

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

Information Requirements for  
Available Transfer Capability

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Docket No. RM05-17-000

**COMMENTS OF THE  
NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL  
TO NOTICE OF INQUIRY**

The North American Electric Reliability Council, a New Jersey nonprofit corporation (“NERC”)<sup>1</sup>, is pleased to provide these comments in response to the issues and questions raised in the Commission’s May 27, 2005 Notice of Inquiry, “Information Requirements for Available Transfer Capability.”

NERC supports the Commission in encouraging the electric industry to work toward increased communication, coordination, consistency, and transparency in the calculation of Available Transfer Capability (“ATC”) and related ATC values. As part of the notice of inquiry, the Commission seeks comment on a report on ATC matters issued by NERC’s Long-Term AFC/ATC Task Force (the “LTATF report”).<sup>2</sup> These comments are divided into three parts:

- Background

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<sup>1</sup> NERC was formed after the Northeast blackout in 1965 to promote the reliability of the interconnected electric systems in North America. Its mission is to ensure that the bulk electric systems that serve North America are adequate, reliable, and secure. It works with all segments of the electric industry as well as customers to “keep the lights on” by developing and encouraging compliance with rules for the reliable operation and adequacy of supply of these systems. NERC comprises ten regional Reliability Councils that account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

<sup>2</sup> [ftp://www.nerc.com/pub/sys/all\\_updl/mc/ltatf/LTATF\\_Final\\_Report\\_Revised.pdf](ftp://www.nerc.com/pub/sys/all_updl/mc/ltatf/LTATF_Final_Report_Revised.pdf) (the LTATF report was first issued in March 2005 and was revised in April 2005).

- NERC's position and activities
- Responses to the Commission's specific questions

### **Background**

After FERC issued Orders No. 888 and 889, the electric utility industry, and specifically, the transmission service providers within the industry, established procedures, communication protocols, and extensive computer and analytic tools to forecast the unused, and therefore available, transmission transfer capability for the next 168 hours, 30 days, and 13 months, as mandated in the Commission orders. As inherent in any forecast, future events and conditions are not certain, and as such the forecast of ATC is not perfect, despite the sophistication of the calculation methodology or the organization performing the calculation.

NERC has had standards on ATC, Total Transfer Capability (TTC), Capacity Benefit Margin (CBM), and Transmission Reliability Margin (TRM) since September 1997. The NERC Board of Trustees approved modified standards in February 2002. Those standards then were converted during the NERC Version 0 standards process into NERC's current ATC and TTC standards (Reliability Standards MOD-001-0, MOD-002-0, and MOD-003-0), CBM standards (Reliability Standards MOD-004-0, MOD-005-0, MOD-006-0, and MOD-007-0), and TRM standards (Reliability Standards MOD-008-0 and MOD-009-0), which became effective April 1, 2005. These NERC ATC, TTC, CBM, and TRM standards, which have been filed with the Commission for purposes of information, include a number of specific requirements that the members of each regional reliability council must adhere to in their regional methodologies for the determination of ATC, TTC, CBM, and TRM values.

### **NERC position and activities**

NERC agrees that there is a need to continue the enhancement of the calculation of ATC and ATC-related values to support the wholesale generation market while maintaining adequate reliability for all users of the bulk electric systems. NERC supports the efforts of LTATF, the Commission, and the industry to add increased standardization and consistency to the current NERC reliability standards on ATC, TTC, CBM, and TRM. NERC agrees that certain changes to its ATC, TTC, CBM, and TRM standards are needed, but urges caution with a constant eye on reliable operation. It is, therefore, critical that ATC calculations and related ATC values be consistent with NERC standards, regional criteria, the transmission owner's operating and planning criteria, and Orders No. 888 and 889. The transmission owner's operating and planning criteria used for ATC calculations should also be consistent with the criteria the transmission operator includes in its FERC 715 filing.

Consistent with the general direction outlined in the LTATF report, the LTATF recently submitted two standard authorization requests ("SARs"<sup>3</sup>) to the NERC reliability standards process proposing revisions to NERC's ATC and related standards. NERC also believes that aspects of requesting transmission service, the evaluation of a transmission service against the calculated ATC, TTC, and AFC values, and the communication of the resulting service to the transmission user are possible areas to be considered in business practice standards. To that end, the LTATF proposed such a business practice standard<sup>4</sup>

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<sup>3</sup> <http://www.nerc.com/~filez/standards/MOD-V0-Revision.html>

<sup>4</sup> <http://www.naesb.org/pdf2/r05004.doc>

to the North American Energy Standards Board (NAESB) in March 2005 to enhance the processing of transmission service requests.<sup>5</sup>

These three proposed standards have provided the impetus to make additions and refinements to increase communication, coordination, and consistency in the calculation of ATC and related values. These proposals and their development and acceptance by industry stakeholders through the NERC and NAESB standard processes, respectively, are major steps that should be pursued to improve ATC and related reliability standards and business practices.<sup>6</sup> The results of these efforts should help to promote greater market transparency for ATC and related values while maintaining adequate reliability of the bulk electric systems.

The two SARs proposing revisions to NERC's ATC and related standards were posted for industry comment over the July 8 to August 8, 2005 period. The comments will be reviewed by a SAR drafting team, which, based on the industry comments, will prepare a recommendation to the NERC Standards Authorization Committee ("SAC") on the scope of the effort to be followed in developing revisions to the NERC ATC, TTC, CBM, and TRM standards. Nominations of subject matter experts are being solicited through August 19, 2005 to populate the SAR drafting team, the members of which will be appointed by the NERC SAC. The proposed SARs are major steps in achieving the coordination and consistency sought and should be pursued under NERC's reliability standards process.

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<sup>5</sup> In developing these business practices, care must be taken to ensure that the tools or equipment to implement the business process flow not be specified, only the process flow. Further, all aspects dealing with reliability must be handled by NERC.

<sup>6</sup> Both NERC and NAESB have open industry processes that have been accredited by the American National Standards Institute for developing standards.

NERC recognizes that ATC evaluation has significant reliability implications, and has attempted to develop standards that would minimize adverse impacts upon reliability. For example, regional ATC methodologies are influenced by the different regional characteristics and limitations, such as voltage, thermal, fault level, stability, multiple contingencies, various generation dispatches, and other parameters that are particular to each region. Although ATC calculation techniques may be the same, assumptions used and contingencies analyzed may differ based on the applicable planning or operating criteria. In spite of significant consolidation of transmission service provider calculations, the different reliability issues of each region have prevented the achievement of the apparent industry uniformity desired by the transmission services market.

Whatever changes may be made to the NERC standards, it is of paramount importance that unacceptable reliability impacts not be allowed to become an unintended consequence of the goal of increased industry uniformity in the calculation of ATC, TTC, CBM, and TRM. NERC emphasizes that ATC values are not reliability indicators, but rather that ATC values are derived from reliability-based standards and the physical characteristics and limitations of the electric system. The ATC values represent the transmission transfer capability that can be utilized by the market while still maintaining reliability.

In addition, NERC has implemented a comprehensive compliance review and enforcement program in connection with its recent Version 0 conversion of its reliability standards. As a further aid in achieving increased communication, coordination, consistency, and transparency, NERC will include reviews of the regional reliability

organizations, transmission service providers, and other entities for compliance with the ATC, TTC, CBM, and TRM standards (Reliability Standards MOD-001-0 through MOD-009-0) will be included in its 2006 compliance enforcement program and such reviews will likely continue annually thereafter.

The NERC Planning Committee is generally supportive of further standardization and consistency in a number of key elements and parameters in the coordination and calculation of ATC, AFC, TTC, CBM, and TRM and has commented on the two proposed SARs during the recent public posting and comment period. NERC believes that the use of its Reliability Standards Process is an efficient and effective means of capturing industry consensus in strengthening its existing ATC, TTC, CBM, and TRM standards for increased coordination and consistency. Increased coordination and consistency in the calculation of ATC, TTC, CBM, and TRM values will continue to promote greater transparency of these parameters in the electricity market.

### **Specific Comments**

NERC offers the following comments in response to the Commission's request for industry comments on: (a) the definitions of AFC, ATC, CBM and TRM used in the notice of inquiry; (b) the advisability of revising and standardizing AFC, ATC, TRM and CBM values; (c) the advisability of developing interconnection-wide standards for the Eastern Interconnection and the WECC; (d) the contents of the LTATF Report; and (e) the most expeditious way to obtain industry-wide standards for ATC calculations.

**(a) The definitions of AFC, ATC, CBM and TRM used in the notice of inquiry**

In response to Orders No. 888 and 889, NERC developed and the industry, working through NERC, adopted standard definitions for Available Transfer Capability (ATC), Total Transfer Capability (TTC), Capacity Benefit Margin (CBM), and Transmission Reliability Margin (TRM). These definitions were included in the June 1996 NERC definitions and reference document, "Available Transfer Capability Definitions and Determination."

These definitions were included in the initial NERC Planning Standards of September 1997, and were reviewed and slightly altered as part of the expanded NERC Planning Standard development effort that culminated in the February 2002 NERC ATC, TTC, CBM, and TRM standards. The definitions for these terms, were further reviewed by industry, per the NERC Version 0 standards conversion effort, and resulted in the current NERC ATC and TTC standards (Reliability Standards MOD-001-0 through MOD-003-0), the CBM standards (Reliability Standards MOD-004-0 through MOD-007-0), and the TRM standards (Reliability Standards MOD-008-0 and MOD-009-0) These current definitions are as follows:

**Available Transfer Capability (ATC):** A measure of the transfer capability remaining in the physical transmission network for further commercial activity over and above already committed uses. It is defined as Total Transfer Capability less existing transmission commitments (including retail customer service), less a Capacity Benefit Margin, less a Transmission Reliability Margin.

**Total Transfer Capability (TTC):** The amount of electric power that can be moved or transferred reliably from one area to another area of the interconnected transmission systems by way of all transmission lines (or paths) between those areas under specified system conditions.

**Capacity Benefit Margin (CBM):** The amount of firm transmission transfer capability preserved by the transmission provider for Load-Serving Entities (LSEs), whose loads are located on that Transmission Service Provider's system, to enable access by the LSEs to

generation from interconnected systems to meet generation reliability requirements. Preservation of CBM for an LSE allows that entity to reduce its installed generating capacity below that which may otherwise have been necessary without interconnections to meet its generation reliability requirements. The transmission transfer capability preserved as CBM is intended to be used by the LSE only in times of emergency generation deficiencies.

**Transmission Reliability Margin (TRM):** The amount of transmission transfer capability necessary to provide reasonable assurance that the interconnected transmission network will be secure. TRM accounts for the inherent uncertainty in system conditions and the need for operating flexibility to ensure reliable system operation as system conditions change.

The definitions used in the Commission's notice of inquiry (and used in the NERC LTATF report) are not in conflict with the definitions currently in effect in the NERC reliability standards. However, because the NERC definitions were just reviewed as part of the NERC Version 0 standards effort, which included extensive industry input, NERC believes that the definitions as stated above and as currently in use by the industry are, and continue to be, appropriate. NERC notes that some inconsistencies currently exist with today's lexicon of ATC and related terms because some entities have established their own definitions for these terms that are inconsistent with the NERC definitions. As revisions to the NERC reliability standards progress, the existing definitions will continue to be a subject of industry discussion and affirmation.

The definition for Available Flowgate Capability ("AFC"), as defined in the notice of inquiry (at para. 5), is "a measure of the capability remaining on a flowgate for future uses, after considering the effect of prior sales. AFC is measured as a flow limit on a flowgate, while ATC is measured as a transaction limit from a source to a sink." There are several definitions for AFC in the industry, but NERC does not have a formal definition for AFC. The definition used within the notice of inquiry is generally

consistent with the application of AFC within the industry. However, NERC recommends that a definition for “flowgate” and “Available Flowgate Capability” be established through industry consensus using the NERC reliability standards process to ensure that a consistent and common language is used in reference to these terms.

Further, the NERC ATC and TTC standards must be expanded to include flowgates and AFC along with a description of the key elements and requirements that must be addressed in the calculation of AFC values. In addition, the relationship of AFC to ATC and TTC must be clearly defined along with the manner in which they will be used and coordinated in accounting for transmission reservations and schedules. The NERC Planning Committee has already provided the above comments on AFC to the NERC standards effort in connection with the LTATF’s two proposed SARs on ATC/TTC/AFC and CBM/TRM.

**(b) The advisability of revising and standardizing AFC, ATC, TRM and CBM values**

NERC believes that apparent problems with the AFC, ATC, TRM and CBM values are largely a product of different definitional interpretations, potential oversimplification of calculation, and unavailability of data and assumptions (in a usable form/format) from neighboring ATC calculators. Steps to remove these real or perceived impediments would be beneficial to the industry and will be part of NERC’s effort to revise its ATC, TTC, CBM, and TRM standards.

The NERC compliance reviews for its ATC, TTC, CBM, and TRM standards, to be initiated in 2006, and the anticipated revisions to the NERC ATC, TTC, CBM, and TRM standards as a result of the LTATF’s proposed SARs should help to remove the impediments to reserving and scheduling transmission services and will continue to

increase the transparency of these parameters in the electricity market. The proposed revisions to the ATC, TTC, CBM, and TRM standards should also strengthen the NERC standards in terms of increased communication and coordination, standardization, and consistency.

**(c) The advisability of developing interconnection-wide standards for the Eastern Interconnection and the WECC**

The NERC ATC, TTC, CBM, and TRM reliability standards are applicable to the entire North American bulk electric system. Admittedly, these standards tend to emphasize documentation of what is currently being done in calculating ATC, and what assumptions are being made by each ATC calculator. NERC believes that the industry must take the next step in standards development of these subjects and focus upon commonality of calculation techniques; increased consistency in assumptions, data exchange, and calculation coordination among ATC calculators; the inclusion and consideration of potential limitations in neighboring systems; and increased frequency of ATC calculation.

Regardless of the Interconnection, a viable forecast of the transmission transfer capability available to the market is the common goal, and the physical limitations that are the basis for capability limitations are not Interconnection-specific. Because the NERC reliability standards are currently applicable to all three Interconnections in North America (Eastern, Western, and ERCOT), NERC has every expectation that future enhancements of its ATC-related standards can continue to be a common set of standards applicable across all of these Interconnections.

**(d) The contents of the LTATF Report**

NERC's Market Committee created the LTATF to develop specific recommendations for the calculation and coordination of AFC/ATC to increase market liquidity and enhance reliability. The LTATF's report calls for increased communication and coordination of AFC/ATC, improved documentation and greater transparency of AFC/ATC calculation processes, increased consistency among AFC/ATC calculations, and consistency between planning and operating criteria and the attributes of AFC/ATC calculations. The existing NERC ATC and TTC methodology prescribes a set of requirements that must be addressed in calculating ATC and TTC values.

While the current methodology provides a degree of commonality in the calculations, NERC agrees that the commonality needs to be strengthened. This strengthening of the calculation requirements refers to additions and refinements to the elements or parameters to be addressed in the calculation methodology and not to the tools or equipment used for the calculations. Some examples of the elements critical to reliability and for which further standardization in the ATC, AFC, and TTC calculations should be required and developed include: (1) coordination in the exchange and use of system data within the regions and among adjacent regions, (2) the monitoring of critical limiting transmission facilities under appropriate contingencies consistent with planning and operating criteria, (3) consistency in the manner in which transmission services are reserved, scheduled, and accounted in the calculations, (4) using reasonable and consistent generation dispatch assumptions, (5) meeting a minimum frequency of ATC, AFC, and TTC calculations, (6) base case model building (i.e., what data needs to be incorporated and updated), (7) ATC, AFC, and TTC calculators (those who are

responsible for calculating ATC, AFC, and TTC values) who impact each other's transmission system must have appropriate and adequate model representation (load level, generation dispatch, transmission and generation outages) of each other's system and use that information in their calculations, and (8) the monitoring of transmission facilities based on the use of an appropriate distribution cutoff factor.

The notice of inquiry (at para. 20) noted that the LTATF observed:

some transmission providers first calculate TTC, and then derive ATC. Others first calculate ATC, and then derive TTC. Some transmission providers first calculate AFC, and then derive ATC. Some only calculate TTC. Some transmission providers use CBM; some do not use CBM.

Although this may seem to be a source of confusion and incompatibility among the calculators of ATC and the coordination of ATC values, it need not be the case. TTC, ATC, and AFC are all interrelated terms that describe, or forecast conditions of, the same physical system for some point or period in the future. Generally, the calculation order of any one of these values is not a notable determinate of the accuracy of these values.

Often, it is improperly inferred that the order in which these values are determined impact the accuracy of the result. The order of calculation does not impact the accuracy of calculation. Generally, the term that is calculated first by the various ATC calculators is the term that has the most relevance in reliability analyses for that portion of the bulk electric system. For example, the northwest portion of the Eastern Interconnection is typically stability limited, and, therefore, the total transfer of electric power from one area to another (i.e., TTC) is considered the best descriptor of the capability of that portion of the network. Similarly, the Midwest tends to be more thermally limited and can often be described in terms of a small set of facilities (i.e., transmission lines) that may or will overload for a given set of conditions. For these areas, incremental transfer capabilities

(i.e., ATC or even more locally, AFC) tend to be more intuitive descriptors of the transmission limitations of that area of the Eastern Interconnection. However, once any one of these values is properly determined, the determination of the other needed values can be calculated.

While on the surface, the calculation of ATC may not appear to be a difficult task; in fact, the calculation is quite complicated, particularly given that transmission service providers are making calculations that affect service offered by other transmission service providers. By definition, ATC is TTC less expected uses, less margins (or, similarly, TTC is ATC plus expected uses and margins). The definition of ATC infers simplicity of calculation. Although this calculation appears to be a simple algebraic calculation (like a checkbook), in fact the calculation is not algebraic but rather more complicated. For example, if each of four areas, A, B, C, and D, is interconnected with the other three, the ATC from A to B is dependant upon the expected use(s) of the transmission system between C and D and every other pairing. It should also be noted that the transmission transfer capability from A to B is generally not the same as from B to A.

In addition, if each of the four areas is also an ATC or AFC calculator, each must make individual assumptions, including, for example, the native load level and the generation dispatch for the calculator's own area, and each must also include similar information for the adjacent areas. Different, but reasonable, assumptions on these parameters will naturally lead to different conclusions, hence different ATC (or AFC) values. The timing of when reservations are made by transmission customers across multiple transmission service providers will also contribute to different conclusions.

NERC believes that enhanced data exchange protocols among transmission service providers are appropriate to further improve the ATC or AFC values. This philosophy is promoted in the LTATF report. These data exchange protocols create a common set of calculation inputs, assumptions, and exchanged outputs that promote consistency of results among the ATC and AFC calculators. These protocols should also establish processes to coordinate transmission service request evaluations across borders minimizing inadvertent overselling of the transmission system that often results in transmission congestion.

Further, it needs to be clarified that the LTATF in its April 2005 report has not recommended that a single, interconnection-wide transfer capability methodology or calculation tool be mandated. Despite the difficulties, NERC believes that through commonality of calculation techniques, assumptions, communication, the exchange of data among the various ATC and AFC calculators, and the documentation of methods and assumptions the calculation of ATC and AFC values can be made more transparent, consistent, and useful to the marketplace without negatively impacting the reliability of the bulk transmission systems.

**(e) The most expeditious way to obtain industry-wide standards for ATC calculations**

In any approach, opportunities for broad industry participation in standards development must be afforded. The existing NERC reliability standards process that begins with the development of a standard authorization request (“SAR”) by an individual, group, entity, or SAR drafting team is the best model for reliability standards development. The work of the SAR drafting team and any subsequent standards

development team can be accelerated to accommodate a reasonable date for finalization of a new or revised standard. The same is likely the case for business practice standards developed through NAESB.

### **Conclusion**

NERC intends to be involved in any enhancements of or revisions to its April 1, 2005 ATC, TTC, CBM, and TRM standards because ATC and related values are derived from reliability-based standards and the physical characteristics and limitations of the electric system. The ATC values represent the transmission transfer capability that can be utilized by the electricity market while still maintaining reliability.

The NERC ATC, TTC, CBM, and TRM standards are applicable to the entire North American bulk electric system. They prescribe a set of requirements that must be addressed in calculating ATC and related values. While the current standards provide a degree of commonality in the calculations, that commonality needs to be expanded and strengthened for increased consistency.

The LTATF standard authorization requests of July 2005 that propose revisions to the NERC ATC, TTC, CBM, and TRM standards, and its proposed NAESB business practice standard of March 2005 have provided the impetus to make additions and refinements to the elements to be addressed to increase communication, coordination, and consistency in the calculation of ATC and related values. Increased communication, coordination, and consistency of ATC, TTC, CBM, and TRM values also should help to promote greater transparency of these parameters in the electricity market. In the meantime, NERC will begin reviews for compliance with its existing ATC, TTC, CBM, and TRM standards as part of its 2006 compliance enforcement program.

NERC will coordinate with NAESB on its development of proposed business practice standards as recommended by NERC's LTATF regarding business process issues associated with transmission reservations and services. However, all aspects dealing with reliability will continue to be handled by NERC.

NERC thanks the Commission for affording it the opportunity to report on its current ATC-related activities and to comment on the industry's need for increased information requirements for ATC and related values to promote greater communication, coordination, consistency, and transparency for these parameters in the electricity market. NERC looks forward to continuing to work with the Commission and the industry on these matters.

Respectfully submitted,

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