

# **NERC ATC Standards MOD Review**

June 14, 2010



# NERC ATC MODs

- MOD-001: Available Transmission System Capability - Requires the selection of an ATC Methodology and describes the parts of the ATC process that apply to all entities, regardless of methodology chosen.
  - <http://www.nerc.com/files/MOD-001-0.pdf>
- MOD-004: Capacity Benefit Margin (CBM) Methodology - Describes the reliability aspects of determining and maintaining a CBM and what components may be considered when making that determination (BPA does not currently use CBM).
  - <http://www.nerc.com/files/MOD-004-0.pdf>
- MOD-008: Transmission Reliability Margin (TRM) Methodology - Describes the reliability aspects of determining and maintaining a TRM and what components of uncertainty may be considered when making that determination (BPA uses TRM on some of its paths but not all).
  - <http://www.nerc.com/files/MOD-008-0.pdf>
- MOD-028: Area Interchange Methodology - Describes Area Interchange Methodology for determining ATC (BPA will not be using MOD-028).
  - <http://www.nerc.com/files/MOD-028-1.pdf>
- MOD-029: Rated System Path Methodology - Describes Rated System Path Methodology for determining ATC (BPA will use MOD-029 for its interties and external interconnections).
  - <http://www.nerc.com/files/MOD-029-1.pdf>
- MOD-030: Flowgate Methodology- Describes Flowgate Methodology for determining AFC (BPA will use MOD-30 for its internal Flowgates)
  - <http://www.nerc.com/files/MOD-030-2.pdf>



## MOD-001: Available Transmission System Capability

- Select one of three prescribed ATC Methodologies (MOD-028, MOD-029, or MOD-030) for each ATC Path.
  - ATC Path: any POR/POD combination where ATC is calculated and any posted path.
  - Posted path: any Balancing Authority (BA) Interconnection, any path for which service is denied, curtailed, or interrupted for more than 24 hours in the past 12 months; and any path for which a customer requests to have ATC or TTC posted.
- Calculate ATC/AFC:
  - Hourly values for at least the next 48 hours.
  - Daily values for at least the next 31 calendar days.
  - Monthly values for months 2-13.



## MOD-001: Methodology Guidelines

- Prepare an ATC Implementation Document (ATCID) that includes at a minimum:
  - Information describing how the selected methodology has been implemented, in such detail, that given the same information, the ATC/AFC results can be validated.
  - Description of counterflows and the rationale for that accounting.
  - Identity of entities that the TSP is receiving data from or providing data to for ATC/AFC calculations.
  - Description of allocation processes.
  - Description of how generation and transmission outages are considered in transfer or Flowgate capability calculations.
- Recalculate ATC/AFC:
  - Hourly values, once per hour.
  - Daily values, once per day.
  - Monthly values, once per week.
- Provide certain data elements to any Transmission Service Provider, Reliability Coordinator, Planning Coordinator, or Transmission Operator within 30 days if requested.



## MOD-004: Capacity Benefit Margin

- Prepare a CBM Implementation Document that includes at a minimum:
  - The process through which a Load-Serving Entity (LSE) or Resource Planner (RP) with the Balancing Authority (BA) may ensure that its need for Tx capacity set aside as CBM will be reviewed and accommodated by the TSP to the extent capacity is available.
  - The procedures and assumptions for establishing CBM
  - The procedure for an LSE or BA to use Tx capacity set aside as CBM, including how the TSP will manage situations where the requested use of CBM exceeds the amount of CBM available.
- The LSE or RP will determine its need for capacity set aside as CBM for imports into a BA by:
  - Loss of Load Expectation (LOLE) studies
  - Loss of Load Probability (LOLP) studies
  - Deterministic risk-analysis studies
  - Reserve margin or resource adequacy requirements established by other entities, such as municipalities, state commissions, regional transmission organizations, independent system operators, Regional Reliability Organizations, or regional entities.
- Establish CBM values at least every 13 months. The value must reflect:
  - Any studies performed by LSEs or RPs for loads within the TSP's area
  - Any reserve margin or resource adequacy requirements for loads within the TSP's area
- CBM values must be allocated based on the expected import paths or source regions provided by LSEs or RPs and the distribution factors associated with those paths or regions (if applicable), as determined by the TSP.



## MOD-004: Capacity Benefit Margin (cont.)

- Establish CBM values at least every 13 months. The value must reflect:
  - Any studies performed by LSEs or RPs for loads within the TSP's area
  - Any reserve margin or resource adequacy requirements for loads within the TSP's area
- CBM values must be allocated based on the expected import paths or source regions provided by LSEs or RPs and the distribution factors associated with those paths or regions (if applicable), as determined by the TSP.
- The TSP shall notify all LSEs and RP that determined they had a need for CBM on the TSP's system of the amount of CBM set aside less than 31 calendar days after the establishment of CBM.
- The LSE or BA shall request to import energy over firm Transfer Capability set aside as CBM only when experiencing a declared NERC Energy Emergency Alert (EEA) 2 or higher.
- All BAs and TSPs shall waive, within the bounds of reliable operation, any Real-time timing and ramping requirements when reviewing an Arranged Interchange using CBM.
- The TSP shall approve, within bounds of reliable operation, any Arranged Interchange using CBM that is submitted by an "energy deficient entity" under an EEA 2 if:
  - CBM is available, and
  - The EEA 2 is declared within the BA Area of the "energy deficient entity," and
  - The Load of the "energy deficient entity" is located within the TSP's area.



## MOD-008: Transmission Reliability Margin

- Prepare a TRM Implementation Document that includes at a minimum:
  - Identification of each of the following components of uncertainty used in TRM:
    - Aggregate load forecast & load distribution uncertainty
    - Forecast uncertainty in transmission system topology
    - Allowances for parallel path (loop flow) impacts and simultaneous path interactions.
    - Operating Reserve actions, reserve sharing requirements, and inertial response and frequency bias.
  - Description of method used to allocate TRM across Paths and Flowgates
  - Identification of the TRM calculation for each time period.



## MOD-029: Rated System Path Methodology

- Follow the prescribed process for calculating TTC and establish TTC at the lesser of the value calculated by using that process or any System Operating Limit.
- Calculate firm Existing Transmission Commitments (ETC) using the following algorithm:
  - Firm ETC = Native Load (NL) + firm NT + firm Grandfathered (GF) + firm PTP + rollover rights + firm Other Services (OS)
- Calculate non-firm ETC using the following algorithm:
  - Non-firm ETC = non-firm NT + non-firm GF + non-firm PTP + non-firm OS
- Calculate firm ATC using the following algorithm:
  - Firm ATC = TTC – firm ETC – CBM – TRM + Postbacks + counterflows
- Calculate non-firm ATC using the following algorithm:
  - Non-Firm ATC = TTC – firm ETC – non-firm ETC – scheduled CBM – unreleased TRM + Postbacks + counterflows



## MOD-30: Flowgate Methodology

- Include in the ATCID:
  - Criteria to identify sets of Transmission Facilities as Flowgates to be considered in AFC calculations.
  - Information on how source and sink for transmission service is accounted for in AFC calculations.
- Establish list of Flowgates at least once per year.
- Establish TFC as equal to:
  - For thermal limits, the System Operating Limit of the Flowgate
  - For voltage or stability limits, the flow that will respect the SOL of the Flowgate



## MOD-030: Criteria for Calculating AFC

- To calculate AFC, use a Transmission model that:
  - Contains generation Facility Ratings and modeling data & system topology for the Facilities within its Reliability Coordinator's Area and for immediately adjacent & beyond Reliability Coordination Areas.
  - Is updated at least once per day for hourly & daily AFC calculations
  - Is updated at least once per month for monthly AFC calculations.
  - Includes expected generation & transmission outages, additions, and retirements within the scope of the model.
- When calculating AFCs, represent the impact of transmission service as follows:
  - If the source/sink has been identified in the reservation and it is discretely modeled in the Tx model, use the discretely modeled point
  - If the source/sink has been identified in the reservation and the point can be mapped to the "equivalence" or "aggregate" representation in the Tx model, use the modeled equivalence or aggregate
  - If the source/sink has been identified in the reservation and the point cannot be mapped to the Tx model, use the immediately adjacent Balancing Authority from which the power is received as the source or is receiving the power as the sink.



## MOD-030: Calculation of Firm ETC and AFC

- Calculate firm ETC by summing the following:
  - Impact of NT, including impacts of generation to load in the model for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10% based on:
    - Load forecast for the time period being calculated
    - Unit commitment & Dispatch Order, to include all designated network resources
  - Impact of confirmed firm PTP expected to be scheduled, including roll-over rights for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10% .
  - Impact of any Grandfathered firm obligations expected to be scheduled for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10%.
  - Impact of other firm services determined by the TSP.
- Firm AFC = TFC – firm ETC – CBM – TRM + Postbacks + counterflows



## MOD-030: Calculation of Non-firm ETC and AFC

- Calculate non-firm ETC by summing the following:
  - Impact of non-firm PTP expected to be scheduled for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10%.
  - Impact of any Grandfathered non-firm obligations expected to be scheduled for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10%.
  - Impact of non-firm NT (secondary NT) serving Load for the TSP's area and for all adjacent TSP areas that have a distribution factor of equal to or greater than 10%.
  - Impact of other non-firm services determined by the TSP.
- Non-firm AFC = TFC – firm ETC – non-firm ETC – scheduled CBM – unreleased TRM + Postbacks + counterflows

