Master List on OASIS.

3.8 Constant Number of Flowgates: The criteria used by Entergy to identify the sets of Transmission Facilities as Flowgates that are to be considered in AFC calculations is designed to retain a constant number of Flowgates (approximately 300 Flowgates) on the Master List. Expansion of this total number of Flowgates may be necessary as system conditions change.

4. Total Flowgate Capability

4.1 Establishing TFC for Each Defined Flowgate: Entergy establishes the TFC of each defined Flowgate as equal to (a) for thermal limits, the System Operating Limit (SOL) of the Flowgate and (b) for voltage or stability limits, the flow that will respect the SOL of the Flowgate.

(a) Calculation of Total Flowgate Capability: TFC is calculated based on the thermal, voltage, stability or contractual limits for the facilities that define the Flowgate. For the TieCap Flowgates used to evaluate power flows between the Entergy Control Area and each First-Tier External Control Area and Embedded Control Area, the TFC value is the total interface rating between the two Control Areas. The rating for a TieCap Flowgate is defined by either: (1) the thermal limit of all transmission facilities that define the interface; (2) a contractual limit contained in operating agreements; or (3) the maximum generation capability or load of that Control Area. For PMax Flowgates, the TFC value represents the maximum rating of the generating facility pursuant to the relevant LGIA or other interconnection and operating agreement. For all other Flowgates, the TFC value is based on the thermal, stability or voltage limits as calculated in accordance with Section 4.1(b). The Master List of Flowgates identifies which Flowgates are based on voltage or stability. All other Flowgates are based on thermal limits.

(b) Transmission Facility Ratings: For purposes of TFC calculations, Entergy's facility ratings are established in accordance with NERC Reliability Standard FAC-008 and FAC-009 (or any successor standards). Entergy uses the normal rating (as defined by NERC Reliability Standards) for purposes of TFC calculations. The TSR Business Practices describe the basis for Entergy's facility ratings.

(c) TFC Assumptions: When calculating Total Flowgate Capability (TFC) Entergy will use assumptions no more limiting than those used in the planning of operations for the corresponding time period studied, providing such planning of operations has been performed for that time period.

4.2 Requirement for Establishing and Communicating TFC: At a minimum, Entergy will establish the TFC for each defined flowgate once per calendar year.

Within seven calendar days of the verification and approval of a change in a Facility Rating that would affect the TFC of a Flowgate used in the AFC process, Entergy will update the TFC for that Flowgate.

5. Narrative Explanation of Calculation of AFC:

The following section contains a narrative description of Entergy's process for calculating AFC for its Transmission Service Provider area. A flowchart illustrating this process is included in Appendix 1 to the Entergy OATT Attachment C.

AFC Assumptions: When calculating AFC Entergy will use assumptions no more limiting than those used in the planning of operations for the corresponding time period studied, providing such planning of operations has been performed for that time period.

5.1 Calculation of AFC Values:

(a) Base Case Models: The AFC Process generates Base Case Models that simulate anticipated Entergy Transmission Service Provider facility conditions based on the data inputs and assumptions described in this Section 5.

(i) In accordance with Sections 8.1 and 8.2 of the Transmission Service Protocol, Entergy maintains and services the AFC Software, including webTrans, RFCALC, and PAAC. Entergy utilizes the respective vendors of these software applications to provide maintenance and updates. webTrans is a software application developed by OATi used to process TSRs and to callculate AFC values, and serves as the interface to webOASIS. webTrans is hosted by OATi. RFCALC is a software application developed by Alstom and is used to calculate base flows, response factors, and the most limiting flowgate for the operating and planning horizons. PAAC is a software application developed by POWERGEM and is used to calculate base flows, response factors, and the most limiting flowgate for the study horizon. Under Sections 6 and 8 of the Transmission Service Protocol, Entergy is also responsible for supplying data inputs and information necessary for creating EMS-Based Models and Monthly Base Case Models. The ICT is responsible for reviewing and validating the data inputs, information and Base Case Models. For purposes of this Section 5, the responsibility of the ICT to "review and validate" means that the ICT takes reasonable steps to ensure that the data inputs are properly loaded and reflected in either the AFC Software or Entergy's modeling processes and that the resultant AFC values: (1) reasonably reflect the application and product of AFC Software or Entergy's modeling processes; and (2) are reasonably consistent with the current topology of the Entergy Transmission System.

(b) Non-Firm AFC Formula

$$\mathbf{AFC_{NF} = TFC - ETC_{Fi} - ETC_{NF} - CBM_{Si} - TRM_{Ui} + Postbacks_{NF} + counterflows_{NF}}$$

The Entergy formula:

$$\mathbf{AFC_{NF} = TFC - (ETC_{Fi} + ETC_{NF} - counterflows_{NF}) - CBM_{Si} - TRM_{Ui} + Postbacks_{NF}}$$

Where:

$\mathbf{(ETC_{Fi} + ETC_{NF} - counterflows_{NF})}$ = Base Flow + Remaining Firm and Non-Firm TSRs in a pending or active state not included in Base Flow

Base Flow = Positive Direction Flow - (Counterflow direction flow * (1 - Counterflow factor))

Positive Direction Flow is the flow amount in base flow that flows in the defined direction of the flowgate.

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

TFC is the Total Flowgate Capability of the Flowgate.

$\mathbf{ETC_{Fi}}$ is the sum of the impacts of existing firm Transmission commitments for the Flowgate during that period.

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

$\mathbf{CBM_{Si}}$ is the impact of any schedules during that period using Capacity Benefit Margin.

$\mathbf{TRM_{Ui}}$ 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.

$\mathbf{Postbacks_{NF}}$ are changes to non-firm Available Flowgate Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.

$Counterflows_{NF}$ are adjustments to non-firm AFC as determined by Entergy and specified in the Entergy ATCID.

Counterflow factor is a factor used to remove a portion of the counterflow from the Base flow calculation.

Base Flow is the power flow impact attributable to Existing Transmission Commitments that are modeled as discrete injections or withdrawals in the Base Case Models. In the Operating and Planning Horizon, Base Flow includes both Firm and Non-firm Commitments. In Study Horizon, Base Flow includes Firm Commitments.

(c) Firm AFC Formula

$$\mathbf{AFC_F = TFC - ETC_{Fi} - CBM_i - TRM_i + Postbacks_{Fi} + counterflows_{Fi}}$$

The Entergy formula:

$$\mathbf{AFC_F = TFC - (ETC_{Fi} - counterflows_{Fi}) - CBM_i - TRM_i + Postbacks_{Fi}}$$

Where:

$(ETC_{Fi} - counterflows_{Fi})$ = Adjusted Base Flow + Remaining firm TSRs in a pending or active state not included in base flow

Adjusted Base Flow = Base Flow – Impact from Non-Firm TSRs included in Base Flow

Base Flow = Positive Direction Flow - (Counterflow direction flow * (1 - Counterflow factor))

Positive Direction Flow is the flow amount in base flow that flows in the defined direction of the flowgate.

AFC_F is the firm Available Flowgate Capability for the Flowgate for that period.

TFC is the Total Flowgate Capability of the Flowgate.

ETC_{Fi} is the sum of the impacts of existing firm Transmission commitments for the Flowgate during that period.

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

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

$Postbacks_{Fi}$ are changes to firm AFC due to a change in the use of Transmission Service for that period, as defined in Business Practices.

$Counterflows_{Fi}$ are adjustments to firm AFC as determined by Entergy and specified in the Entergy ATCID.

Counterflow factor is a factor used to remove a portion of the counterflow from the Base flow calculation.

Base Flow is the power flow impact attributable to Existing Transmission Commitments that are modeled as discrete injections or withdrawals in the Base Case Models. In the Operating and Planning Horizon, Base Flow includes both Firm and Non-firm Commitments. In Study Horizon, Base Flow includes Firm Commitments.

(d) Calculation of the Impact of ETC for Firm Commitments: When calculating the impact of ETC for firm commitments (ETC_{Fi}) for all time periods for a Flowgate, Entergy sums the following:

(i) The impact of firm Network Integration Transmission Service, including the impacts of generation to load, in the model referenced in R5.2 for the Entergy Transmission Service Provider area, based on:

(1) Load forecast for the time period being calculated, including Native Load and Network Service load

(2) Unit commitment and Dispatch Order, to include all designated network resources and other resources that are committed or have the legal obligation to run as specified in the Entergy Transmission Service Provider's ATCID.

Entergy explanation: The load forecast for the time period being calculated, including Native Load and Network Service load, is modeled in the base cases which are used to compute the baseflow component of AFC formula as described in Section 5.1(b) and (c). The Unit Commitment and Dispatch Order, to include all designated network resources and other resources that are committed or have the legal obligation to run, are also modeled in base cases which are used to compute the baseflow component of AFC formula as described in Section 5.1(b) and (c). The ETC_{Fi} as described in Section 5.1(b) and (c) is derived using the baseflow,

thus it includes sum of firm Network Integration Service. The details on load forecast and generation dispatch modeling in the base case are described in Section 5.2.

(ii) The impact of any firm Network Integration Transmission Service, including the impacts of generation to load in the model referenced in R5.2 and has a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed based on:

(1) Load forecast for the time period being calculated, including Native Load and Network Service load

(2) Unit commitment and Dispatch Order, to include all designated network resources and other resources that are committed or have the legal obligation to run as specified in the Entergy ATCID.

Entergy Explanation:

Operating and Planning Horizons

Entergy incorporates the load forecast of all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed in its AFC calculations. Entergy also incorporates the dispatch order for generators in adjacent transmission service provider areas if the Transmission Service Provider has provided such information to Entergy. In the absence of generation merit order information in the operating and planning horizon, Entergy dispatches Automatic Generation Control (AGC) units of all adjacent Transmission Service Providers areas and the areas of any other Transmission Service Providers with which coordination agreements have been executed based on reserve margin.

Study Horizon

For the Study Horizon, the load forecast, including Native Load and Network Service load, as well as unit commitment and Dispatch Order, including all designated network resources and other resources that are committed or have the legal obligation to run as specified in the Entergy ATCID, are incorporated in the calculation of the impact of ETC for firm commitments based on the data contained in the quarterly models received by Entergy through the Eastern Interconnection Reliability Assessment Group

Multi-Regional Modeling Working Group (ERAG MMWG) process.

(iii) The impact of all confirmed firm Point-to-Point Transmission Service expected to be scheduled, including roll-over rights for Firm Transmission Service contracts, for the Entergy Transmission Service Provider area.

Entergy explanation: The impact of all confirmed firm Point-to-Point Transmission Service expected to be scheduled including roll-over rights for Firm Transmission Service contracts, for the Entergy Transmission Service Provider area is modeled in basecase models. The baseflow calculated by using the basecase models includes the impact of these firm Point-to-Point schedules. The ETC_{Fi} as described in Section 5.1(b) and (c) is derived using the baseflow, thus it includes the impact of these schedules. A detailed description of modeling the firm Point-to-Point service that is expected to be scheduled, can be found in Section 5.3(b).

(iv) The impact of any confirmed firm Point-to-Point Transmission Service expected to be scheduled, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, including roll-over rights for Firm Transmission Service contracts having a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Entergy Explanation:

Operating Horizon

In the operating horizon, Entergy uses scheduling information from NERC e-Tag data to model the impact of any confirmed firm Point-to-Point Transmission Service expected to be scheduled, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, including roll-over rights for Firm Transmission Service contracts having a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Planning and Study Horizons

In the planning and study horizons, Entergy uses the firm Point-to-Point Transmission Service information from the Multi-Area Modeling Working Group, Near-Term Study Group (MMWG NTSG) modeling process to model to model the impact of any confirmed firm Point-to-Point Transmission Service expected to be scheduled, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, including roll-over rights for Firm Transmission Service contracts having a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy.

(v) The impact of any Grandfathered firm obligations expected to be scheduled or expected to flow for the Entergy Transmission Service Provider area.

Entergy explanation: The Grandfathered firm obligations expected to be scheduled or expected to flow are included in the baseflow component or are algebraically accounted for in the calculation of ETC_F as described in Section 5.1(b) and (c). The details of modeling grandfathered reservations or schedules can be found in Section 5.3(b).

(vi) The impact of any Grandfathered firm obligations expected to be scheduled or expected to flow that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Entergy explanation:

Operating Horizon

In the operating horizon, Entergy uses scheduling information from NERC e-Tag data to model the impact of any Grandfathered firm obligations expected to be scheduled or expected to flow that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Planning and Study Horizons

In the planning and study horizons, Entergy uses the information from the Multi-Area Modeling Working Group, Near-Term Study Group (MMWG NTSG) modeling process to model the impact of any Grandfathered firm obligations expected to be scheduled or expected to flow that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

(vii) The impact of other firm services determined by Entergy.

Entergy explanation: Section 5.3 describes how the impact of firm service is included in the AFC process. The firm service is included in the baseflow component or is algebraically accounted for in the calculation of ETC_{FI} as described in Section 5.1(b) and (c).

(e) Calculation of the Impact of ETC for Non-Firm Commitments: When calculating the impact of ETC for non-firm commitments (ETC_{NFI}) for all time periods for a Flowgate Entergy sums:

(i) The impact of all confirmed non-firm Point-to-Point Transmission Service expected to be scheduled for the Entergy Transmission Service Provider area.

Entergy explanation: The impact of confirmed non-firm Point-to-Point service is included in the baseflow component or is algebraically accounted for in the calculation of ETC_{FI} as described in Section 5.1(b) and (c). Non-Firm PTP Service Reservations are modeled at their respective Reservation capacity levels. The details on modeling these reservations are described in Section 5.3(b).

(ii) The impact of any confirmed non-firm Point-to-Point Transmission Service expected to be scheduled, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Entergy explanation:

Entergy uses scheduling information from NERC e-Tag data to model the impact of any confirmed non-firm Point-to-Point Transmission Service expected to be scheduled, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

(iii) The impact of any Grandfathered non-firm obligations expected to be scheduled or expected to flow for the Entergy Transmission Service Provider area.

Entergy explanation: The Grandfathered non-firm obligations expected to be scheduled or expected to flow are included in the baseflow component or is algebraically accounted for in the calculation of ETC_{NFi} as described in Section 5.1(b) and (c). The details of modeling grandfathered reservations or schedules can be found in Section 5.3(b).

(iv) The impact of any Grandfathered non-firm obligations expected to be scheduled or expected to flow that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Entergy explanation:

Entergy uses scheduling information from NERC e-Tag data to model the impact of any Grandfathered non-firm obligations expected to be scheduled or expected to flow that have a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

(v) The impact of non-firm Network Integration Transmission Service serving Load within the Entergy Transmission Service Provider area (i.e., secondary service), to include load growth, and losses

not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

Entergy explanation: The impact of non-firm Network Integration Transmission Service is included in the baseflow component or is algebraically accounted for in the calculation of ETC_{NFi} as described in Section 5.1(b) and (c). The details of modeling this non-firm service are described in Section 5.3(a).

(vi) The impact of any non-firm Network Integration Transmission Service (secondary service) with a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

Entergy explanation:

Entergy uses scheduling information from NERC e-Tag data to model the impact of any non-firm Network Integration Transmission Service (secondary service) with a distribution factor equal to or greater than the percentage used to curtail in the Interconnection-wide congestion management procedure used by Entergy, filtered to reduce or eliminate duplicate impacts from transactions using Transmission service from multiple Transmission Service Providers, for all adjacent Transmission Service Providers and any other Transmission Service Providers with which coordination agreements have been executed.

(vii) The impact of other non-firm services determined by Entergy.

Entergy explanation: Section 5.3 describes how the impact of non-firm service is included in AFC process. The non-firm service is included in the baseflow component or is algebraically accounted for in the calculation of ETC_{NFi} as described in Section 5.1(b) and (c).

5.2 Transmission Model to Determine AFC

(a) Entergy develops and uses a Transmission model to determine AFC that meets the following criteria:

(i) It contains generation Facility Ratings, such as generation maximum and minimum output levels, specified by the Generator Owners of the Facilities within the model.

(ii) It is updated at least once per day for AFC calculations for intra-day, next day, and days two through 30.

(iii) It is updated at least once per month for AFC calculations for months two through 13.

(iv) It contains modeling data and system topology for the Facilities within its Reliability Coordinator's Area. The model may use equivalent representation of radial lines and Facilities 161 kV or below.

(v) It contains modeling data and system topology (or equivalent representation) for immediately adjacent and beyond Reliability Coordination Areas.

(b) Model Used: When calculating AFC, Entergy uses the models it has developed.

(c) Responsibilities: Under Sections 6 and 8 of the Transmission Service Protocol, Entergy is responsible for supplying (or collecting) the data inputs and information necessary for creating the hourly and daily EMS-Based Models and the Monthly Base Case Models. For the Operating and Planning Horizons, the EMS-Based Models are created by relying on data inputs collected by the Entergy and data taken from Entergy's EMS State Estimator. For the Study Horizon, Entergy creates Monthly Base Case Models for use with off-line power flow applications. The Monthly Base Case Models are derived from the Seasonal Base Case Models developed pursuant to the NERC and SERC regional modeling processes described in Attachment C and Attachment D to the Entergy Tariff. Sections 5.2 to 5.5 below describe the process used to create the EMS-Based Models and the process used by Entergy to create Monthly Base Case Models from the Seasonal Base Case Models. The ICT is responsible for reviewing and validating the data inputs, information and Base Case Models supplied by Entergy. The ICT's "review and validation" responsibility obligates the ICT to take reasonable steps to ensure that the data inputs are properly loaded and reflected in Entergy 's modeling processes and that the resultant AFC values: (1) reasonably reflect the application and product of these modeling processes; and (2) are reasonably consistent with the current topology of the Entergy Transmission System.

LSEs, or their designated agents, are required to submit the load and generation dispatch data for use in the AFC Process as described below. The fact that Entergy develops load and generation forecast methodologies to account for instances where an LSE, or its designated agent, has failed to supply this data or where the supplied data does not comply with the applicable requirements does not eliminate or alter the obligation on LSEs, or their designated agents, to supply the required data in the first instance.

The process and format for LSEs, or their designated agents, to submit load and generation dispatch data required under Attachment K is governed by those Tariff provisions. The process and format for LSEs, or their designated agents, to submit other load and generation dispatch data used in AFC calculations is governed by Attachment C to the Entergy Tariff and any applicable TSR Business Practices, except that the provisions of Section 9.2 of Attachment K shall apply to all load and generation data supplied by LSEs, or their designated agents, that qualifies as CEII or Confidential Information.

(d) Load Forecasts

(i) Operating and Planning Horizons: LSEs, or their designated agents, are required to submit load forecast data for their respective loads through a secure Web-based portal. The data submitted must include the forecasted hourly load for next 11 days and forecasted peak-hour load for the next 24 days. The TSR Business Practices further specify the format, content and timing of the load data submission. If a LSE, or its designated agent, does not supply load forecast data for a particular time period pursuant to this Section, Entergy creates a load forecast for purposes of calculating AFC values by assigning these non-forecasted areas a factor derived using historical load values for the LSE. The TSR Business Practices further describe the process and format for LSEs, or their designated agents, to submit the required load forecast data for the Operating and Planning Horizons.

(ii) Study Horizon: Load forecast data for LSEs is based on the data provided by those LSEs pursuant to Attachment K to the Tariff. Entergy uses this load forecast data in the development of the Monthly Base Case Models. If no such data is provided, Entergy defines the load level based on a monthly scaling factor. The monthly scaling factor utilizes the peak historical load for the LSE and/or Entergy as a reference. Cogeneration, industrial, and auxiliary load is assumed to be constant in each month.

(e) Generation Dispatch Forecasts

(i) Operating and Planning Horizons: LSEs, or their designated agents, are required to submit generation dispatch data for their loads through the same secure Web-based portal used for the submission of load data. LSEs, or their designated agents, have the option of submitting generation dispatch data in one of three formats: (1) Stack Format; (2) Hourly Format; and (3) Unit Commitment Format (UC Format). If a LSE, or its designated agent, fails to properly submit generation dispatch data in one of these formats, RFCALC relies on the data identified in Section

5.3(a)(i)(4) under the Default Format. The TSR Business Practices further describe the process and format for LSEs, or their designated agents, to submit the required generation dispatch forecast data for the Operating and Planning Horizons.

(1) Stack Format: LSEs that choose the Stack Format option are required to submit three separate lists (or "stacks") of Reservations for Network Resources meeting their load, with each list arranged in the dispatch order preferred by the LSE with the resource to be dispatched first listed first and the resource to be dispatched last listed last. A separate stack should be submitted for each of the following periods: (1) the peak hours (HE 7-22) for each day of the next 11 days; (2) the off-peak hours (HE 1-6, 23-24) for the next 11 days; and (3) the peak hours for the next 24 days.

The Reservations listed in each Stack Format file must be identified by OASIS ID numbers. Only Reservations may be submitted in the Stack Format file. TSRs cannot be submitted in the Stack Format file. Only Reservations serving the LSE's load can be specified in the Stack Format file. The sum total of the Reservation capacity listed in the Stack Format file must be at least equal to the highest forecasted load and losses in each hour of the three periods identified above. To the extent that partial or full requirements customers included in load of Entergy's Native Load Customers submit separate generation dispatch data, the dispatch file that is provided is not required to have generation match load and losses.

(2) Hourly Format: LSEs that choose the Hourly Format option are required to submit a forecasted hourly dispatch for each hour of the next 11 days, (Days 1-11) and for the peak-hour load for each day of the next 24 days (Days 12-35). The forecasted hourly and peak-hour dispatch must be provided on a Reservation-specific basis. Resources that do not currently have an OASIS ID number are required to obtain an OASIS ID number that is used for purposes of this option. Only Reservations may be submitted in the Hourly Format. TSRs cannot be submitted in the Hourly Format file. The forecasted hourly dispatch listed in the Hourly Format file must be equal to the forecasted load and losses for each time point. To the extent that partial or full requirements customers included in load of Entergy's Native Load Customers submit separate generation dispatch data, the dispatch file that is provided is not required to have generation match load and losses.

(3) Unit Commitment Format: LSEs that choose the UC Format option are required to submit the following information:

a. A UC Format file that contains the LSE's Network Resource Reservations and the following information for those Network Resources: (1) minimum and maximum run levels as established in the relevant LGIA, other interconnection and operating agreement or power supply arrangement; (2) resource availability (*i.e.*, outage schedule); and (3) a forecasted hourly dispatch of those resources for each hour of the next 11 days, (Days 1-11) and for the peak-hour load for each day of the next 24 days (Days 12-35). This forecasted hourly dispatch, standing alone, does not have to equal total load and losses but cannot exceed total load and losses.

b. One or more Stack Format files containing the LSE's Reservations arranged in dispatch order. A separate Stack Format is required for each period (peak during the next 11 days, off-peak during the next 11 days, and peak for the next 20 days) for which the UC Format file is insufficient to meet load and losses in any hour.

The UC and Stack Format files, when combined, must provide sufficient resources to meet forecasted load and losses in each hour of the three periods identified above. To the extent that partial or full requirements customers included in the load of Entergy's Native Load Customers submit separate generation dispatch data, the dispatch file is not required to have generation match load and losses. Only Reservations may be submitted in the UC Format. TSRs cannot be submitted in the UC Format files. The TSR Business Practices set forth the requirements for types of Reservations that may be included in UC Format files.

(ii) Study Horizon: LSEs are required to provide planned and unplanned outage data and a Priority Dispatch file for their respective Network Resources under this Section. The Priority Dispatch file contains the LSE's preferred priority stack dispatch for its Network Resources. The TSR Business Practices describe the process and format for submitting such information, including the requirements related to the types of Reservations that may be included in the Priority Dispatch file.

Because the Monthly Base Case Models represent the single peak-hour for each month, any Network Resources that are scheduled to be offline for at least two weeks during the month are treated as out-of-service in the peak-hour model used for the entire month. If two Network Resources in the same transmission planning region are out of service at non-overlapping intervals during the month, only one Network Resource is modeled offline. In determining which Network Resource to model offline, Entergy will model the Network Resource with the largest facility rating, unless the other Network Resource has a more significant reliability impact.

(iii) Submission Of Load and Generation Forecast Data for Operating and Planning Horizons

Entergy maintains a "Load Customer Upload" website to allow Customers the ability to upload the required data files into the AFC Process. The site is accessible via OASIS, using the link for "Entergy Load Customer Upload" provided under "Special Links" on the OASIS General Information Page. The Load Customer Upload website can also be accessed using the following link (note that you must be logged into the Production Node of Entergy's OASIS for this link to work):

https://www.oasis.oati.com/woa/woa-home-show-secure-doc.wml?ProviderDocsID=450540508&Provider=EES

Detailed instructions and guidance for using the Load Customer Upload website are provided in the "Load Customer Upload User's Manual," which is posted on OASIS and can be accessed using the following link:

https://www.oasis.oati.com/woa/docs/EES/EESdocs/LCU_UsersManual.doc

Specific format requirements for uploaded data files are provided in the "Functional Specifications Document," which is posted on OASIS and can be accessed using the following link:

https://www.oasis.oati.com/woa/docs/EES/EESdocs/NC_LF_UC_DataInputFunctionalSpecification.doc

(f) Generation Dispatch for Qualifying Facilities: In the Operating and Planning Horizon, Qualifying Facilities are dispatched at a net injection level of zero MW. In the Study Horizon, Qualifying Facilities are dispatched to the level of the relevant facility's host load such that the host load is served entirely by the Qualifying Facility. Any generation in excess of the amount required to serve the Qualifying Facility's host load

is modeled as follows. Network Resource Reservations sourced from a Qualifying Facility are added to that facility's dispatch level as described in Section 5.3(a)(i) (Operating and Planning Horizons) and Section 5.3(a)(ii) (Study Horizon). Reservations for PTP Service are added to a Qualifying Facility's dispatch level in accordance with Section 5.3(b).

(g) Generating Facility Operating Characteristics: Generating Facility Owners in the Entergy Transmission Service Provider area, in all adjacent Transmission Service Provider area, and in any Transmission Service Provider area with which coordination agreements have been executed are required to provide the following information for use in the AFC Process: facility ratings, operating characteristics, minimum and maximum run levels, planned and unplanned outages, and derates. The TSR Business Practices specify the format and process for submitting such information.

Note on generation outages: In considering generation outages for generation on the Entergy system in its Flowgate calculations, Entergy models the generation outages for generation designated as Network Resources under the Entergy OATT in the manner described in Section 5.2(e).

Outages of generation resources internal to the Entergy system that have not been designated as network resources under the Entergy OATT, such as Independent Power Producers located on the Entergy system, are not modeled. Instead, these generation resources are modeled in accordance with the Transmission Service Reservations for which the resources are PORs. This allows Entergy to reflect the expected operation of the resources in the transmission models used in Entergy's Flowgate capability calculations.

Entergy uses the generation Facility Ratings specified by the Generating Facility Owners in the Transmission model to determine AFC.

(h) Transmission System Topology and Outages

(i) Operating and Planning Horizons: The EMS-Based Models used in the Operating and Planning Horizons include a detailed representation of Entergy's Control Area and Transmission System and Embedded Control Areas. For the first three hours of the Operating Horizon, transmission system topology is supplied to RFCALC from the EMS State Estimator. Entergy adjusts this topology for Hours 4 through Day 31, based on planned and unplanned transmission facility outage schedules. Transmission outages (planned and unplanned) on facilities with voltage levels at 115 kV or above are incorporated into the Base Case Models for facilities in the Entergy Transmission Service Provider area. For all adjacent Transmission Service Provider areas and any

Transmission Service Provider area with which coordination agreements have been executed, Entergy models those outages with an impact on the reliability of the Entergy Transmission Service Provider area. The TSR Business Practices describe how transmission construction projects not currently in-service are treated for purposes of the EMS-Based Models.

For Days 1 through 7, Entergy applies scheduled outages for the hours when each outage is applicable when calculating AFC. For Days 8 through 31, if an outage is applicable in the peak hour of the day, the outage will be applied to the entire day when calculating AFC. If the outage is not applicable during the peak hour, then it will not be applied.

(ii) Study Horizon: The Monthly Base Case Models include a detailed representation of Entergy's Control Area and Transmission System and Embedded Control Areas. Transmission system topology is derived from the Seasonal and Monthly Base Case Models referenced in Section 5.2(c). The system topology represented in the Monthly Base Case Models is updated during each Study Horizon update, including planned and unplanned transmission outages and any changes to the transmission outage schedule that may occur between each update. When developing topology data inputs for the Monthly Base Case Models, Entergy assumes: (1) all 345 kV and 500 kV lines that are scheduled out of service for one hour or longer are modeled out of service for the entire month; and (2) all 115 kV – 230 kV lines that are scheduled out of service for at least five days are modeled out of service for the entire month. Entergy may model outages of certain critical 115 kV – 230 kV lines scheduled to be out of service for less than five days during the month if reliability concerns are anticipated during the outage. The TSR Business Practices describe how transmission construction projects not currently in-service are treated for purposes of the Monthly Base Case Models.

(i) Rollover Rights Under Section 2.2 of the Tariff: Reservations with rollover rights under Section 2.2 of the Entergy Tariff are assumed to expire if not renewed prior to the applicable deadline. If data collection for the relevant model is completed prior to the deadline for renewing rollover rights, Entergy assumes that rollover rights are exercised by the Customer. If data collection for the relevant model is completed after the applicable deadline and a renewal TSR has not been submitted, the prior Reservation is removed from the Base Case Models.

5.3 Modeling Base Flows

(a) Service to Network/Entergy's Native Load Customers

(i) Operating and Planning Horizon: RFCALC relies on the Stack, Hourly and UC Format files to model service to Network Load and Entergy's Native Load Customers provided that those files meet the requirements specified herein. Otherwise, RFCALC dispatches generation for Network Load and Entergy's Native Load Customers by relying on the Default Format, as described in Section 5.3(a)(i)(4). In the Operating Horizon, RFCALC also relies on Firm schedules to model services to these loads. Regardless of the format selected, generation is modeled to serve load in the following order (first-to-last): (1) Network Customers outside of Entergy's Control Area; (2) Network Customers and grandfathered customers in Entergy's Control Area; (3) Network Customers that are full or partial requirements customers of the entity supplying Entergy's Native Load Customers; and (4) Entergy's Native Load Customers. When necessary to enforce zonal import limits, the EMS-Based Models may also be dispatched by specific zones rather than on an entire Control Area basis pursuant to the TSR Business Practice related to enforcing zonal import limits.

(1) Hourly Format: For LSEs that choose the Hourly Format, RFCALC dispatches the Reservations as specified in the file. All Reservations (or portions thereof) that are not dispatched in the Hourly Format file but that are still available for scheduling by the LSE on a Firm basis are modeled in accordance with Section 5.3(c)(ii). If the dispatch provided in the Hourly Format file is insufficient to serve the load of that LSE, or is in excess of that load and losses, the Default Format is used except for LSEs that have alternative arrangements for serving the shortfall (*e.g.*, customers that have other full or partial requirements contracts or have reserved additional service). For these full or partial requirements customers, the hourly dispatch is not required to be equal to load and losses, and any unbalanced portion of their load is balanced with full or partial requirements resources.

(2) Stack Format: For LSEs that choose the Stack Format, RFCALC dispatches the Reservations sequentially in the dispatch order until the load requirements are met. Once RFCALC has dispatched the Reservations such that generation meets load and losses, any remaining Reservations (or portions thereof) are modeled in accordance with Section 5.3(c)(ii).

(3) UC Format: For LSEs that choose the UC Format, RFCALC dispatches the available Network Resources at

the hourly levels specified in the UC Format file. RFCALC uses the Reservations identified in the Stack Format file to meet load to the extent that the dispatch of the UC Format file does not fully serve the load and losses. While modeling Reservations specified in the Stack Format file, RFCALC only dispatches the portion of a Reservation not specified in the UC Format file. If there are any Reservations remaining after load has been met, those Reservations are modeled in accordance with Section 5.3(c)(ii).

(4) Default Format: All LSEs, or their designated agents, are required to provide generation dispatch and load forecast data in accordance with Section 5.2(d)(i) and Section 5.2(e)(i). In the event that the Transmission Provider serves as a LSE, the Transmission Provider is subject to Sections 5.2(d)(i) and 5.2(e)(i). RFCALC dispatches Reservations and resources according to the Default Format during any resynchronization where generation dispatch information has not been provided in accordance with Section 5.2(e)(i) (*i.e.*, where a valid Hourly, Stack or UC Format file is not available as described below). This includes instances where a LSE, or its designated agent, fails to meet its obligation to provide the file or where the file does not meet the applicable requirements.

Under the Default Format, generation is dispatched to meet load as follows. If the load data is provided by a LSE, RFCALC uses that data. If the load data is not provided, RFCALC derives the load by using a scale factor against the load forecast for Entergy's Native Load Customers. If the LSE has provided a UC Format file, RFCALC first models the UC Format file dispatch and then models all other Reservations (Network Resources and PTP Service sinking to the LSE) to meet the remaining load. RFCALC models these Reservations in reverse queue order and only dispatches the portion of a Reservation not specified in the UC Format file. If the LSE has not provided a UC Format file, or if the dispatch provided in the relevant dispatch files (UC and/or Stack or Hourly) are not sufficient to meet the load and losses of the LSE, RFCALC balances the remaining load and losses as follows:

a. For LSEs that have alternative arrangements for serving the shortfall (*e.g.*, customers that have other full or partial requirements contracts or have reserved additional service), any unbalanced portion

of their load is balanced with the full or partial requirements resources.

b. For LSEs that do not have such arrangements, RFCALC models any additional Reservations that sink to the LSE but that have not been specified in the Stack Format file (if such a file was provided). These Reservations are modeled in reverse queue order (*i.e.*, the last queued are modeled first). If the LSE provided an Hourly Format file and the dispatch in the file is insufficient to meet the LSE load or is in excess of load and losses, RFCALC will model the Reservations that sink to the LSE in reverse queue order. If the load is still not met after modeling all of the LSE's Reservations, RFCALC utilizes the AGC Facilities in the Control Area in which the load resides to meet the remaining load. If the load is still not met after exhausting all AGC Facilities, RFCALC adjusts the Net Interchange of the Control Area to balance the load. If the Net Interchange adjustment also fails to meet the load, the powerflow may diverge for that particular timepoint.

(ii) Study Horizon: Generation dispatch for service to Network Load and the load of Entergy's Native Load Customers will based on the Priority Dispatch file required under Section 5.2(e)(ii) to the extent that such a file is provided. To the extent a LSE, or its designated agent, fails to provide the Priority Dispatch file, service to that LSE's load is represented by modeling power purchase contracts designated as Network Resources in monthly or yearly increments or for which Secondary Network Service has been obtained in monthly increments and dispatching owned generating facilities that are Network Resources for that LSE to meet any shortfall between those contracts and load plus losses. To the extent that power purchase contracts exceed load plus losses, those contracts will be dispatched in reverse queue order until generation meets load plus losses. The initial dispatch levels for each LSE are modified (either according to the Priority Dispatch file or on a *pro rata* basis in the absence of such a file) as follows:

(1) Generation dispatch levels for each LSE are modified as necessary to account for differences in the load contained in Seasonal Base Case Models and the Monthly Base Case Models, updated generation outage data, and changes in Net Interchange calculated pursuant to Section 5.3(d)(i)(2).

(2) When necessary to enforce zonal import limits, the Base Case Models may also be dispatched by specific zones rather than on an entire Control Area basis pursuant to Entergy's business practice for enforcing zonal import limits.

When a LSE does not have sufficient Network Resources or Secondary Network Service to meet its load and losses, Entergy dispatches uncommitted generating facilities that are deliverable within the Control Area (*i.e.,* generating facilities with NRIS) on a *pro rata* basis to meet the remainder.

Any Reservations in excess of the Customer's load will not be modeled in the Base Case Model. Per Section 5.3(c)(ii), the unmodeled portion of these requests will be algebraically decremented on the PMax and TieCap Flowgates. Expiration dates and rollover rights for Firm Network Resource Reservations will be handled in accordance with Section 5.2(i).

(b) Modeling Firm and Non-Firm PTP Service

(i) Operating Horizon: In the Operating Horizon, Firm PTP Service Reservations are modeled at the level at which service has been scheduled and Non-Firm PTP Service Reservations are modeled at their respective Reservation capacity levels, provided that no generating facility exceeds the maximum rating provided pursuant to Section 5.2(g). Where a grandfathered customer serves its load using grandfathered transmission service comparable to either PTP Service or a combination of grandfathered transmission service and PTP Service, the grandfathered service or PTP Service is treated as service to Network Load/ Entergy's Native Load Customers and is modeled in accordance with Section 5.3(a).

(ii) Planning Horizon: In the Planning Horizon, Firm PTP Service Reservations and Non-Firm PTP Service Reservations at their respective Reservation capacity levels, provided that no generating facility exceeds the maximum rating provided pursuant to Section 5.2(g). Where a grandfathered customer serves its load using grandfathered transmission service comparable to either PTP Service or a combination of grandfathered transmission service and PTP Service, the grandfathered service or PTP Service is treated as service to Network Load/ Entergy's Native Load Customers and is modeled in accordance with Section 5.3(a). As set forth in Section 5.1(c), the effects of Non-Firm PTP Service Reservations modeled in the Planning Horizon is removed to calculate Base Flow (Firm) and Firm AFC values.

(iii) Study Horizon: In the Study Horizon, Firm PTP Service Reservations and Non-Firm PTP Service Reservations are modeled at their respective Reservation capacity levels, provided that no generating facility exceeds the maximum rating provided pursuant to Section 5.2(g). Where a grandfathered customer serves its load using grandfathered transmission service comparable to either PTP Service or a combination of grandfathered transmission service and PTP Service, the grandfathered service or PTP Service is treated as service to Network Load/ Entergy's Native Load Customers and is modeled in accordance with Section 5.3(a). As set forth in Section 5.1(c), the effects of Non-Firm PTP Service Reservations modeled in the Study Horizon are removed to calculate Base Flow (Firm) and Firm AFC values.

(c) Existing Transmission Commitments Not Modeled in Base Flows

(i) TSRs: PTP TSRs and Network Resource TSRs that have a status of Accepted or Counteroffered are not modeled as discrete injections or withdrawals in Base Flows in the Operating, Planning, and Study Horizons. These TSRs are algebraically decremented against the PMax and TieCap Flowgates and the remaining Most Limiting Flowgates until such time as they are Withdrawn, Refused, or Confirmed. When an Accepted or Counteroffered TSR is Confirmed in between resynchronizations in the Operating and Planning Horizons, the TSR continues to be algebraically decremented against the PMax and TieCap Flowgates and the remaining Most Limiting Flowgates until such time as there is an RFCALC and webTrans resynchronization. When an Accepted or Counteroffered TSR is Confirmed in between resynchronizations in the Study Horizon, the TSR continues to be algebraically decremented against the PMax and TieCap Flowgates and the remaining Most Limiting Flowgates until such time as there is a recalculation of Base Flows through the off-line calculator tools and a webTrans resynchronization. If a TSR is Withdrawn, Refused, or otherwise becomes invalid in between resynchronizations in the Operating, Planning and Study Horizons, the TSR is no longer algebraically decremented against the PMax and TieCap Flowgates and the remaining Most Limiting Flowgates after the following resynchronization. TSRs that are in Study mode are algebraically decremented against the PMax and TieCap Flowgates and the remaining Most Limiting Flowgates in all horizons.

(ii) Reservations In Excess of Network Load and Native Load: Under the procedures for modeling of generation dispatch described in Section 5.3(a), there will be instances where certain Network Resource Reservations or grandfathered Reservations are not

modeled in the EMS-Based Models or Monthly Base Case Models. These Reservations are algebraically decremented on the PMax and TieCap Flowgates. For those Reservations that are partially dispatched in the EMS-Based or Monthly Base Case Models, the un-modeled impact of those Reservations is algebraically decremented against the PMax and TieCap Flowgates. In both instances described above, the impact of such Reservations is not algebraically decremented against the other Significantly Impacted Flowgates. This process is the same for the Operating, Planning and Study Horizons, except for PMax Flowgates in the Operating Horizon which are determined by using the MW output of each generating facility as computed by RFCALC.

(d) Net Interchange and External Control Areas

(i) Net Interchange

(1) Operating and Planning Horizons: Net Interchange for the Entergy's Control Area is computed by using all Reservations and Schedules that are modeled in accordance with Sections 5.3(a) and 5.3(b) to balance the loads and bilateral transactions with all Embedded Control Areas and First-Tier External Control Areas. RFCALC derives Net Interchange for larger First-Tier External Control Areas by taking actual, current Net Interchange information from the State Estimator and adjusting that value to forecast future Net Interchange values. For smaller First-Tier External Control Areas and Embedded Control Areas, the Net Interchange is computed by using the Reservations/Schedules available from the OASIS in the same manner as Net Interchange computations for Entergy's Control Area.

(2) Study Horizon: Net Interchange for the Entergy Control Area is computed by using all Reservations that are modeled to balance the loads and bilateral transactions with all Embedded Control Areas and First-Tier External Control Areas. The Net Interchange for External Control Areas is derived: (1) from the SERC regional models and Seasonal Base Case Models for the Interchange between that External Control Area and any other adjacent External Control Area; and (2) from Reservations taken from the Entergy OASIS for the Interchange between the Entergy Control Area and that External Control Area. All Reservations between the Entergy Control Area and the First-Tier External Control Areas are modeled in accordance with Sections 5.3(a)-(c). Any base transactions

that exist in the SERC regional models and Seasonal Base Case Models between the Entergy Control Area and First-Tier External Control Areas or Embedded Control Areas are updated to reflect Reservations taken from OASIS.

(ii) External Control Areas

(1) Operating and Planning Horizons:

The EMS-Based Models contain a detailed representation of certain External Control Areas and all other External Control Areas are equivalenced (*i.e.*, are modeled at less than full detail). Transmission system topology for External Control Areas is derived from the EMS-Based Model and is updated each business day to reflect transmission facility outages for External Control Areas based on NERC SDX outage data provided by those Control Areas. Only outages on facilities that are contained in the EMS-Based Models can be modeled in the Operating and Planning Horizons.

If a transmission outage from another Transmission Service Provider has an impact on Entergy transmission system reliability, Entergy includes that outage in the Transmission model used to calculate Flowgate capability.

If a transmission outage from another Transmission Service Provider that has an impact on Entergy transmission system reliability cannot be mapped to the model, Entergy will model the outage as an outage of an equivalent element in the model that would have a similar impact.

In the absence of generation dispatch data for equivalenced External Control Areas, RFCALC initializes generating facilities at the level specified by the State Estimator. After modeling Reservations for each equivalenced External Control Area, RFCALC adjusts the dispatch of AGC Facilities in that Control Area to balance the load and Net Interchange. The adjustment is implemented on a modified *pro rata* basis, so that all AGC Facilities reach their rated maximum or minimum limits simultaneously.

For non-equivalenced External Control Areas, RFCALC initializes generating facilities at their minimum output level and then dispatches these facilities based on the generation dispatch data provided by the Control Area Operator (or Reservations if needed). If the Control Area

load and Net Interchange is not balanced, RFCALC adjusts the dispatch of AGC Facilities in that Control Area to balance the load and Net Interchange. The adjustment is implemented on a modified *pro rata* basis, such that all AGC Facilities reach their rated maximum or minimum limits simultaneously.

Note on generation outages:

Entergy downloads the external area generator outages from the NERC SDX and models those which have an impact on Entergy system reliability. These outages are updated once a day each business day.

If notified of a generation outage by the ICT or an external Transmission Service Provider, Entergy includes that outage in the Transmission model used to calculate Flowgate capability.

If a requested generator outage cannot be mapped to the model, Entergy will model the outage as an outage of an equivalent generator in the model that would have a similar impact.

a. The entities that provide data to Entergy for this modeling are listed in section Section 6.1.

(2) Study Horizon:

In the Monthly Base Case Models, External Control Areas are modeled at the level of detail contained in the NERC/SERC regional models and Seasonal Base Case Models developed pursuant to the modeling and updating processes described in Section 15 of Attachment C and Attachment D to the Tariff. These models incorporate the system topology, facility ratings, generation dispatch, load forecasts, Net Interchange, and transmission uses provided by External Control Areas that participate in the SERC modeling process. Data for the Southern Company and TVA Control Areas are further updated on a monthly basis in coordination with those entities as described in Section 15 herein.

In addition to the updates mentioned above, the Entergy updates First-Tier External Control Area information in the Monthly Base Case Models as follows: (1) Net Interchange between the Entergy Control Area and First-Tier External Control Areas is updated with data from OASIS as per

Section 5.3(d)(i)(2); (2) generating facilities that are located in First-Tier External Control Areas and have generator-specific Response Factors are committed and dispatched in accordance with the Reservations sourced from each facility; and (3) if a First-Tier External Control Area operator provides a preferred priority stack dispatch for that Control Area, the generating facilities included in the priority stack dispatch file are committed and dispatched in the order provided. After modeling the generating facilities as described above, or in the absence of the External Control Area Operator providing the data referenced in (3) above, all generating facilities in the First-Tier External Control Area not declared to be out of service by the External Control Area are scaled on a modified *pro rata* basis (so that all generating facilities reach their rated maximum or minimum limits simultaneously) to account for any remaining imbalance between generation and load plus losses.

The model contains all elements that have an impact on the system.

Any transmission or generation outages from other Transmission Service Providers not mapped to the Transmission model used to calculate Flowgate capability are not included in the model and therefore not addressed in Flowgate capability calculations.

a. The entities that provide data to Entergy for this modeling are listed in Section 6.1.

(3) External Flowgate AFC: For the external Flowgates identified pursuant to MOD-030-2 Requirement R2.1.4, Entergy uses the AFC provided by the Transmission Service Provider that calculates AFC for that Flowgate.

Upon getting a request from an adjacent BA, Entergy will add the external flowgate in RFCALC, webTrans and Powergem PAAC. The mapname for the flowgate will have to be agreed upon in the agreement with neighbors. The Flowgates will be set as reciprocal flowgates in webTrans. For reciprocal flowgates, webTrans will expect an AFC over-ride from the neighbor. If the AFC over-ride is not available, Entergy will use the values calculated by Entergy's AFC system. Entergy will use the data provided in the AFC override as is, without performing any validation on the values. TSRs submitted before the time

when the AFC override is provided is expected to be included in the AFC value. TSRs submitted after the AFC override update will be applied to the flowgate, if applicable, using TDFs computed in RFCALC and Powergem.

5.4 Accounting for Counterflows: Entergy accounts for counterflows in the following manner:

(a) The manner in which confirmed Transmission reservations and expected Interchange are addressed in firm and non-firm AFC calculations is explained in Section 5.1(b)-(c) (containing the formulas for calculating firm and non-firm AFC) and Section 5.1(d) (describing how Entergy calculates the impact of ETC for firm and non-firm commitments). The manner in which internal counterflow is addressed in firm and non-firm AFC calculations is addressed as follows:

(i) Operating and Planning Horizons: The counterflow percentage utilized in the Operating Horizon and Planning Horizons is at 100% (0% removal from the baseflow).

100% is used for the Operating Horizon because it is based on Firm Schedules and Non-Firm Reservations.

The decisions to use 100% counterflow in the Planning Horizon was an accommodation to stakeholders to address concerns raised in the Entergy AFC stakeholder process.

(ii) Study Horizon:

Entergy, in conjunction with the ICT, reviews scheduling data and other operational experience to determine counterflow percentages and evaluates the reasonableness of the established counterflow percentages through a biennial review. The methodology utilized during this biennial review to determine the percentage of counterflow includes (1) a comparison of reservations to schedules and (2) a determination of the percent of reservations that are scheduled. This comparison and percentage calculation will be as shown below in support of the current counterflow percentage for the Study Horizon.

Reservations included in this analysis will be all Reservations from the previous year that impact the Hour Ending 1600, excluding Reservations that do not require scheduling (such as Network Service) from native generation used to serve the Customer's own load. Firm Redirects and Resales are included in the Reservations, but their impact is removed from the parent Reservations to ensure accuracy. All schedules from the previous year are then cross-

referenced to determine the Megawatt Hours (MWhs) scheduled for each Reservation. The results of the Reservation query and the cross-referencing of the previous year's schedules are then organized by type of service (Network vs. PTP), Class (Firm, Non-Firm), and service increments (hourly, daily, weekly, monthly, and yearly) as depicted above. The results are then analyzed to determine the percentage of counterflows by comparing the percentage of MW scheduled for Firm PTP Service and Non-Firm PTP Service by service increment and setting the counterflow percentage accordingly.

The Study Horizon is primarily comprised of Firm monthly and yearly reservations; therefore, only the data for monthly PTP and yearly PTP reservations will be used to set the PTP counterflow percentage for the Study Horizon. In accordance with the data presented below, counterflows for Firm PTP reservations in the Study Horizon will be set at 63% (37% removal from the baseflow). The percentage was calculated by dividing the aggregate Firm monthly and yearly PTP capacity scheduled by the aggregate Firm monthly and yearly MW reserved. This data will be updated in accordance with Section 8 of Attachment C.

Study Horizon			
Firm Point to Point	**MW Reserved**	**Capacity Scheduled**	**% Scheduled**
MONTHLY	493,145	343,614	70%
YEARLY	535,191	302,033	56%
TOTAL	**1,028,336**	**645,647**	**63%**

5.5 Accounting for Sources and Sinks for Transmission Service: In AFC calculations, Entergy accounts for sources and sinks for transmission service as follows:

(a) Source Field: Entergy obtains the source used for AFC calculations from the source field of the transmission reservation.

(b) Sink Field: Entergy obtains the sink used for AFC calculations from the sink field of the transmission reservation.

(c) Source/Sink or POR/POD Identification and Mapping to the Model; Grouping of Generators in AFC Calculation; Representing the Impact of Transmission Service

(i) The documents incorporated by reference below contain the information regarding how the source and sink for transmission service is accounted for in AFC calculations. This includes:

(1) The identification of sources/sinks or POR/PODs and their mapping to the model.

a. The source/sink identification and mapping to the model is described in the table located at the following links.

The files for the operating and planning horizons are located here:

http://www.oasis.oati.com/EES/EESDocs/SourceSinkIDandMapping-OperPlan.csv

The files for the study horizon are located here:

http://www.oasis.oati.com/EES/EESDocs/study_master.sub.txt

(2) How generators participate in a grouping of generators in Entergy's AFC calculation process.

a. The participation factor calculation methodology for the grouping of generators in Entergy's AFC calculation process is described in detail in Section VIII(10) and Attachments 4 and 5 of the Entergy Business Practices posted on the Entergy OASIS.

(ii) Entergy represents the impact of Transmission Service when calculating AFCs according to the rules described in MOD-030-02 R4.

a. Point 1: If the source, as specified in the ATCID, has been identified in the reservation and is discretely modeled in the Entergy model, Entergy uses the discretely modeled point as the source.

b. Point 2: If the source, as specified in the ATCID, has been identified in the reservation and the point can be mapped to an "equivalence" or "aggregate" representation in the Entergy model, Entergy uses the modeled equivalence or aggregate as the source.

c. Point 3: All of the sources identified in the ATCID are either discretely mapped to generators or are represented as aggregations of generators, or mapped to an adjacent Balancing Authority if needed.

d. Point 4: Under Att. M of the Entergy OATT, the source must be specified, therefore this situation would not arise.

e. Point 5: If the sink, as specified in the ATCID, has been identified in the reservation and it is discretely modeled in Entergy's model, Entergy uses the discretely modeled point as the sink.

f. Point 6: If the sink, as specified in the ATCID, has been identified in the reservation and the point can be mapped to an "equivalence" or "aggregate" representation in Entergy's model, Entergy uses the modeled equivalence or aggregate as the sink.

g. Point 7: All of the sinks identified in the ATCID are either discretely mapped to loads or are represented as aggregations of loads, or mapped to an adjacent Balancing Authority if needed.

h. Point 8: Under Att. M of the Entergy OATT, the sink must be specified, therefore this situation would not arise.

6. ATC Data Exchanges

6.1 Entities Providing Data to Entergy: The list of Transmission Operators and Transmission Service Providers from which Entergy receives data for use in calculating AFC is available at:

http://www.oasis.oati.com/EES/EESDocs/ListofTOPsandTSPsfromwhichEntergyReceivesAFCCalculationData.pdf

6.2 Entities to Which Entergy Provides Data: The list of Transmission Service Providers and Transmission Operators to which Entergy provides data for use in calculating transfer or Flowgate capability is available at:

http://www.oasis.oati.com/EES/EESDocs/ListofTOPsandTSPstowhichEntergyProvidersTransferorFlowgateCalculationData.pdf

(a) Provision of Data Pursuant to MOD-001-1a R9: Within thirty calendar days of receiving a request by any Transmission Service Provider, Planning Coordinator, Reliability Coordinator, or Transmission Operator for the data listed in MOD-001-1a R9 for use in the requestor's ATC or AFC calculations, Entergy will begin to make the requested data available to the requestor, subject to the conditions specified in MOD-001-1a R9.1 and R9.2. The instructions for any Transmission Service Provider,

Planning Coordinator, Reliability Coordinator, or Transmission Operator requesting this data are available at:

http://www.oasis.oati.com/EES/EESDocs/AFCInformationRequests.pdf

7. Allocation Processes

7.1 Of the allocation processes listed under MOD-001-1a Requirement 3.5, the following are applicable to Entergy:

(a) Processes used to allocate transfer or Flowgate capabilities among multiple owners or users of an ATC Path or Flowgate.

(i) The New Madrid to Dell 500 kV transmission line is a co-owned facility between Entergy, AECI, and AMRN in which each party owns one-third of the facility (500 MW each). The full amount of Entergy's ownership can be used by the AMRN or AECI interface flowgates on a first-come first-served basis.

7.2 Entergy does not use the following allocation processes listed under MOD-001-1a Requirement R3.5:

(a) Processes used to allocate transfer or Flowgate capability among multiple lines or sub-paths within a larger ATC Path or Flowgate.

(b) Processes used to allocate transfer or Flowgate capabilities between Transmission Service Providers to address issues such as forward looking congestion management and seams coordination.

8. Hourly, Daily, and Monthly AFC Values: Entergy calculates AFC values using the Flowgate Methodology as described in MOD-030-02 for those Facilities within its Transmission Service Provider area for the following time periods:

8.1 Hourly values for at least the next 48 hours.

(a) Operating Horizon: In the Operating Horizon, Non-Firm AFC values for each Flowgate are calculated by webTrans, which uses Response Factors and Base Flows calculated by RFCALC. webTrans calculates Non-Firm AFC values for all hours of Day 1 and, after 12:00 p.m., all hours of Day 2. Firm AFC values are not calculated for the Operating Horizon because TSRs for Network Resources and Firm PTP Service must be submitted by 12:00 p.m. on the day prior to commencement of such service.

8.2 Daily values for at least the next 31 calendar days.

(a) Planning Horizon: In the Planning Horizon, Firm and Non-Firm AFC values for each Flowgate are calculated by webTrans, which uses Response Factors and Base Flows calculated by RFCALC. webTrans

calculates hourly Firm and Non-Firm AFC values for Day 2 through Day 7 and daily Firm and Non-Firm AFC values for Day 8 to Day 31.

(b) Entergy calculates the daily values for Day 32 through Day 33 based on the monthly models.

8.3 Monthly values for at least the next 12 months (months 2-13).

(a) Study Horizon: In the Study Horizon, the ICT, using data inputs and Base Case Models developed (or collected) by Entergy, calculates monthly Response Factors and Base Flows by conducting off-line power flow studies. The Base Case Models are developed on a rolling (at least) eighteen-month basis and are representative of monthly peak-hour conditions. Firm and Non-Firm AFC values for each Flowgate are calculated for the peak hour of each month from Month 2 to Month 18.

9. Frequency for Recalculation of AFC: Entergy recalculates AFC utilizing the updated models described in the ATCID continually for hourly, daily, and monthly AFC whenever any of the calculated values identified in the AFC equation have changed.

9.1 As a result, AFC is recalculated at a minimum on the following frequency, unless none of the calculated values identified in the AFC equation have changed.

(a) Hourly AFC: For hourly AFC, once per hour.

(i) However, Entergy is allowed up to 175 hours per calendar year during which calculations are not required to be performed, despite a change in a calculated value identified in the AFC equation.

(b) Daily AFC: For daily AFC, once per day.

(c) Monthly AFC: For monthly AFC, once per week.

10. Resynchronization of AFC Values

10.1 AFC values are resynchronized every hour during the Operating Horizon, at least every day during the Planning Horizon, and no less than every month during the Study Horizon. Resynchronizations may occur more frequently if necessary. To the extent Entergy agrees to more frequent resynchronizations on a regular basis, the TSR Business Practices will describe the basis for that frequency. The ICT may also direct resynchronizations of AFC values pursuant to Section 8.3 of the Transmission Service Protocol. Resynchronization may be delayed in certain circumstances, including but not limited to, allowing for the archiving of data associated with the prior resynchronization. To the extent that webTrans cannot compute a scheduled resynchronization, the last valid webTrans resynchronization is used to post AFC values and to evaluate TSRs.

10.2 During the resynchronization process, the AFC Software incorporates updated data inputs to develop EMS-Based Models and Monthly Base Case Models that define each time point included in the Operating, Planning and Study Horizons. The updated data inputs are used to calculate new AFC values in accordance with the formulas described in Sections 5.1(b) and 5.1(c). When a new TSR is in Study, Accepted, or Counteroffered status between resynchronizations, or a Reservation is Confirmed between resynchronizations, the AFC values for the Most Limiting Flowgates are updated in webTrans by algebraically decrementing the impact of the new transactions as described in Section 5.3(c)(i). At the time of the next resynchronization, the Operating, Planning and Study Horizons are updated so that new Reservations are modeled as physical injections and withdrawals (rather than by algebraic decrementing) as described in Section 5.3.

11. Calculation of ATC

11.1 Conversion of AFC to ATC: When converting Flowgate AFCs to ATCs for ATC Paths, Entergy shall convert those values based on the following algorithm:

$$ATC = \min(P)$$

$$P = \{PATC_1, PATC_2, \ldots PATC_n\}$$

$$PATC_n = \frac{AFC_n}{DF_{np}}$$

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 the percentage[2] used to curtail in the Interconnection-wide congestion management procedure used by the Transmission Service Provider on an OTDF Flowgate or PTDF Flowgate.

$PATC_n$ is the partial Available Transfer Capability for a path relative to a Flowgate *n*.

AFC_n is the Available Flowgate Capability of a Flowgate *n*.

DF_{np} is the distribution factor for Flowgate *n* relative to path *p*.

[2] A percentage less than that used in the Interconnection-wide congestion management procedure may be utilized.

Tables of Changes

Date of Revision	Sections Affected	Reason for Change
April 1, 2011	All	Initial Posting of ATCID
April 1, 2011 (afternoon)	5.1(d)(iv) and (vi); 5.1(e)(ii), (iv), and (vi)	Revisions to clarify the modeling of the impact of ETC for certain firm and non-firm commitments
April 4, 2011	5.5(c)(i)(1) and (2); 6.2(a)	Revisions to links embedded in ATCID and cross-references to Entergy Business Practices
April 7, 2011	6.1 and 6.2	Revisions to links embedded in ATCID
September 26, 2011	1.2; 5.1(a)(i); 5.2(h)(i); 5.3(d)(ii)(1); various	Clarifications to list of Reliability Standard Requirements addressed by ATCID; expanded explanation of the modeling of external control area outages; changes to cross-references from MOD-001-1 to MOD-001-1a; clarifications to references to software packages used in calculating AFC
September 27, 2012	5.2(e)(iii); 5.5(c)(i)(1)(a); 6.1; 6.2; 6.2(a)	Changes to embedded hyperlinks
October 8, 2012	5.4(a)(ii); 5.2(h)(ii)	Updated counterflow percentages for Study Horizon Firm PTP; clarified modeling of outages in Study Horizon
August 15, 2013	3.7(b)(iv); 5.2(c); 5.2(d)(i); 5.2(e)(i); 5.3(a)(i)(4); 5.3(a)(ii); 10.2	Changes to align with Attachment C changes per FERC's May 16, 2013 Order