NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

ATCT Standards Drafting Team Meeting

Sheraton Suites Tampa Airport
4400 West Cypress Street, Tampa FL
Phone 813-873-8675

February 7, 2007: 8:00 am – 5:00 pm (Eastern Time)
Conference call phone number 1(732)694-2061 Conference code is t.b.d. 1165020707#
Meeting number: 711 483 254 Meeting password: 123456
https://nerc.webex.com

February 8, 2007: 8:00 am – 5:00 pm (Eastern Time)
Conference call phone number 1(732)694-2061 Conference code is t.b.d. 1165020807#
Meeting number: 716 547 729 Meeting password: 123456
https://nerc.webex.com

Agenda

1) Administration

a) Welcome and Introductions — Larry Middleton
Chairman Middleton will lead the welcome of the ATCT drafting team members and guests. NERC ATCT Drafting Team Roster (**Attachment 1a**)

b) Antitrust Compliance Guidelines — Bill Lohrman (**Attachment 1b**)
Bill Lohrman will review the NERC Antitrust Compliance Guidelines provided in Attachment 1b. It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition. It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

c) Review of Agenda — L. Middleton
Chairman Middleton will review the objectives of the meeting.

d) Approval of meeting minutes — B. Lohrman
The drafting team will be asked to approve the minutes (**Attachment 1d to be sent via separate email**) of the January 22-23, 2007 meeting.

2) MOD-001 – 1

a) The drafting team will review the status of MOD-001-1 and the tentative schedule for posting and reviewing comments.

ATCT Drafting Team
Agenda
February 7 – 8, 2007

3) MOD-003-1

a) The drafting team will consider comments from NAESB regarding the draft of the proposed MOD-003-1 (**Attachment 3a**).
b) The drafting team will review the draft comment form for the proposed MOD-003-1. (**Attachment 3b**)

4) TRM – L. Middleton

a) Chairman Middleton will lead the drafting team in a review of the changes began at the last drafting team meeting to the TRM standards using the straw man (**Attachment 4a**) from Nate Schweighart.
b) The drafting team will review MOD-009 (**Attachment 4b**) for any requirements to be transferred to MOD-008 prior to recommending deletion of MOD-009.
c) Chairman Middleton will continue the review of changes to the TRM standards using the straw man documents (**Attachment 4c1 and 4c2**) from Chuck Falls and Narinder Saini.
d) The MISO PJM methodology (**Attachments 4d1 and 4d2**) will also be used as a resource in evaluating changes to the TRM methodology.

5) ETC Requirements – L. Middleton

a) Chairman Middleton will lead the drafting team in developing proposed requirements for Existing Transmission Commitments requirements. The WECC ETC documentation (**Attachment 5a**) will be used as a reference

6) CBM – L. Middleton

a) Chairman Middleton will lead the drafting team in developing proposed changes to the CBM standards using the CBM/TRM SAR (**Attachment 6a1**), the proposed NAESB business practice (**Attachment 6a2**), and the minority CBM paper (**Attachment 6a3**) from the ATCT SAR drafting team as references for beginning work. The team will develop criteria for revising the standards.

7) FAC 12 / FAC 13 – L. Middleton

a) Chairman Middleton will lead the drafting team in a review of the changes necessary to begin work on the FAC-12 and FAC-13 standards (**Attachments 7a1 and 7a2**).

8) Review of meeting schedules – L. Middleton

a) March 1-2, 2007 noon to noon, in either Memphis or Nashville (*tentative, do not make non-refundable reservations until the hotel is confirmed*)
b) March 13, 2007 8:00 am to 5pm, March 14, 2007 8:00am to noon at the Salt River Project operations center located at 6504 E Thomas Rd, Scottsdale, AZ 85281.

Adjourn

Attachment 1a

ATC-TTC-AFC-CBM-TRM Standards Drafting Team

Chairman	Larry W. Middleton Transmission Asset Management	Midwest ISO, Inc. 701 City Center Drive Carmel, Indiana 46032	(317) 249-5447 (317) 249-5703 Fx lmiddleton@ midwestiso.org
	Matthew T. Ansley Sr. Engineer	Southern Company Services, Inc. 20 Eddings Lane Montevallo, Alabama 35115	(205) 257-3472 mansley@ southernco.com
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	E. Nick Henery Director of Reliability Standards and Compliance	American Public Power Association 2301 M Street, N.W. Washington, DC 20037-1484	(202) 467-2985 NHenery@APPAnet. org
	Raymond K. Kershaw Transmission Operations Engineer	International Transmission Company 39500 Orchard Hill Place Suite 205 Novi, Michigan 48375	(248) 444-1209 (248) 374-7137 Fx rkershaw@ itctransco.com
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	Ross Kovacs Trans. Strategic Coordinator	Georgia Transmission Corporation 2100 E. Exchange Place Tucker, Georgia 30085	(770) 270-7857 ross.kovacs@ gatrans.com
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	Cheryl Mendrala Tariff and Contract Administrator	ISO New England, Inc. One Sullivan Road Holyoke, Massachusetts 01040	(413) 535-4184 (413) 535-4399 Fx cmendrala@ iso-ne.com
	Rob Morasco Engineer	PJM Interconnection, L.L.C. 955 Jefferson Avenue Norristown, Pennsylvania 19403	(610) 635-3452 morasr@pjm.com

	Narinder K. Saini Policy Consultant	Entergy Services, Inc. 5201 W. Barraque Pine Bluff, Arkansas 71603	(870) 543-5420 (870) 541-4528 Fx nsaini@ entergy.com
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	Jerry W. Smith	Arizona Public Service Co. Mail Station 2260 PO Box 53999 Phoenix, Arizona 85072-3999	(602) 250-1155 jerry.smith@ aps.com
	Nathan Schweighart	Tennessee Valley Authority 1101 Market Street MR-5G Chattanooga, Tennessee 37402-2801	(423) 751-4365 (423) 751-3453 Fx naschweighart@ tva.gov
	W. Shannon Black Sr. Regulatory and Contract Specialist	SMUD 6301 S Street Sacramento, CA	916-732-5734 sblack@smud.org
NERC Staff Coordinator	William W. Lohrman Managing Director	Prague Power, LLC 31 Maple Street, Suite 102 Bernardsville, New Jersey 07924	(908) 630-0289 wwlohrman@ praguepower.com

Attachment 1b

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

NERC ANTITRUST COMPLIANCE GUIDELINES

I. GENERAL

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. PROHIBITED ACTIVITIES

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.

Approved by NERC Board of Trustees, June 14, 2002
Technical revisions, May 13, 2005

III. ACTIVITIES THAT ARE PERMITTED

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation and Bylaws are followed in conducting NERC business. Other NERC procedures that may be applicable to a particular NERC activity include the following:

- Reliability Standards Process Manual
- Organization and Procedures Manual for the NERC Standing Committees
- System Operator Certification Program

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.

- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.

- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.

- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

Attachment 3a

Standard MOD-003-1 — Procedure to resolve comments and questions regarding ATC and AFC Methodologies and Values

A.

B. Introduction

1. **Title:** Procedure to resolve comments and questions regarding ATC and AFC Methodologies and Values

2. **Number:** MOD-003-1

3. **Purpose:** To promote the communication of Transmission Service Provider calculation methodologies and values used for calculating Available Transfer Capability (ATC), and Available Flowgate Capability (AFC) among Transmission Customers.

NAESB Comment: This should be business practice; it only addresses and penalizes failures to communicate. Communication is typically a NAESB business practice development area. Failure to communicate to does not affect reliability of the system.

NAESB Comment: Is this talking about values that go into the calculation or the actual calculated ATC/AFC value itself? Need clarification on this item.

4. **Applicability:**

   4.1. Each Transmission Service Provider

   4.1.1 Entity Limitations. Transmission Service Providers that are not required to have an OASIS may publish on a publicly available Web site the information discussed in the requirements and measurements sections of this standard.

NAESB Comment: Are there any non-jurisdictional entities that 4.1.1 would actually apply to?

5. **Effective Date:** t.b.d.

C. Requirements

R1. The Transmission Service Provider shall post on OASIS the telephone number and email address of a contact person to whom concerns are to be addressed regarding the AFC and the ATC methodologies and their associated numeric values. [Risk factor: t.b.d]

NAESB Comment: Concerned about having two methods of contacting TSPs

NAESB Comment: Being expected to post new names with shift changes will be administrative burden for TP.

NAESB Comment: The person who knows the methodology is not necessarily the same individual who contributes to the day to day ATC/AFC posting; posting of one e-mail address will not necessarily be sufficient for answering all questions.

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R2. Each Transmission Service Provider shall create on its OASIS an electronic data input ~~field~~ form for the specific purpose of receiving and responding to queries regarding the AFC and the ATC methodologies and their associated numeric values. [Risk factor: t.b.d]

NAESB comment: Need clarification whether standard would allow submission of question through e-mail as provided in R1 or only through OASIS posting as set forth in R2?

NAESB Comment: If questions are accepted through e-mail are those also required to be posted on OASIS?

R3. Subject to commercial confidentiality constraints, within one week of the electronic receipt of a query received via the aforementioned ~~field~~ form in R2, the Transmission Service Provider shall post on OASIS an answer to the received query. [Risk factor: t.b.d]

NERC comment: NAESB will be asked to create a template(s) for OASIS postings

NAESB Comment: If NAESB develops template for posting and is not referenced in the NERC standard, does that mean this requirement lends itself to being adopted by NAESB?

NAESB Comment: R3 treats all queries equally. All queries must be responded to within a week. Some may take longer to respond to due to the nature of the query. Limitation of 1 week appears to be arbitrary. It is the understanding of the NAESB subcommittee that R3 only addresses queries submitted under R2.

D. Measures

M1. The Transmission Service Provider shall have documentation that information required by MOD-003-1 R1 was posted on OASIS.

M2. The Transmission Service Provider shall provide upon request the internet location of the OASIS website containing the information required by MOD-003-1 R2.

M3. The Transmission Service Provider shall have documentation, such as a log, containing the information required by MOD-003-1 R3 demonstrating the timeframe within which the answer was provided.

E. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

Rolling 3 years

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1.3. Data Retention

Rolling 3 years

1.4. Additional Compliance Information

None.

2. Mitigation Time Horizon

2.1. Long-term planning – t.b.d.

2.2. Operations Planning - t.b.d.

2.3. Same-day Operation – t.b.d.

2.4. Real-time Operations – t.b.d.

2.5. Operations Assessment – t.b.d.

3. Violation Severity Level

3.1. Lower:

1.3.1. R3: 1 to 5% of the inquiries received were not answered within 1 week during the prior twelve (12) months

3.2. Moderate:

2.3.1. R3: more than 5% and up to and including 15% of the inquiries received were not answered within 1 week during the prior twelve (12) months

3.3. High:

3.3.1. R3: more than 15% and up to and including 30% of the inquiries received were not answered within 1 week during the prior twelve (12) months

3.3.2. R1: Contact information is incorrect

3.4. Severe:

4.3.1. R1: Contact information is not posted

4.3.2. R2: Inquiry form is not posted

4.3.3. R3: more than 5% of the inquiries were never responded to.

4.3.4. R3: more than 30% of the inquiries received were not answered within 1 week during the prior twelve (12) months

NAESB Comment: There is no real definition what constitutes a valid query. There is potential for queue flooding with spurious queries.

NAESB Comment: Suggestion that a threshold needs to be established for those entities that have low numbers of inquiries.

NERC Comment: Queries are for valid questions when denied: why ATC was what it was; rewrite language so that it says what the intent is: for queries to justify denial

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Comment: There is no real definition what constitutes a valid query. There is potential for queue flooding with spurious queries.¶
Lohrman's Comment: Queries are for valid questions when denied: why ATC was what it was; rewrite language so that it says what the intent is: for queries to justify denial¶
¶

F. Regional Differences

1. None identified.

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Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New
1	Dec 13, 2006	T.B.D	Revised
1	Jan 22, 2007	T.B.D., applicability	Revised
1	Jan 30, 2007	Review with NAESB	Revised with comments

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Procedure for Input on Total Transfer Capability and Available Transfer Capability Methodologies and Values

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the consistent and uniform application

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Transfer Capability

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among Transmission Service Providers, the Regional Reliability Organizations need to review adherence to Regional methodologies

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Total Transfer Capability (TTC) and

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Comment: NAESB comment that this should be business practice; it only addresses and penalizes failures to communicate. Communication is typically a NAESB business practice development area. Failure to communicate to does not affect reliability of the system.

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April 1, 2005

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Each Regional Reliability Organization, in conjunction with its members, shall develop and document a procedure on how transmission users can input their concerns or questions regarding the TTC and ATC methodology and values of the Transmission Service Provider(s), and how these concerns or questions will be addressed. The Regional Reliability Organization's procedure shall specify the following:

The name, telephone number and email address of a contact person to whom concerns are to be addressed.

The amount of time it will take for a response

.

The manner in which the response will be communicated (e.g., email, letter, telephone, etc).

What recourse a customer has if the response is deemed unsatisfactory.

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Regional Reliability Organization

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a web site that is accessible by the Regional Reliability Organizations, NERC, and transmission users,

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its procedure for receiving and addressing concerns about

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the TTC and ATC methodology and TTC and ATC values of member Transmission Service Providers

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Comment: R3 treats all queries equally. All queries must be responded to within a week. Some may take longer to respond to due to the nature of the query. Limitation of 1 week appears to be arbitrary. It is the understanding of the NAESB subcommittee that R3 only addresses queries submitted under R2.

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Regional Reliability Organization

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evidence

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that its procedure for receiving input for ATC and TTC methodologies and values meets Reliability Standard MOD-003-0_R1.

Page 2: [18] Deleted **Laura Kennedy** **1/30/2007 11:07:00 AM**

provide

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.

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The Regional Reliability Organization shall have evidence that its procedure for receiving input for ATC and TTC methodologies and values is available on a web site accessible by the Regional Reliability Organizations, NERC, and transmission users.

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Procedure available on a web site accessible by the Regional Reliability Organizations, NERC, and transmission users.

Attachment 3b

Please use this form to submit comments on the first draft of the ATC/AFC Methodology Documentation Standard (MOD-003- Procedure to resolve comments and questions regarding ATC and AFC Methodologies and Values). Comments must be submitted by **T.B.D**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "ATC/AFC Methodology" in the subject line. If you have questions please contact Bill Lohrman at wwlohrman@praguepower.com or 908-630-0289.

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Deleted: TC and AFC Calculation Methodologies

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

DO: **Do** enter text only, with no formatting or styles added.

Do use punctuation and capitalization as needed (except quotations).

Do use more than one form if responses do not fit in the spaces provided.

Do submit any formatted text or markups in a separate WORD file.

DO NOT: **Do not** insert tabs or paragraph returns in any data field.

Do not use numbering or bullets in any data field.

Do not use quotation marks in any data field.

Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ **ERCOT** ☐ **FRCC** ☐ **MRO** ☐ **NPCC** ☐ **RFC** ☐ **SERC** ☐ **SPP** ☐ **WECC** ☐ **NA – Not Applicable**	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	3 — Load-serving Entities
	☐	4 — Transmission-dependent Utilities
	☐	5 — Electric Generators
	☐	6 — Electricity Brokers, Aggregators, and Marketers
	☐	7 — Large Electricity End Users
	☐	8 — Small Electricity End Users
	☐	9 — Federal, State, Provincial Regulatory or other Government Entities

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Background Information

The Long-Term AFC/ATC Task Force (LTATF) was formed to develop specific recommendations for the calculation and coordination of AFC[1]/ATC[2] with the goal of increasing market liquidity and enhancing grid reliability. The task force's work was coordinated with NAESB[3] to separate business practices from reliability concerns. The LTATF evaluated the results of the short-term recommendations in the Alliant West area for summer 2004[4], and used this evaluation when considering whether to recommend the Alliant West short-term recommendations continue. The work resulted in the formation of a SAR[5] Drafting Team who formed recommendations that are the basis for the formation of a Standard Drafting Team.

In developing their recommendations the NERC LTATF considered the calculation for AFC/ATC, communication and coordination of AFC/ATC, and consistency between transmission planning and AFC/ATC calculations. A final LTATF report[6] was presented to the Standing Committees in March 2005. The task force used the report and recommendations to develop proposed standards for AFC/TFC[7]/ATC/TTC[8] and CBM/TRM. The proposed "MOD-003-1 Procedure to resolve comments and questions regarding ATC and AFC Methodologies and Values" Standard is the subject matter for this Comment Form.

The proposed standard labeled MOD-003-1 outlines requirements for the procedure to resolve comments and questions regarding ATC and AFC methodologies and values. The proposed standard.

Clarification of Capacity Benefit Margin and Transmission Reserve Margin will be subsequently addressed by the drafting team in proposed revisions to the respective standards dealing with those values.

The Standards Committee and Standard Drafting Team (ATCTDT) would like to receive industry comment on the proposed standard.

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Deleted: calculation of ATC and AFC, but does not provide requirements for the calculation of TFC or TTC

Deleted: may reference NERC Standard(s) FAC-012 and/or FAC-013 as the source for the requirements for calculation of TTC and/or TFC. Currently FAC-012 identifies requirements for the calculation of inter-regional and intra-regional Transfer Capabilities (TC). The term TTC is not mentioned in FAC-012, as described in the FERC NOPR[9]

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Deleted: A distinct definition for the TC and TTC terms appears in the NERC *Glossary of Terms Used in Reliability Standards*[10]. The members of the drafting team are proposing that they are basically the same quantity and should be covered in a single standard in FAC-012 . Consequently, the draft version of MOD-001-1 does not contain calculation requirements for TTC. The drafting team is seeking input from the industry on this question (see Comment Form questions 13 and 14). The comment form includes questions asking whether the values for TC and TTC should be considered the same value. The questions in the comment form also ask for feedback regarding the appropriate standard in which to determine TTC and TFC (see Comment Form questions 15 and 16).

Deleted: If the calculation of AFC and ATC are ultimately dependent upon values derived in the FAC-012 and/or the FAC-013 standard(s), the drafting team will revise FAC-012 and/or FAC-013 as necessary prior to balloting MOD-001-1 so that industry will know how those precursor values will be developed. A partial list of these precursor values could include:¶
<#>Semi-annual summer and winter TTC values ¶
<#>Assumptions used for modeling generation dispatch¶
<#>Transmission and generation outage schedules¶
<#>Power flow models¶
<#>Load forecasts¶
<#>Path definitions and facility ratings¶
<#>Algorithms¶
<#>¶

[1] AFC = Available Flowgate Capability
[2] ATC = Available Transfer Capability
[3] NAESB = North American Energy Standards Board
[4] ftp://www.nerc.com/pub/sys/all_updl/docs/pubs/AWTTF_Final_Report_032604.pdf
[5] SAR = Standards Authorization Request
[6] ftp://www.nerc.com/pub/sys/all_updl/mc/ltatf/LTATF_Final_Report_Revised.pdf
[7] TFC = Total Flowgate Capability
[8] TTC = Total Transfer Capability
[15] ftp://www.nerc.com/pub/sys/all_updl/standards/sar/SAR_ATC-TTC_R2_15Feb06.pdf

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Is there a reliability need for this proposed standard? If not, please explain your answer.

   ☐ Yes

   ☐ No

   Comments:

2. Is the title appropriate for the scope of the standard?? Please explain your answer.

   ☐ Yes

   ☐ No

   Comments:

3. Is the purpose of the proposed appropriate for the scope of the standard?? Please explain your answer.

   ☐ Yes

   ☐ No

   Comments:

4. Does the proposed standard include the correct Reliability Functions in the applicability section of the proposed standard? If not, please explain which functions need to be added or deleted and why.

   ☐ Yes

   ☐ No

   Comments:

5. Does the proposed standard address the goals of the related SAR[15] and the LTATF report[16] to improve communication, coordination, standardization, and transparency? If not, please explain.

   ☐ Yes

   ☐ No

   Comments:

[16] ftp://www.nerc.com/pub/sys/all_updl/mc/ltatf/LTATF_Final_Report_Revised.pdf

Deleted: Is the definition for ETC contained in this standard sufficient for the industry to calculate the ETC in a consistent and reliable manner

Deleted: <#>If it is determined that additional requirements and measures are needed for the calculation of ETC, should these requirements and measures for the calculation of ETC be contained within this standard, or should a new standard strictly for ETC be written? If so please explain.¶
☐ Yes ¶
☐ No ¶
Comments:¶
¶

Deleted: Should the definition for Transmission Service Request in this proposed standard be expanded or changed

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Deleted: <#>Should the drafting team definition for Flowgate be used to replace the Flowgate definition in the NERC *Glossary of Terms Used in Reliability Standards*[11]? Please explain your answer.¶
☐ Yes ¶
☐ No ¶
Comments:¶

Deleted: <#>Do you agree with the remaining definition of terms used in the proposed standard? If not, please explain which terms need refinement and how.¶
☐ Yes ¶
☐ No ¶
Comments:¶

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<#>The standard drafting team has identified three methodologies in which the ATC and AFC are calculated (Rated System Path - ATC, Network Response - ATC and Network Response - AFC, methodolo ... [1]

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6. Do you agree with the proposed requirements included in the proposed standard? If not please explain with which requirements you do not agree and why.

☐ Yes

☐ No

Comments:

7. Do you agree with the Measures listed in the proposed standard? If not, please explain your answer.

☐ Yes

☐ No

Comments:

8. Do you agree with the Violation Severity Levels[17] in this proposed standard? If not, with which do you disagree and why (please specify)?

☐ Yes

☐ No

Comments:

9. Are you aware of any conflicts between the proposed standard and any regulatory function, rule/order, tariff, rate schedule, legislative requirement or agreement?

Comments:

10. Do you have other comments on the proposed standard?

Comments:

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[17] Please see APPENDIX attached to this comment form

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<#>Should any of the data elements required to be exchanged among Transmission Service Providers in this proposed standard be provided to any other functional entities? Please explain your answer.¶
☐ Yes ¶
☐ No ¶
Comments:¶
¶
<#>Is the frequency of providing data specified in this proposed standard appropriate? Please explain your answer.¶
☐ Yes ¶
☐ No ¶
Comments:¶

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¶
<#>Do you agree with the Measures listed in the proposed standard? If not, please explain your answer.¶
☐ Yes ¶
☐ No ¶
Comments:¶

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Page 4: [1] Deleted **Administrator** **2/1/2007 9:16:00 PM**

The standard drafting team has identified three methodologies in which the ATC and AFC are calculated (Rated System Path - ATC, Network Response - ATC and Network Response - AFC, methodologies). In developing this standard has the standard drafting team adequately addressed these methodologies? Please explain if you feel the team has not adequately addressed these methodologies within the proposed standard.

- Yes
- No

Comments:

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The standard drafting team has identified three methodologies in which the ATC and AFC are calculated (Rated System Path - ATC, Network Response - ATC and Network Response - AFC, methodologies). Should the drafting team consider other methodologies? Please explain.

- Yes
- No

Comments:

The standard drafting team has identified that the Transmission Service Provider shall choose only one of the three methodologies for the Transmission Service Provider's entire system in which the ATC and AFC are calculated (Rated System Path - ATC, Network Response - ATC and Network Response - AFC, methodologies). If chosing just one of these methods is not sufficient for your system, please explain why.

- Yes
- No

Comments:

Do you agree with the proposed requirements included in the proposed standard? If not please explain with which requirements you do not agree and why.

- Yes
- No

Comments:

Does the proposed standard sufficiently address the reliability concerns expressed in the NERC LTATF Report[1] or the FERC NOPR[2]? If not, then please explain.

- Yes

---

[1] ftp://www.nerc.com/pub/sys/all_updl/mc/ltatf/LTATF_Final_Report_Revised.pdf
[2] http://www.ferc.gov/whats-new/comm-meet/051806/E-1.pdf

☐ No

Comments:

Should the proposed standard include further standardization for the components of the calculation of ATC or AFC (i.e., should the proposed standard be more prescriptive regarding the consistency and standardization of determining TTC, TFC, ETC, TRM, and CBM)? If so, please explain.

☐ Yes

☐ No

Comments:

Do you agree that Total Transfer Capability (TTC) referenced in the MOD standards and Transfer Capability (TC) references in the FAC-012-1 and/or FAC-013-1 standards are the same and should be treated as such in developing this standard? Please explain your answer.

☐ Yes

☐ No

Comments:

If you agree in question 11 that TTC and TC represent the same values, should MOD-001-1 address the Total Transfer Capability (TTC) methodology and documentation, as opposed to having the TTC methodology addressed by revising the existing Facility Rating FAC-012-1 and/or FAC-013-1 standards as proposed by FERC NOPR[3]? Please explain your answer.

☐ Yes

☐ No

Comments:

If you do not agree in question 11 that TTC and TC represent the same values, how should the drafting team address the similarity between Transfer Capability (TC) and Total Transfer Capability (TTC) methodology and documentation? Please explain your answer.

Comments:

As mentioned in the introduction, the drafting team has deferred development of requirements for the calculation of Total Flowgate Capability (TFC) pending industry comments. The drafting team would like to know whether the industry believes that MOD-001-1needs to address TFC methodology and documentation as opposed to having the TFC methodology addressed by revising the existing

[3] http://www.ferc.gov/whats-new/comm-meet/051806/E-1.pdf

Facility Rating FAC-012-1 and/or FAC-013-1 standards? Please explain your answer.

- Yes
- No

Comments:

Is the requirement in this proposed standard to specify the ultimate source and sink necessary for the ATC methodologies (see requirements R2.1.4 and R3.1.3)? Please explain your answer.

- Yes
- No

Comments:

Would the provision of a link to the location of a TSP's data be sufficient in satisfying the requirement(s) to exchange data for this proposed standard? Please explain.

- Yes
- No

Comments:

When calculating ATC and monthly, daily, weekly, and hourly AFC values, what time horizon(s) for CBM should be used and which reliability function(s) should make the CBM calculations? Please explain.

Comments:

When calculating ATC and monthly, daily, and hourly AFC values, what time horizon(s) for TRM should be used, and which reliability function(s) should make the TRM calculations? Please explain.

Comments:

Should NERC work with NAESB to determine whether updates to ETC and ATC values should be posted after the transmission request is accepted or after it has been confirmed? Please explain.

Comments:

Page Break

In order to maintain consistency with planning requirements, should NERC work with NAESB to establish a business practice to monitor Load Serving Entities (LSE), Generation Operators, or Purchasing/Selling Entities that might reserve transmission service in multiple directions in excess of either the LSE load or the capacity of the generator? If so, please explain.

- Yes

☐ No

Comments:

Attachment 4a

Standard MOD-008-0 — Calculation and Documentation Methodology for TRM

A. Introduction

1. **Title:** Calculation and Documentation Methodology for Transmission Reliability Margin

2. **Number:** MOD-008-0

3. **Purpose:** To promote the consistent use of a calculation and documentation methodology for each Transmission Service Provider's Transmission Reliability Margin

4. **Applicability:**

   4.1. Transmission Service Provider

5. **Effective Date:**

B. Requirements

R1. Transmission Service Providers are not required to use Transmission Reserve Margin, but for those that do, shall follow the requirements in R2 – Rxx.

R2. Transmission Reliability Margin consists of two components, the uncertainty component and the generation reserve sharing component. Each Transmission Service Provider must define, within the limits of the standard, and document an amount set aside to make up each component of the Transmission Reliability Margin.

Need ***for whom*** TRM is set aside

R2.1. Each Transmission Service Provider will define a percentage of transmission element facility ratings (of facilities used as limits in ATC calculations) as the uncertainty component of the Transmission Reliability Margin. Each element or groups of elements may have different percentages set aside as long as it is clear in the documentation what percentage is set aside for each element or group of elements.

R1.2.1. If the percentage defined for a specific element or group of elements, used as limits in ATC calculations, is between 0% and 2%, then the Transmission Service Provider must provide an explanation in its documentation why that percentage is used and historical data that reinforces the explanation.

R1.2.2. If the percentage defined for a specific element or group of elements, used as limits in ATC calculations, is greater than 2% and less than 5%, then the Transmission Service Provider must provide an explanation in its documentation why that percentage is used and historical data that reinforces the explanation..

R1.2.3. If a percentage defined for a specific transmission element or group of elements is greater than 5% then the Transmission Service Provider must provide in its documentation an explanation of why the higher percentage is need and historical data that reinforces the explanation. The historical data may include, but is not limited to: load forecast error, load distribution error, loop flow impacts, variations in generation dispatch. A study of the transmission system may be substituted for the historical data if large simultaneous path interactions are the reason a larger amount is used.

R1.2. Each Transmission Service Provider will define and document the MW amounts of transfer capability (on interfaces) or facility ratings (of facilities used as limits in ATC

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Deleted: To promote the consistent application of transmission Transfer Capability margin calculations among Transmission Service Providers and Transmission Owners, each Regional Reliability Organization shall develop a methodology for calculating Transmission Reliability Margin (TRM). This methodology shall comply with the NERC definition for TRM, the NERC Reliability Standards, and applicable Regional criteria.

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calculations) set aside as the generation reserve sharing component of the Transmission Reliability Margin.

R1.2.1. The Transmission Service Provider will include in its documentation, the methodology describing how the amounts are defined and a copy of the study in which the current amounts are calculated.

R1.2.2. If the amount is zero or the Transmission Service Provider does not participate in generation reserve sharing, all that is needed is a statement reflecting this in the documentation.

R2. The Transmission Service Provider will, at a minimum, review its Transmission Reliability Margin quarterly and update any required studies or explanations required in its documentation at that time.

R3. The Transmission Service Provider will document the amount of Transmission Reliability Margin that will be subtracted from the Total Transfer Capacity (TTC) on each interface. This amount is the values previously defined in R1.2, if the Transmission Service Provider chose to set a part of Transmission Reliability Margin aside as interface transfer capability.

R3.1. The Transmission Service Provider will document the amount of Transmission Reliability Margin that will be made available to the market as Non-Firm Transmission Service.

R4. The Transmission Service Provider will make available its most recent version of its Transmission Reliability Margin documentation on their OASIS website.

C. Measures

M1. The Transmission Service Provider's most recent version of the Transmission Reliability Margin documentation is available on their OASIS.

M2. The Transmission Service Provider's most recent version of the documentation contains all items in Reliability Standard MOD-008-1_R1.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

Each Regional Reliability Organization shall report compliance and violations to NERC via the NERC Compliance Reporting process.

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: The Regional Reliability Organization's documented TRM methodology does not address one of the five items required for documentation under Reliability Standard MOD-008-0_R1.

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Deleted: <#>Each Regional Reliability Organization, in conjunction with its members, shall develop and document a Regional TRM methodology. The Region's TRM methodology shall specify or describe each of the following five items, and shall explain its use, if any, in determining TRM values. Other items that are Region-specific or that are considered in each respective Regional methodology shall also be explained along with their use in determining TRM values.¶
<#>Specify the update frequency of TRM calculations.¶
<#>Specify how TRM values are incorporated into Available Transfer Capability calculations.¶
<#>Specify the uncertainties accounted for in TRM and the methods used to determine their impacts on the TRM values. Any component of uncertainty, other than those identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, shall benefit the interconnected transmission systems as a whole before they shall be permitted to be included in TRM calculations. The components of uncertainty identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, if applied, shall be accounted for solely in TRM and not CBM. ¶
<#>Aggregate Load forecast error (not included in determining generation reliability requirements). ¶
<#>Load distribution error.¶
<#>Variations in facility Loadings due to balancing of generation within a Balancing Authority Area.¶
<#>Forecast uncertainty in transm ... [1]

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2.2. Level 2: Not applicable.

2.3. Level 3: Not applicable.

2.4. Level 4: The Regional Reliability Organization's documented TRM methodology does not address two or more of the five items required for documentation under Reliability Standard MOD-008-0_R1.

Or

The Regional Reliability Organization does not have a documented TRM methodology.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

Each Regional Reliability Organization, in conjunction with its members, shall develop and document a Regional TRM methodology. The Region's TRM methodology shall specify or describe each of the following five items, and shall explain its use, if any, in determining TRM values. Other items that are Region-specific or that are considered in each respective Regional methodology shall also be explained along with their use in determining TRM values.

Specify the update frequency of TRM calculations.

Specify how TRM values are incorporated into Available Transfer Capability calculations.

Specify the uncertainties accounted for in TRM and the methods used to determine their impacts on the TRM values. Any component of uncertainty, other than those identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, shall benefit the interconnected transmission systems as a whole before they shall be permitted to be included in TRM calculations. The components of uncertainty identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, if applied, shall be accounted for solely in TRM and not CBM.

Aggregate Load forecast error (not included in determining generation reliability requirements).

Load distribution error.

Variations in facility Loadings due to balancing of generation within a Balancing Authority Area.

Forecast uncertainty in transmission system topology.

Allowances for parallel path (loop flow) impacts.

Allowances for simultaneous path interactions.

Variations in generation dispatch.

Short-term System Operator response (Operating Reserve actions not exceeding a 59-minute window).

Describe the conditions, if any, under which TRM may be available to the market as Non-Firm Transmission Service.

Describe the formal process for the Regional Reliability Organization to grant any variances to individual Transmission Service Providers from the Regional TRM methodology.

The Regional Reliability Organization shall make its most recent version of the documentation of its TRM methodology available on a web site accessible by NERC, the Regional Reliability Organizations, and transmission users.

A. Introduction

1. **Title:** **Procedure for Verifying Transmission Reliability Margin Values**

2. **Number:** MOD-009-0 - This will likely be recommended for deletion, since it is mostly a requirement for compliance monitoring by the Regional Entities. A few of the requirements will be moved to MOD-008-1.

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3. **Purpose:** To promote the consistent application of transmission Transfer Capability margin calculations among Transmission System Providers and Transmission Owners.

4. **Applicability:**

   4.1. Regional Reliability Organization

5. **Effective Date:** April 1, 2005

B. Requirements

R1. Each Regional Reliability Organization, in conjunction with its members, shall develop and implement a procedure to review Transmission Reliability Margin (TRM) calculations and resulting values of member Transmission Service Providers to ensure they comply with the Regional TRM methodology, and are periodically updated and available to transmission users. This procedure shall include the following four required elements:

R1.1. Indicate the frequency under which the verification review shall be implemented.

R1.2. Require review of the process by which TRM values are updated, and their frequency of update, to ensure that the most current TRM values are available to transmission users.

R1.3. Require review of the consistency of the Transmission Service Provider's TRM components with its published planning criteria. A TRM value is considered consistent with published planning criteria if the same components that comprise TRM are also addressed in the planning criteria. The methodology used to determine and apply TRM does not have to involve the same mechanics as the planning process, but the same uncertainties must be considered and any simplifying assumption explained.

R1.4. Require TRM values to be periodically updated (at least prior to each season — winter, spring, summer, and fall), as necessary, and made available to the Regional Reliability Organizations, NERC, and transmission users.

R2. The Regional Reliability Organization shall make documentation of its Regional TRM review procedure available to NERC on request (within 30 calendar days).

R3. The Regional Reliability Organization shall make documentation of the results of the most current implementation of its TRM review procedure available to NERC on request (within 30 calendar days).

C. Measures

M1. The Regional Reliability Organization shall have evidence that it provided to NERC upon request (within 30 calendar days) a copy of its written procedure developed for the performance of periodic reviews of Regional TRM calculations.

M2. The Regional Reliability Organization shall have evidence it provided to NERC on request (within 30 calendar days) documentation of the results of the most current implementation of its TRM review procedure.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

Each Regional Reliability Organization shall report compliance and violations to NERC via the NERC Compliance Reporting process.

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: Not applicable.

2.2. Level 2: The Regional Reliability Organization did not perform an annual review of all Transmission Service Providers within its Region for consistency with its Regional TRM methodology.

2.3. Level 3: Not applicable.

2.4. Level 4: The Regional Reliability Organization does not have a procedure for performing a TRM methodology consistency review of all Transmission Service Providers within its Region, or has not performed any such annual reviews.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

Attachment 4c1

Standard MOD-008-0 — Documentation and Content of Each Regional TRM Methodology

A. Introduction

1. **Title:** Calculation and **Documentation of Transmission Reliability Margin**
2. **Number:** MOD-008-0
3. **Purpose:** To promote the consistent calculation and documentation of each Transmission Service Provider's Transmission Reliability Margin
4. **Applicability:**
   - **4.1.** Transmission Service Provider
5. **Effective Date:**

B. Requirements

R1. Transmission Reliability Margin consists of two components, the uncertainty component and the generation reserve sharing component. The uncertainty component will by definition be zero. Only the generation reserve sharing component may be a non-zero quantity for the TRM calculation.

R1.1.

R1.2. Each Transmission Service Provider will define and document the MW amounts of transfer capability (on interfaces) or facility ratings (of facilities used as limits in ATC calculations) set aside as the generation reserve sharing component of the Transmission Reliability Margin.

R1.3.1. The Transmission Service Provider will include in its documentation, the methodology describing how the amounts are defined and a copy of the study in which the current amounts are calculated.

R1.3.2. If the amount is zero or the Transmission Service Provider does not participate in generation reserve sharing, all that is needed is a statement reflecting this in the documentation.

R1.3. The Transmission Service Provider will, at a minimum, review its Transmission Reliability Margin quarterly and update any required studies or explanations required in its documentation at that time.

R1.4. The Transmission Service Provider will document the amount of Transmission Reliability Margin that will be subtracted from the Total Transfer Capacity (TTC) on each interface. This amount is the values previously defined in R1.2, if the Transmission Service Provider chose to set a part of Transmission Reliability Margin aside as interface transfer capability.

R1.5. The Transmission Service Provider will document the amount of Transmission Reliability Margin that will be made available to the market as Non-Firm Transmission Service.

R1.6. The Transmission Service Provider will make available its most recent version of its Transmission Reliability Margin documentation on their OASIS website.

C. Measures

Deleted: and Content

Deleted: Each Regional

Deleted: Methodology

Deleted: To promote the consistent application of transmission Transfer Capability margin calculations among Transmission Service Providers and Transmission Owners, each Regional Reliability Organization shall develop a methodology for calculating Transmission Reliability Margin (TRM). This methodology shall comply with the NERC definition for TRM, the NERC Reliability Standards, and applicable Regional criteria.

Deleted: Regional Reliability Organization

Deleted: April 1, 2005

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Deleted: Each Transmission Service Provider must define, within the limits of the standard, and document an amount set aside to make up each component of the Transmission Reliability Margin.

Deleted: Each Transmission Service Provider will define a percentage of transmission element facility ratings (of facilities used as limits in ATC calculations) as the uncertainty component of the Transmission Reliability Margin. Each element or groups of elements may have different percentages set aside as long as it is clear in the documentation what percentage is set aside for each element or group of

Deleted: elements

Deleted: The uncertainty component of TRM will be zero unless a non-zero value can be justified through historical evidence or some yet to be defined method based on good utility practice.

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Deleted: <#>If the percentage defined for a specific element or group of elements, used as limits in ATC calculations, is between 0% and 2%, then the Transmission Service Provider must provide an explanation in its documentation why that percentage is used.¶
<#>If a percentage defined for a s... [1]

Deleted: <#>Each Regional Reliability Organization, in conjunction with its members, shall develop and docur... [2]

Deleted: <#>Describe the formal process for the Regional Reliability Organization to grant any variance... [3]

Deleted: <#>¶

M1. The Transmission Service Provider's most recent version of the Transmission Reliability Margin documentation is available on their OASIS.

M2. The Transmission Service Provider's most recent version of the documentation contains all items in Reliability Standard MOD-008-1_R1.

The following requirements were extracted from MOD-009 – unsure how to integrate them into this standard.

R2.1. Indicate the frequency under which the verification review shall be implemented.

Put in MOD-008

R2.2. Require review of the process by which TRM values are updated, and their frequency of update, to ensure that the most current TRM values are available to transmission users.

Put in MOD-008

R2.3. Require review of the consistency of the Transmission Service Provider's TRM components with its published planning criteria. A TRM value is considered consistent with published planning criteria if the same components that comprise TRM are also addressed in the planning criteria. The methodology used to determine and apply TRM does not have to involve the same mechanics as the planning process, but the same uncertainties must be considered and any simplifying assumption explained.

Put in MOD-008

R2.4. Require TRM values to be periodically updated (at least prior to each season — winter, spring, summer, and fall), as necessary, and made available to the Regional Reliability Organizations, NERC, and transmission users. See R1.3

Put in MOD-008

R3. The TSP shall make documentation of the results of the most current implementation of its TRM review procedure available to NERC on request (within 30 calendar days).

Put in MOD-008

Deleted: The Regional Reliability Organization's

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D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

Each Regional Reliability Organization shall report compliance and violations to NERC via the NERC Compliance Reporting process.

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: The Regional Reliability Organization's documented TRM methodology does not address one of the five items required for documentation under Reliability Standard MOD-008-0_R1.

2.2. Level 2: Not applicable.

2.3. Level 3: Not applicable.

2.4. Level 4: The Regional Reliability Organization's documented TRM methodology does not address two or more of the five items required for documentation under Reliability Standard MOD-008-0_R1.

Or

The Regional Reliability Organization does not have a documented TRM methodology.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

Page 1: [1] Deleted **Chuck Falls** **1/22/2007 4:08:00 PM**

If the percentage defined for a specific element or group of elements, used as limits in ATC calculations, is between 0% and 2%, then the Transmission Service Provider must provide an explanation in its documentation why that percentage is used.

If a percentage defined for a specific transmission element or group of elements is greater than 5% then the Transmission Service Provider must provide in its documentation an explanation of why the higher percentage is need and historical data that reinforces the explanation. The historical data may include, but is not limited to: load forecast error, load distribution error, loop flow impacts, variations in generation dispatch. A study of the transmission system may be substituted for the historical data if large simultaneous path interactions are the reason a larger amount is used.

Page 1: [2] Deleted **Nate Schweighart** **12/15/2006 9:17:00 AM**

Each Regional Reliability Organization, in conjunction with its members, shall develop and document a Regional TRM methodology. The Region's TRM methodology shall specify or describe each of the following five items, and shall explain its use, if any, in determining TRM values. Other items that are Region-specific or that are considered in each respective Regional methodology shall also be explained along with their use in determining TRM values.

Specify the update frequency of TRM calculations.

Specify how TRM values are incorporated into Available Transfer Capability calculations.

Specify the uncertainties accounted for in TRM and the methods used to determine their impacts on the TRM values. Any component of uncertainty, other than those identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, shall benefit the interconnected transmission systems as a whole before they shall be permitted to be included in TRM calculations. The components of uncertainty identified in MOD-008-0_R1.3.1 through MOD-008-0_R1.3.7, if applied, shall be accounted for solely in TRM and not CBM.

Aggregate Load forecast error (not included in determining generation reliability requirements).

Load distribution error.

Variations in facility Loadings due to balancing of generation within a Balancing Authority Area.

Forecast uncertainty in transmission system topology.

Allowances for parallel path (loop flow) impacts.

Allowances for simultaneous path interactions.

Variations in generation dispatch.

Short-term System Operator response (Operating Reserve actions not exceeding a 59-minute window).

Describe the conditions, if any, under which TRM may be available to the market as Non-Firm Transmission Service.

Page 1: [3] Deleted **Charles Z Falls** **1/30/2007 1:52:00 PM**

Describe the formal process for the Regional Reliability Organization to grant any variances to individual Transmission Service Providers from the Regional TRM methodology.

The Regional Reliability Organization shall make its most recent version of the documentation of its TRM methodology available on a web site accessible by NERC, the Regional Reliability Organizations, and transmission users.

Attachment 4c2

Standard MOD-008-1 — TRM Calculation Methodology

A. Introduction

1 **Title:** Transmission Reliability Margin Calculation Methodology

2 **Number:** MOD-008-1

3 **Purpose:** To promote the consistent Transmission Reliability Margin calculation methodologies among Transmission Service Providers.

4. Applicability:

4.1. Transmission Service Providers

5 Effective Date: xxxxxx

B. Requirements

R1. Transmission Service Providers are not required to use Transmission Reliability Margin in calculation of ATCs or AFCs. If they use Transmission Reliability Margin, they must account for the following uncertainties as applicable:

R1.1. Aggregate Load forecast error (not included in determining generation reliability requirements).

R1.2. Load distribution error.

R1.3 Variations in facility Loadings due to balancing of generation within a Balancing Authority Area.

R1.4 Forecast uncertainty in transmission system topology.

R1.5 Allowances for parallel path (loop flow) impacts.

R1.6 Allowances for simultaneous path interactions.

R1.7 Variations in generation dispatch.

R1.8 Short-term System Operator response (Operating Reserve actions not exceeding a 59-minute window).

R2. Transmission Provider shall separately calculate TRM for each of the uncertainty included in R1.1 – R1.8 for various time horizons (use these time horizons from ATC/AFC calculations) on each Posted Contract Path or Flowgate.

R3 Transmission Provider shall use the largest of the TRM value calculated in R2 in ATC/AFC calculations. If Transmission Service Provider uses a value larger than the largest value for each of the uncertainty or it uses any other uncertainty to determine TRM values, it must justify the use of such value.

R4 Transmission Provider shall determine TRM values at least once a year and update them for use in ATC/AFC calculations.

R5 Transmission Service Provider shall document the procedure used to determine TRM values for each or the uncertainty included in R1.1 through 1.8.

R6 Transmission Service Provider shall post TRM calculation procedure on a publicly accessible web site..

C. Measures

M1. Transmission Service Provider shall document which uncertainties it is using to determine TRM values.

M2. Transmission Service Provider shall have evidence that it has determined TRM values for various time horizons using its documented procedures.

M3 Transmission Service Provider shall have evidence that it has posted its TRM methodology on publicly accessible web site.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: ERO.

1.2. Compliance Monitoring Period and Reset Timeframe

xxxxxx

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: xxxxx

2.2. Level 2: xxxxxx.

2.3. Level 3: xxxxx.

2.4. Level 4: xxxx

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

Attachment 4d1

Midwest ISO TRM Calculation Methodology

Definition

Transmission Reliability Margin (TRM) is 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 operations as system conditions change.

Concept

The Midwest ISO uses a flowgate AFC methodology. Discrete TRM values in MWs are determined for each flowgate. Midwest ISO also employs TRM coefficients in its non-firm AFC calculations. The coefficients determine the amount of TRM that will be applied to non-firm AFCs in the operating horizon[1] ("b" coefficient) and in the planning horizon ("a" coefficient). These coefficients are applied as multipliers to the TRM value. The value of these coefficients (between zero and one) must be documented in the flowgate definition data.

The Midwest ISO administers an Open Access Transmission and Energy Markets Tariff (TEMT) that provides point-to-point (PTP) and network integrated transmission service (NITS). TRM is being used to reserve transmission capacity in the operating horizon and in the planning horizon for uncertainty in system conditions modeled in the AFC calculation and for automatic reserve sharing (ARS). During an ARS event, emergency replacement energy schedules are implemented across non-market members of the Midwest Contingency Reserve Sharing Group, and from the Midwest ISO market for market member Balancing Authorities, immediately upon notification of an ARS triggering event. The reserve sharing component of TRM provides reasonable assurance that transmission capacity is available to accommodate the operation of contingency reserve sharing. TRM will be decremented on all Midwest ISO flowgates where a margin is found to be needed. the Midwest ISO Available Flowgate Capability document describes the use of TRM for selling of transmission service.

The Midwest ISO will include TRM in its transmission planning process such that the transmission system is being expanded to accommodate the existence of TRM. The Midwest ISO sub-regional transmission plans are developed at the local level by Transmission Owners and other entities in coordination with the Midwest ISO. The local plans build to an overall Midwest ISO plan. the Midwest ISO will work with the local planning groups to ensure a proper amount of TRM is being retained on Midwest ISO flowgates.

[1] The Operating Horizon is defined to be the next 48 hours of operation. The Planning Horizon is defined to be the time beyond the Operating Horizon.

the Midwest ISO operates as a single Transmission Provider for the Midwest ISO footprint. As a single Transmission Provider, the Midwest ISO does not anticipate variances from the TRM calculation methodology occurring.

TRM Components

The following components are included in Midwest ISO's TRM:

Uncertainty Component

Modeling assumptions in AFC calculations can contribute to inaccuracies. The uncertainty component is applicable only in the planning horizon of the AFC calculations. The uncertainty is not applicable in the operating horizon since the AFC calculations are based on real-time data and the uncertainty factors negligible.

The following inaccuracies are addressed by a factor of 2% of the flowgate rating.

- Real-time facility loading can be higher than predicted due to unaccounted parallel path flows resulting from schedule transfers by other entities. the Midwest ISO attempts to account for all parallel path flows by utilizing NERC schedules and OASIS transmission reservations. Parallel path flows that are not captured through this process are part of this uncertainty component.
- Load forecast error and load distribution variability can contribute to an increase in real-time facility loading above predicted values. The Midwest ISO supplements the short-term load forecast from the Balancing Authorities with its own forecast. The Midwest ISO uses snapshots off the real-system to update its load profile. Both of these actions are designed to minimize unknown flows.
- Variations in the generation dispatch and network topology can contribute to uncertainty in the AFC calculation. Market dispatch can vary from predicted levels based on economic and congestion factors.

Reserve Sharing Component

The reserve sharing component of TRM is the MW amount required to deliver contingency reserves. The reserve sharing component is calculated by determining the response of the generators within the contingency reserve pool for the worst case loss of generation on a given transmission facility. All generators internal to the Midwest ISO will be included in this analysis. the Midwest ISO will depend on the expertise of Transmission Owners to determine

which external generators will be included. The reserve sharing component of TRM will be determined on a seasonal basis (summer and winter).

The reserve sharing component is applicable to both the operating and planning horizons of the AFC calculations.

Stability Limited Flowgates

Stability limited flowgates will have a stability component within TRM to reflect changing transfer limits as system conditions change. The same TTC (flowgate rating) value is used for both firm and non-firm transmission capability at any point in time. Because of path interdependencies[2], dynamic line ratings, peak and off-peak variations, and other conditions differing from those studied, a flowgate may have different amounts of transfer capability for firm use than for non-firm use.

Transient stability limits, voltage stability limits and phase angle limits can be identified in advance by performing studies to determine transfer capability for different system conditions including simultaneous and non-simultaneous transfer level. For interdependent flowgates, the difference between maximum allowable flows developed using simultaneous and non-simultaneous study procedures and the related interdependency of flowgates may be handled by computing a variable TRM. The TTC of these flowgates are held fixed and the TRM is allowed to vary on an hourly and daily basis to reflect reductions in transfer capability as topology changes.

Excessive Congestion

Flowgates that experience an excessive level of congestion may be subjected to additional TRM to reduce future congestion. The Transmission Owner may petition the Midwest ISO for additional TRM (beyond the uncertainty, reserve sharing, and stability components) or the Midwest ISO may identify the need for additional TRM. The Midwest ISO will review these requests and will make a determination whether to increase the uncertainty component or TRM under these circumstances and announce their decision at the open meeting of the AFCWG.

Sale of TRM

Sale of the reserve sharing component of TRM on a recallable firm basis will be allowed in the operating horizon to avoid curtailing firm load as demonstrated by declaring an EEA2. The TRM will be recalled when needed for reserve sharing.

References

1. **The Midwest ISO AFC Methodology Document**
2. **The Midwest Contingency Reserve Sharing Group Charter**

[2] For further information on interdependent paths, please see the AFC methodology document.

Attachment 4d2

TBM and CBM Values Updated Dec 31st 2006

Sr. No	OASIS Pathcode	Winter Rating	Winter TRM	Winter CBM	Summer Rating	Summer TRM	Summer CBM	TRM FACTOR A	TRM FACTOR B
1	11M20MBNNALC	167	8.35	0	135	6.75	0	0	0.0000
2	11M20MXFPTDF	167	8.35	0	135	6.75	0	0	0.0000
3	471NELCORNEL	1800	36	0	1721	34.42	0	1	1.0000
4	526TILBALWMV	287	46.34	0	287	46.34	0	1	0.8761
5	526TILWMVEWF	287	46.34	0	287	46.34	0	1	0.8761
6	8STKERARNHAZ	223	4.46	0	200	4	0	0	0.0000
7	8STKERWEMPAD	223	4.46	0	200	4	0	0	0.0000
8	ABBHEN__PTDF	224	0	37	218	0	37	1	0.5000
9	ABBHENCULGVW	224	4.8	45	224	4.4	45	0	0.0000
10	ABBNW_ABBHEN	287	31.04	14.96	287	31.04	16.2	1	0.8151
11	ABNCROWMVEWF	287	26.44	0	264	25.98	0	1	0.7968
12	ABNXFM__PTDF	478	29.86	0	478	29.86	0	1	0.6798
13	ABNXFMBRECAS	478	9.56	0	478	9.56	0	1	0.0000
14	ABNXFMDUMWIL	478	9.56	0	478	9.56	0	1	0.0000
15	ABNXFMGIBPET	478	9.56	0	478	9.56	0	1	0.0000
16	ADKBTY__PTDF	1386	52	0	1042	52	0	1	1.0000
17	ADKBTYKILMRQ	1434	64	0	1279	64	0	1	1.0000
18	ADMXFMHAZADM	300	27.8	0	357	28.94	0	1	0.7533
19	ADNZIO__PTDF	1255	25.1	0	1096	21.92	0	1	0.0000
20	ADNZIOPLPZIO	1434	28.68	0	1096	21.92	0	1	0.0000
21	ADSHAEGHEWLX	143	0	0	143	0	0	0	0.0000
22	ALBCRONEWXEN	287	26.44	0	264	25.98	0	1	0.7968
23	ALBGARQUAH47	215	6	17	215	6	17	1	0.8000
24	ALBPRS__PTDF	272	14.04	0	211	12.82	0	1	0.6708
25	ALBPRSWEMPAD	322	6.44	0	279	5.58	0	1	0.0000
26	ALBPRSWEMROE	322	6.44	0	279	5.58	0	1	0.0000
27	ALCELH__PTDF	236	4.72	0	189	3.78	0	0	0.0000
28	ALNLULBAYMON	1609	32.18	0	1609	32.18	0	1	0.0000
29	ALNXFMMONBAY	1024	38.48	41.4	890	35.8	41.4	1	0.5028
30	AMEBJCMTZBON	100	2	0	75	1.5	0	0	0.0000
31	ANTJFR__PTDF	2165	135	25	2165	135	25	0	0.0000
32	ARCGVL__PTDF	1255	25.1	0	1096	21.92	0	1	0.0000
33	ARCSTEMARXFM	191	53.72	0	191	53.72	0	1	0.9289
34	ARCSTEPCKCHK	191	53.72	0	191	53.72	0	1	0.9289
35	ARCSTEPCKWFR	191	53.72	0	191	53.72	0	1	0.9289
36	ARCSTEWMVEWF	191	53.72	0	191	53.72	0	1	0.9289
37	ARGBAT__PTDF	1525	98.2	0	1242	92.54	0	1	0.7316
38	ARGBATARGTOM	1525	30.5	0	1242	24.84	0	1	0.0000
39	ARGMRWARGBTL	335	10.3	7	330	10.2	7	1	0.3529
40	ARNHAZ__PTDF	717	100.54	0	717	100.54	0	1	0.8574
41	ARNHAZDORFOR	717	14.34	0	717	14.34	0	0	0.0000
42	ARNHAZMTZBON	717	14.34	0	717	14.34	0	0	0.0000
43	ARNHAZWEMPAD	717	14.34	0	717	14.34	0	1	0.0000
44	ARNVINARNHAZ	335	21.2	0	276	20.02	0	1	0.7243
45	ASBERWSAMWYL	1792	0	0	1792	0	0	0	0.0000
46	ATJATATHTJWL	235	36.4	0	235	36.4	0	1	0.8709
47	AVNLDN__PTDF	287	26.14	0	224	25.92	0.12	1	0.7864
48	AVNLDNGHEWLX	287	14.35	0	287	14.35	0	1	0.0000

49	AVNXFM__PTDF	574	28.7	0	434	21.7	0	1	0.0000
50	AVNXFMBAKBRO	621	31.05	0	536	26.8	0	1	0.0000
51	AVOBE1AVOBE2	1153	85.86	0	1030	83.4	0	1	0.7530
52	AXTDANJFRANT	459	37	0	408	37	0	0	0.0000
53	AXTXFMJFRANT	981	82	0	906	82	0	0	0.0000
54	AXTXFMJFRCLV	981	82	0	906	82	0	0	0.0000
55	BALCAH__PTDF	1673	87.86	0	1297	80.34	0	1	0.6771
56	BALCAHBALSTA	1793	35.86	0	1684	33.68	0	1	0.0000
57	BALCAHCOFROX	1793	35.86	0	1684	33.68	0	1	0.0000
58	BALCAHSTAROX	1793	35.86	0	1684	33.68	0	1	0.0000
59	BAYFOSLEMFOS	1076	51.12	0	1076	51.12	0	1	0.5790
60	BAYMON__PTDF	1793	316.66	0	1536	311.52	0	1	0.9014
61	BAYMONDBELEM	1793	35.86	0	1536	30.72	0	1	0.0000
62	BAYMONLEMMAJ	1793	35.86	0	1536	30.72	0	1	0.0000
63	BAYMONLUL3TM	1793	35.86	0	1536	30.72	0	1	0.0000
64	BAYTOUDBEBEA	326	34.12	0	286	33.32	0	1	0.8283
65	BAYXFM__PTDF	903	25.46	42.9	740	22.2	42.9	1	0.3333
66	BAYXFMLUL3TM	903	18.06	42.9	740	14.8	42.9	1	0.0000
67	BDFSEYBDFCLM	225	4.5	0	179	3.58	0	1	0.0000
68	BDRBPNNAPRRN	156	28.72	0	122	30.24	0	1	0.0000
69	BDRXFMNAPRRN	143	28.46	0	143	30.66	0	1	0.0000
70	BEABROBEADBE	188	9.06	0	132	7.94	0	1	0.6675
71	BEADBE__PTDF	1153	262.06	0	1030	259.6	0	1	0.9206
72	BEADBEGALFOS	1153	23.06	0	1030	20.6	0	1	0.0000
73	BEDCLRGOOLOC	459	9.18	42.9	445	8.9	42.9	1	1.0000
74	BEDDOUPRNMTS	2598	130	43	2598	130	85	0	0.0000
75	BELPLVCHESIL	430	2	0	445	2	0	0	0.0000
76	BLAFRA__PTDF	1377	57.14	0	1072	51.04	0	1	0.5799
77	BLAFRALUTESX	1523	30.46	0	1273	25.46	0	1	0.0000
78	BLAFRAMCROVE	1523	30.46	0	1273	25.46	0	1	0.0000
79	BLAFRASTFLUT	1523	30.46	0	1273	25.46	0	1	0.0000
80	BLKCORPADTLR	393	19.86	0	403	20.06	0	1	0.5982
81	BLKCRDWEMROE	393	7.86	0	403	8.06	0	1	0.0000
82	BLLVOL__PTDF	2598	129.9	0	2598	129.9	0	0	0.0000
83	BLLVOLWBNVOL	2598	129.9	103	2598	129.9	103	0	0.0000
84	BLMDENBEDCOL	478	19.86	0	478	19.86	0	1	0.5186
85	BLOBEDPRNMTS	2914	145.7	69	2744	137.2	138	0	0.0000
86	BLUBUL__PTDF	334	13.25	0	233	11.65	0	1	1.2446
87	BLUBULBAKBRO	334	16.7	0	233	11.65	0	1	0.0000
88	BLUBULCDNWYO	334	5.3	0	233	4.66	0	1	0.0000
89	BLUBULGHEWLX	334	16.7	0	233	11.65	0	1	0.0000
90	BLUBULTRMCLF	334	5.58	0	233	4.66	0	1	0.0000
91	BLUXFMBAKBRO	318	19.22	0	276	19.22	0	1	0.0000
92	BMTXFM__PTDF	2196	110	0	1887	94	0	0	0.0000
93	BMTXFMKAMXFM	2910	262	15	2466	262	15	0	0.0000
94	BNNALC__PTDF	956	52.8	0	956	52.8	0	0	0.0000
95	BOKXFMBOKLSB	336	0	0	336	0	0	0	0.0000
96	BONBJCLEHWBS	223	4.46	0	178	3.56	0	0	0.0000
97	BONBJCSYCLEH	223	4.46	0	178	3.56	0	0	0.0000
98	BRECAS__PTDF	1538	212.46	0	1224	206.18	0	1	0.8813
99	BRECASROCJEF	1662	33.24	0	1347	26.94	0	1	0.0000
100	BREDARROCJEF	1273	90	0	1000	90	0	0	0.0000

101	BREWHEJEFROC	956	19.12	0	956	19.12	0	0	0.0000
102	BRIKEYRIVRED	191	31	0	191	31	0	0	0.0000
103	BRKCLAVALPIT	107	13	0	107	13	0	0	0.0000
104	BRNFWK__PTDF	214	33.7	0	179	32.48	0	1	0.8909
105	BROHOWBEADBE	205	13.2	0	173	12.56	0	1	0.7245
106	BROXFMBROJFR	2100	173	0	1920	173	0	0	0.0000
107	BRYMSH__PTDF	335	0	7	265	0	7	0	0.0000
108	BTHPAL__PTDF	1807	251	0	1452	246	0	1	0.8492
109	BTHPALCOOPAL	2094	188	0	1830	188	0	1	0.0000
110	BTHPALTWBARG	2094	188	0	1830	188	0	1	0.0000
111	BTRGVLARCGVL	406	8.12	0	332	6.64	23	1	0.0000
112	BUCLWD____IN	3000	0	0	3000	0	0	0	0.0000
113	BUCLWD__NEIN	1000	0	0	1000	0	0	0	0.0000
114	BUFBNE__PTDF	331	17	0	301	16	0	0	0.0000
115	BUFDBN__PTDF	956	0	0	956	0	0	0	0.0000
116	BUFPIE__PTDF	956	0	0	956	0	0	0	0.0000
117	BUFXFMPIEFST	559	59.18	0	559.1	59.182	0	1	0.8111
118	BUKMIDTRMMID	1195	18.52	0	926	18.52	0	0	0.0000
119	BUNXFMCASSID	300	51.4	0	300	51.4	11.56	1	0.8833
120	BURMUN__PTDF	1195	85	0	1195	85	0	1	0.7188
121	BURMUNWILD_G	1195	23.9	0	1195	23.9	0	1	0.0000
122	BURMUNWILDUM	1195	23.9	0	1195	23.9	0	1	0.0000
123	BURSHE__PTDF	1195	82.1	0	1195	82.1	0	1	0.7089
124	BURSHEDUMWIL	1195	23.9	0	1195	23.9	0	1	0.0000
125	BVAHANMANCHA	1195	104.4	0	1195	104.4	0	1	0.7711
126	BVASAM__PTDF	1778	257.56	0	1732	256.64	0	1	0.8650
127	BVASAMBVAHAN	1778	35.56	145.8	1732	34.64	145.8	1	0.0000
128	BVSNBVNESDEL	237	44	0	235	44	0	0	0.0000
129	BYCH_BBYNWEM	1530	31	0	1530	31	0	0	0.0000
130	BYCH_RBYNWEM	1530	31	0	1530	31	0	0	0.0000
131	BYNCHEBYNCHE	1530	31	0	1530	31	0	0	0.0000
132	BYRCHEBYRCHE	1799	36	0	1530	31	0	1	1.0000
133	CA1LMT__PTDF	204	60.48	0	159	59.58	0	1	0.9466
134	CA1LMTCA3M23	215	4.3	0	174	3.48	0	1	0.0000
135	CA3DPFRSFXFM	287	33.24	0	280	33.1	0	1	0.8308
136	CAHGRTCAHCEN	453	28.76	0	421	28.12	0	1	0.7006
137	CAHXF8__PTDF	700	42.8	0	700	42.8	0	1	0.6729
138	CAMMALCAMMAL	287	58.94	0	285	58.9	0	1	0.9032
139	CAPJOP__PTDF	321	11.62	15	250	10.2	18	1	0.5098
140	CAPJOPJOPBYP	335	6.7	9.8	297	5.94	12.8	1	0.0000
141	CAPJOPSHAJOP	335	6.7	8.8	297	5.94	10.8	1	0.0000
142	CATXFRCATXFR	243	31	0	243	31	0	0	0.0000
143	CAYNUC__PTDF	1793	90.76	0	1386	82.62	0	1	0.6645
144	CAYNUCCAYEUG	1793	35.86	0	1386	27.72	0	1	0.0000
145	CAYNUCWHEAMO	1793	49.3	0	1386	49.3	0	0	0.0000
146	CAYVDBCAYFRK	478	17.36	0	478	17.36	0	1	0.4493
147	CAYX10__PTDF	548.5	10.97	0	441	8.82	0	0	0.0000
148	CCTCOCCOCSON	460	10	0	430	9.4	0	0	0.0000
149	CCTSONCOCSON	451	9.21	0	430	8.79	0	0	0.0000
150	CDVNELQUA471	1799	36	0	1530	31	0	0	0.0000
151	CENCEE__PTDF	287	43.84	37.26	236	42.82	49.26	1	0.8898
152	CHAHAR__PTDF	1793	212.26	0	1793	212.26	0	1	0.8311

153	CHAHARSTAJUN	1793	35.86	56.5	1793	35.86	56.5	1	0.0000
154	CHEBELCHESIL	506	25	0	506	25	0	1	1.0000
155	CHESILNELELC	1530	31	0	1530	31	0	0	0.0000
156	CLAQUEMERQUE	214	36.98	39.91	214	36.98	34.67	1	0.8843
157	CLFCARBAKBRO	210	55.5	0	210	55.5	0	0	0.0000
158	CLFDBNJEFGRN	1100	55	0	1100	55	0	0	0.0000
159	CLFNSI__PTDF	133	0	0	113	0	0	0	0.0000
160	CLFNSICLFTRM	162	13.56	0	113	13.16	0	0	0.0000
161	CLFTRM__PTDF	1195	351	0	1195	351	0	1	0.9311
162	CLKXFMBLAFRK	287	16.94	0	287	16.94	0	1	0.6612
163	CLOHALCLOCSN	880	20	0	767	20	0	1	1.0000
164	CLOXFMWAKCSN	1155	58	96	1000	50	96	0	0.0000
165	CLVLEX__PTDF	1950	0.05	0	1764	76.5	0	0	0.0000
166	CLVLEXMTSVAL	1950	150	0	1764	150	0	0	0.0000
167	CLVLEXPRNMTS	1950	150	0	1764	150	0	0	0.0000
168	CMHCMT__PTDF	272	25.14	0	245	24.6	0	1	0.8008
169	CMNNAL__PTDF	335	3	0	265	3	0	0	0.0000
170	CMNNALWLSGRV	335	5	0	265	5	0	0	0.0000
171	CMTCMH__PTDF	272	27.14	39.2	245	26.6	39.98	1	0.8158
172	COCCCTCOCSON	460	10	0	430	9.4	0	0	0.0000
173	COCSONCCTCOC	478	9.71	0	430	8.75	0	0	0.0000
174	COFPAN__PTDF	956	171.82	0	956	171.82	0	1	0.8887
175	COFPANCOFCFN	956	19.12	0	956	19.12	0	0	0.0000
176	COFPANDUMWIL	956	19.12	0	956	19.12	0	1	0.0000
177	COFRXF__PTDF	1195	190.2	0	998	186.26	0	1	0.8928
178	COFRXFCFNCOF	1195	23.9	0	1195	23.9	0	1	0.0000
179	COFRXFNEWXEN	1195	23.9	0	1195	23.9	0	1	0.0000
180	COFRXFROCJEF	1195	23.9	0	1195	23.9	0	1	0.0000
181	CONSEQ__PTDF	2598	129.9	81	2598	129.9	81	0	0.0000
182	COOBENCOOPAL	2211	175	0	1942	175	0	0	0.0000
183	COOBENTWBARG	2211	175	0	1942	175	0	0	0.0000
184	COOPAL__PTDF	2094	220.08	0	1830	214.8	0	1	0.8296
185	COOPALBENPAL	2210	44.2	0	2007	40.14	0	1	0.0000
186	COOPALCOOBEN	2094	165	0	1830	165	0	0	0.0000
187	COOPALTWBARG	2094	41.88	0	1830	36.6	0	1	0.0000
188	COOPER_S	1190	225	0	1190	225	0	1	0.3684
189	COOXFMDUMXFM	2310	208	0	2115	208	0	0	0.0000
190	CORCORSWSANA	143	25	0	143	25	0	0	0.0000
191	CORNEL471NEL	1799	35.98	0	1530	30.6	0	1	1.0000
192	CPRELH__PTDF	279	5.58	0	233	4.66	0	0	0.0000
193	CR6CRNMILPDW	370	7.4	0	370	7.4	0	0	0.0000
194	CRAASHVALLYD	278	60	0	235	60	0	0	0.0000
195	CREKILWICWOO	168	33	0	168	33	0	0	0.0000
196	CRESTJWILDUM	1195	22.82	0	1141	22.82	0	1	1.0000
197	CSVNED__PTDF	283	54.6	0	221	53.3	0	1	0.9240
198	CSVNEDWEMROE	283	5.66	0	221	4.42	0	1	0.0000
199	CUBMMHDCKT_G	277	26.84	0	277	26.84	0	1	0.7936
200	CULGVW__PTDF	287	30.24	0	287	30.24	0	1	0.8102
201	CUMDVACUMJVL	2597	129.85	54	2597	129.85	54	0	0.0000
202	CUMJVLCUMDVA	2597	129.85	19	2597	129.85	19	0	0.0000
203	CVPGRS__PTDF	262	96.64	0	223	96.64	0	0	0.0000
204	CVPHBG__PTDF	206	4.12	0	191	3.82	0	0	0.0000

205	CVPNHB__PTDF	191	1	0	191	1	0	0	0.0000
206	CVTXFMMAJMAD	700	28.8	0	654	27.88	61	1	0.5308
207	CVTXFMMONBNN	700	28.8	0	654	27.88	55	1	0.5308
208	DAVCALQUARCK	279	24.98	0	223	23.86	0	1	0.8131
209	DBEBAY__PTDF	1793	166.16	0	1793	166.16	0	1	0.7842
210	DBEBAYDBELEM	1793	35.86	0	1793	35.86	0	1	0.0000
211	DBEBEA__PTDF	1153	186.16	0	1030	183.7	0	1	0.8879
212	DBEBEAKAMSCA	1153	23.06	0	1030	20.6	0	1	0.0000
213	DBELEMDBEBAY	1793	76.76	0	1677	74.44	0	1	0.5494
214	DCKIPV__PTDF	448	118.56	0	448	118.56	0	1	0.9244
215	DELTMPARGTMP	230	11.4	0	210	11	0	1	0.6182
216	DEQWSTCAYVDB	956	30.22	0	409	19.28	0	1	0.5757
217	DIGWTR__PTDF	936	85.22	0	853	83.56	0	1	0.7958
218	DIGWTRDIGNAV	936	18.72	0	853	17.06	0	1	0.0000
219	DOUXFMDOUBRI	544	27.2	52	477	23.85	52	0	0.0000
220	DREXFMDREELW	432	8.64	0	480	9.6	0	1	1.0000
221	DRSXFMELWGDR	432	8.64	32.6	480	9.6	0	1	1.0000
222	DUAMC1DUAMC2	191	3.82	0	191	3.82	0	1	0.0000
223	DUAMC1DUMWIL	191	3.82	0	191	3.82	0	1	0.0000
224	DUAMC1OLVXFM	191	3.82	0	191	3.82	0	1	0.0000
225	DUAMC2DUAMC1	191	3.82	0	191	3.82	0	1	0.0000
226	DUAMC2OLVXFM	191	3.82	0	191	3.82	0	1	0.0000
227	DUAMC2WILDUM	191	3.82	0	191	3.82	0	1	0.0000
228	DUAMCTWILDUM	382	25.1	0	382	24.3	0	0	0.0000
229	DUMSTL__PTDF	1793	178.26	0	1598	174.36	0	1	0.8167
230	DUMSTLDUMWIL	1793	35.86	0	1598	31.96	0	1	0.0000
231	DUMSTLOLVGRA	1793	35.86	205	1598	31.96	205	1	0.0000
232	DUMXF2DUMWIL	1965	98	0	1699	85	0	0	0.0000
233	DUMXFMCOKXFM	2250	203	0	2070	203	0	0	0.0000
234	DUMXFMDUMWIL	2183	203	0	1964	203	0	0	0.0000
235	DYSWASARNHAZ	334	28.38	0	276	27.22	0	1	0.7972
236	EASJUNPERHAR	1793	40.76	0	1720	39.3	0	1	0.1247
237	EAUARP__PTDF	790	91.9	0	790	91.9	0	1	0.8281
238	EAUARPPRIBYR	1195	23.9	0	1165	23.3	0	1	0.0000
239	EAUARPWEMROE	1195	23.9	0	1165	23.3	0	1	0.0000
240	EAUARPWMPPAD	1195	23.9	0	1165	23.3	0	1	0.0000
241	EDLESFKINPON	287	5.74	0	287	5.74	0	1	0.0000
242	EFRGDB__PTDF	1398	28	102	1141	23	102	0	0.0000
243	EFRGDBEFRGDR	1452	29	0	1452	29	0	0	0.0000
244	EFRGDR__PTDF	1398	28	102	1141	23	102	0	0.0000
245	EFRGDREFRGDB	1452	29	0	1452	29	0	0	0.0000
246	ELKXFRTUCOKU	287	34	0	287	34	0	0	0.0000
247	ELNHNZNAPRRN	381	24.22	0	293	22.46	0	1	0.7391
248	ELPFARWICWDR	224	26	0	193	26	0	0	0.0000
249	ELRMITFTMRON	630	31.5	0	562	28.1	0	0	0.0000
250	ELRMITHATRON	650	32.5	0	556	27.8	0	0	0.0000
251	ELRMITSAMWYL	636	31.8	53	556	27.8	105	0	0.0000
252	ELRMITWYLCAB	630	31.5	57	562	28.1	113	0	0.0000
253	ELWGDGDREELC	1799	90	0	1530	77	0	1	1.0000
254	EMELIMEMEFYD	223	40.56	0	202	40.14	0	0	0.0000
255	EQUSQUQUEQUS	287	45.44	45.91	285	45.4	36.91	1	0.8744
256	ERESRP__PTDF	567	28	0	499	25	0	0	0.0000

257	ERWERS__PTDF	640	32	0	539	27	0	0	0.0000
258	ERWERSHOMSTO	722	36	0	640	32	0	0	0.0000
259	ERWXFMERWERS	305	15	0	285	14	0	0	0.0000
260	EUGBUNBRECAS	956	95.42	0	908	94.46	121.96	1	0.8077
261	EWNBOKOLVGRA	143	10.66	14.26	137	10.54	13.04	1	0.7400
262	EWNBOKREYXFM	143	10.66	14.26	137	10.54	13.04	1	0.7400
263	FFETYRGHEWLX	248	37.86	0	220	37.28	0	0	0.0000
264	FLWNOR__PTDF	460	94.8	0	460	94.8	0	1	0.9030
265	FLWSOU__PTDF	300	6	0	300	6	0	1	0.9429
266	FORCHS__PTDF	1785	35.7	0	1785	35.7	0	1	0.0000
267	FOSLEM__PTDF	1441	171.72	0	1288	168.66	0	1	0.8473
268	FOSLEMDBELEM	1793	97	15	1598	97	15	1	0.0000
269	FPTLRPHTHSJO	252	12.6	0	227	11.35	0	0	0.0000
270	FPTLRPIATS_G	252	12.6	0	227	11.35	0	0	0.0000
271	FPTLRPIATSTC	252	12.6	0	227	11.35	0	0	0.0000
272	FREFRTSTFLUT	284	5.68	0	191	3.82	0	0	0.0000
273	FRKNLNCAYVDB	637	23.44	0	637	23.44	0	1	0.4565
274	FRONTIER-ONT	2030	0	0	2030	0	0	0	0.0000
275	FRRTPYLUDKST	380	7.6	0	330	6.6	0	1	0.0000
276	FSTSCR__PTDF	1745	63	94	1257	63	94	0	0.0000
277	FSTSCRSTUCLN	1947	78	103	1554	78	103	0	0.0000
278	FTCAL_S	776	325	0	776	325	0	1	0.6006
279	FTMPRNHASPRN	3455	172.75	50	3057	152.85	100	0	0.0000
280	FTSXFMFTSXFM	480	128	0	480	128	0	0	0.0000
281	FVPFVT__PTDF	287	5.74	0	287	5.74	0	0	0.0000
282	GALFOS__PTDF	1085	113.9	0	1085	113.9	0	1	0.8095
283	GALFOSBEADBE	1085	21.7	0	1085	21.7	0	1	0.0000
284	GARALBQUAH47	191	4	0	171	3	0	1	0.9000
285	GARH71CORNEL	204	5	0	182	5	0	0	0.0000
286	GDBLPBGDRLPR	1625	33	212	1542	31	212	1	1.0000
287	GDDRDBAVNDAL	199	5.68	0	176	5.22	0	0	0.0000
288	GDDRDBSPUAVO	199	5.68	0	177	5.22	0	0	0.0000
289	GDGGDGDREELC	1790	90	0	1790	90	0	1	1.0000
290	GDGLOCGDGLOC	1542	31	0	1542	31	0	0	0.0000
291	GDRGDR__PTDF	1790	36	0	1790	36	0	0	0.0000
292	GEACOEGEAMRL	345	6.9	0	264	5.28	0	0	0.0000
293	GEALCT___JPM	301	57	0	301	57	0	0	0.0000
294	GEALCTAMAMRL	301	57	0	301	57	0	0	0.0000
295	GEALCTGEASNC	301	57	0	301	57	0	0	0.0000
296	GFDLKVBEADBE	292	34.44	0	239	33.38	0	1	0.8568
297	GGS	1800	175	0	1800	175	0	0	0.6500
298	GHEBVL__PTDF	598	11.96	0	598	11.96	0	0	0.0000
299	GHEBVLGHEWLX	896	38.92	0	790	36.8	0	1	0.5707
300	GHEFAIGHEBVL	382	18.74	0	382	18.74	0	1	0.5923
301	GHENASGHEWFK	240	4.8	0	240	4.8	0	0	0.0000
302	GHEOCTGHEWLX	312	19.04	0	277	18.32	0	1	0.6987
303	GHEWLX__PTDF	1195	97.9	0	1195	97.9	0	0	0.0000
304	GHEWLXBAKBRO	1195	23.9	0	1195	23.9	0	1	0.0000
305	GIBMRM__PTDF	1195	213.7	0	1195	213.7	0.3	1	0.8882
306	GIBPET__PTDF	1195	162.9	0	1195	162.9	0	1	0.8533
307	GIBPETGIBBDF	1195	23.9	0	1195	23.9	0	1	0.0000
308	GIBXFRGIBPET	431	8.62	0	357	7.14	0	1	0.0000

309	GILLACCOFROX	236	41.12	0	202	40.44	0	1	0.9001
310	GLGPDW__PTDF	382	76.24	0	382	76.24	0	1	0.8998
311	GLGPDWROCJEF	382	7.64	0	382	7.64	0	1	0.0000
312	GLGPDWSPDNSI	382	7.64	0	382	7.64	0	0	0.0000
313	GLGPDWTRMCLF	382	7.64	0	382	7.64	0	1	0.0000
314	GPCRAT__PTDF	291	20.92	0	129	17.68	0	1	0.8541
315	GRIS_LNC	1030	100	0	925	95	0	1	1.0821
316	GRNXFMGRNDUM	1826	74.92	0	1826	74.92	0	1	0.5125
317	GRTCENCAHCEN	382	27.44	54.3	370	27.2	66.3	1	0.7279
318	GRVRQT__PTDF	250	13.68	0	207	12.28	0	1	0.6136
319	GUTMTGMCRMTG	300	28.4	0	218	26.76	0	1	0.8371
320	H71GAR__PTDF	170	13.4	0	140	13.4	0	1	1.0000
321	HALPERCARWAK	750	37.5	75	608	30.4	75	1	0.9400
322	HANJUNMNSCHA	1554	31.08	0	1554	31.08	0	0	0.0000
323	HATYUK__PTDF	3507	175	0	2733	137	0	0	0.0000
324	HAVIPVHAVMMH	264	40.68	0	238	40.16	0	1	0.8815
325	HAVIPVHAVPWR	264	40.68	0	238	40.16	0	1	0.8815
326	HAZDUNEAUARP	167	3.34	0	167	3.34	0	0	0.0000
327	HAZX21HAZX22	224	4.48	0	224	4.48	0	0	0.0000
328	HBGPRD__PTDF	335	5	0	265	2	0	0	0.0000
329	HEMHUNHMPPNT	246	21.02	0	223	20.56	0	1	0.7831
330	HEMHUNTHTJWL	246	21.02	0	223	20.56	0	1	0.7831
331	HENXFMCULGVW	224	0	45	224	0	45	0	0.0000
332	HILXFMARNXFM	252	5	0	252	5	0	1	0.0000
333	HILXFMTIFARN	276	5.52	0	252	5.04	0	1	0.0000
334	HIPXFRGOSHIP	480	13.7	0	480	13.7	0	1	0.2993
335	HIVPRBLSDRML	287	5.74	0	226	4.52	0	0	0.0000
336	HIVPRBNAPMSN	287	5.74	0	226	4.52	0	1	0.0000
337	HIVPRBNAPWCL	287	5.74	0	226	4.52	0	1	0.0000
338	HKCBRLWLSGRV	335	9	0	265	9	0	0	0.0000
339	HL5PRLHL3MTZ	167	3.34	0	167	3.34	0	0	0.0000
340	HMPPNT__PTDF	1051.7	88.034	0	1051.7	88.034	0	1	0.7611
341	HMPPNTTHTJWL	1051.7	21.034	0	1051.7	21.034	0	1	0.0000
342	HNNLTVPWRT_G	191	39.72	0	191	39.72	0	1	0.9038
343	HOMWTC__PTDF	755	38	0	755	38	0	0	0.0000
344	HOYMAPSAMWYL	306	15.52	0	306	15.52	0	1	0.6057
345	HOYMAPWYLCAB	306	15.52	0	306	15.52	0	1	0.6057
346	HPVBRL__PTDF	335	6	0	265	6	0	0	0.0000
347	HYDROONE-ITC	1475	140.6	0	1375	138.6	0	1	0.0000
348	IATSJO__PTDF	956	79.72	0	956	79.72	0	1	0.7602
349	IATSTRLRDNUA	1195	97	0	1195	97	0	1	0.0000
350	IPAMACDUCTAZ	237	29.74	0	192	28.84	0	1	0.8669
351	IPVMACIPVHAV	237	30.54	0	192	29.74	0	1	0.0000
352	ISLDELARGTMP	128	10.76	0	113	10.46	0.54	1	0.7839
353	ITC-HYDROONE	1475	110	0	1375	108	0	1	0.7444
354	JFRANTBROSUL	2425	121	0	2425	121	0	0	0.0000
355	JLGGRBMULXFM	80	1.6	0	133	2.66	0	0	0.0000
356	JOPCAPJOPKEL	335	19.7	0	297	18.94	11.91	1	0.6864
357	JOPCAPJOPXFM	335	19.7	16.05	297	18.94	9.91	1	0.6864
358	JOPXFMSHAXFM	558	11.16	0	558	11.16	0	1	0.0000
359	KAHKAZCDNWYO	1000	125	0	1040	125	0	0	0.0000
360	KAHKAZPRNMTS	1000	135	0	1040	135	0	0	0.0000

361	KAMWBEKAMSCA	1589	143	0	1383	143	0	0	0.0000
362	KAMXFMBELHAS	1530	76.5	15	1434	71.7	22	0	0.0000
363	KAMXFMKAMSCA	1530	76.5	15	1434	71.7	22	0	0.0000
364	KAMXFRBMTXFM	1530	76.5	15	1434	71.7	15	0	0.0000
365	KANMURMURSID	478	20.76	0	478	20.76	0	1	0.5395
366	KANMURSIDXFM	478	20.76	0	478	20.76	0	1	0.5395
367	KAZMFKBAKBRO	1643	246	0	1598	246	0	0	0.0000
368	KAZMFKBROJFR	1643	246	0	1598	246	0	0	0.0000
369	KAZMFKCDNWYO	1000	240	0	1040	240	0	0	0.0000
370	KAZMFKPRNMTS	1000	240	0	1040	240	0	0	0.0000
371	KELORALUTESX	335	22	0	333	21.96	0	1	0.6967
372	KELXFRLUTESX	336	19.32	0	336	19.32	0	1	0.6522
373	KENEMR__PTDF	191	11.02	0	164	11.02	0	0	0.0000
374	KENWEDSPUMAY	199	5.68	0	177	5.22	0	0	0.0000
375	KEW_T1KEWNAP	390	24.4	0	390	24.4	0	1	0.6803
376	KEW_T1POBFXR	390	24.4	0	390	24.4	0	1	0.6803
377	KICHOL__PTDF	143	23.66	0	136	23.52	0	1	0.8844
378	KILCREWOOWIC	168	71	0	168	71	0	0	0.0000
379	KIRBLJ__PTDF	313	12.66	5	276	11.92	5	1	0.5369
380	KIRBLJTANESP	346	6.92	0	309	6.18	0	1	0.0000
381	KLNNESOLVGRA	143	5.06	11	246	7.12	11	1	0.3090
382	KNBPNDBAKBRO	191	28.08	0	191	27.98	0	1	0.8646
383	KNBPNDGHEWLX	184	3.68	0	179	3.58	0	1	0.0000
384	KRESEN__PTDF	401	25.22	0	339	23.98	0	1	0.7173
385	KRESENCABWYL	401	8.02	0	339	6.78	0	1	0.0000
386	KRESENMANHOY	401	8.02	0	339	6.78	0	1	0.0000
387	KRESENWYLSAM	401	8.02	0	339	6.78	0	1	0.0000
388	KSHLKVPLPZIO	329	6.58	0	288	5.76	0	0	0.0000
389	KYDLIV__PTDF	335	6.7	0	281	5.96	0	1	0.0000
390	KYGSPOAMOSXF	1610	145	5	1438	145	5	0	0.0000
391	KYGSPOBAKBRO	1610	145	5	1438	145	5	0	0.0000
392	LABMASLABWWD	1195	68.4	0	1195	68.4	0	1	0.6506
393	LACCOTWRVRXF	236	14.42	0	202	13.74	0	1	0.7060
394	LACNEOLANWIC	1159	35	0	1159	35	0	0	0.0000
395	LACWGRLACSTI	2109	113	0	1802	113	0	0	0.0000
396	LAKFOXLAKLKF	216	55.32	0	160	54.2	0	1	0.9410
397	LAMSCTBUCLNG	1029	0	0	812	0	0	0	0.0000
398	LAMSCTLAMCHM	1029	0	0	812	0	0	0	0.0000
399	LATGENTHTJWL	280	22.5	0	280	22.5	0	1	0.8156
400	LATLANSPREAS	236	48.92	0	202	48.24	0	1	0.9163
401	LBRITADPRLBR	1625	32.5	8.2	1739	34.78	8.2	1	1.0000
402	LCOBYNNELELC	1405	28.1	365.8	1739	34.78	365.8	1	1.0000
403	LCONEL__PTDF	1572	92.9	0	1234	92.9	0	1	1.0000
404	LCONELWEMPAD	1799	36	0	1530	31	0	1	1.0000
405	LEMFOS__PTDF	1677	67.84	161.4	1423	62.76	146.7	1	0.5465
406	LEMFOSBAYFOS	1793	54	0	1598	54	0	1	1.0000
407	LEMMAJBAYMON	956	75.32	0	956	75.32	0	1	0.7461
408	LEMWENLEMFOS	284	10.78	0	239	9.88	0	1	0.5162
409	LESNE_LESHIP	247	4.94	0	222	4.44	0	0	0.0000
410	LETDRA__PTDF	470	9.4	0	420	8.4	0	1	0.0000
411	LIMEMEADAHAZ	223	95.46	0	202	95.04	0	1	0.9575
412	LIMEMELEHWEB	223	95.46	0	202	95.04	0	1	0.9575

413	LKFFOXLKFWLM	216	55.32	0	160	54.2	0	0	0.0000
414	LKHJFFEAUARP	344	14.98	0	321	14.52	0	1	0.5579
415	LKJFOXARNHAZ	216	4.32	0	160	3.2	0	0	0.0000
416	LKJFOXLKJTRI	216	4.32	0	160	3.2	0	0	0.0000
417	LKVZIOZIOPLP	295	6	0	261	5	0	0	0.0000
418	LNEXFMKNAPAW	308	6.16	0	308	6.16	0	1	0.0000
419	LNSXFMKINLTH	308	6.16	0	308	6.16	0	0	0.0000
420	LNSXFMLNSBKW	308	6.16	0	308	6.16	0	1	0.0000
421	LOBITBDPBLOB	1625	32.5	0	1739	34.78	0	1	1.0000
422	LOMDESLOMITA	1625	32.5	17.5	1530	30.6	17.5	1	1.0000
423	LORTRKWEMPAD	271	47.62	0	200	46.2	0	1	0.9044
424	LORTRKWPAD_G	223	46.66	0	200	46.2	0	1	0.9044
425	LRTXFMBAKBRO	246	4.92	0	230	4.6	0	0	0.0000
426	LUTESXBLAFRA	1195	142	0	1195	139.4	0	1	0.0000
427	LUTESXNWMSTF	1225	0	0	1195	0	0	0	0.0000
428	MANBV2MANBV1	1162	72	0	1162	64	0	1	1.0000
429	MANBVA__PTDF	1162	58	0	1162	58	0	1	3.3655
430	MANBVAMANCRS	1162	29	0	1162	26	0	1	1.0000
431	MANCRSBVACRS	1162	101	0	1162	65	0	1	1.0000
432	MANHOYMANHGH	1434	60.28	14.4	1288	57.36	14.4	1	0.5509
433	MANIPMDOLSWS	260	38	0	260	38	0	0	0.0000
434	MARPLV__PTDF	253	10.3	0	210	10.3	0	1	1.0000
435	MARPLVRHESIL	295	5.9	0	260	5.2	0	1	1.0000
436	MASMTPDCKTAZ	137	27.44	0	137	27.44	0	1	0.9001
437	MASMTPHAVESF	137	27.44	0	137	27.44	0	1	0.9001
438	MASXF3MASXF2	478	33.26	0	478	33.26	0	1	0.7126
439	MCBOVEMTGOVE	335	17	0	297	16.24	0	1	0.6342
440	MCROVEBLAF_G	921	77.22	0	921	77.22	0	1	0.7615
441	MCTLPTSTWDUM	191	10.52	0	156	9.82	0	1	0.6823
442	MCTTRADUMSTW	143	9.86	0	143	9.86	0	1	0.7099
443	MCTTRAOLVGRA	143	9.86	0	143	9.86	0	1	0.7099
444	MERINPDCKTAZ	187	23.54	0	159	22.98	0	1	0.8616
445	MERLEMCAHMER	287	21.94	0	285	21.9	0	1	0.7397
446	MFTWLMFOSSCK	1315	66	76	1315	66	76	1	1.0000
447	MFTXF9DBNTNR	556.4	45.23	0	474.8	43.6	0	1	0.7800
448	MFTXFMEBDTER	556.4	45.228	0	474.8	43.596	0	1	0.7822
449	MFTXFMJEFHRC	556.4	11.128	0	474.8	9.496	0	0	0.0000
450	MFTXFMROCJEF	556.4	11.128	0	474.8	9.496	0	0	0.0000
451	MFTXFMZIMXFM	556.4	11.128	0	474.8	9.496	0	0	0.0000
452	MGLRGVMGPODN	198	8.36	0	180	8	9	1	0.5500
453	MGPSTRMGPST3	124	7.88	0	124	7.88	0	1	0.6853
454	MH_ONT_E	300	6.1	0	300	6.1	0	1	0.0164
455	MH_ONT_W	300	6.5	0	300	6.5	0	1	0.0769
456	MH_SPC_E	475	80.7	0	475	80.7	0	1	0.8823
457	MH_SPC_W	450	38.2	0	450	38.2	0	1	0.7644
458	MHEX_MAPP_N	1050	521	0	675	513.5	0	1	0.9737
459	MHEX_MAPP_S	2050	200.3	0	2050	200.3	0	1	0.7953
460	MHEX_MISO_N	1050	521	0	675	513.5	0	1	0.9737
461	MHEX_MISO_S	2050	200.3	0	2050	200.3	0	1	0.7953
462	MHEX_N	1050	521	0	675	513.5	0	1	0.9737
463	MHEX_S	2050	200.3	0	2050	200.3	0	1	0.7953
464	MID842BLUXFM	355	7.1	0	344	6.88	0	1	0.0000

465	MID870__PTDF	247	4.94	0	219	4.38	0	1	0.0000
466	MID870MILPDW	311	6.22	0	271	5.42	0	1	0.0000
467	MIDXF1MIDXF3	552	11.04	0	515	10.3	0	1	0.0000
468	MILMSLCR6CRN	193	4.46	0	193	4.46	0	0	0.0000
469	MITELR__PTDF	547	27	0	526	26	0	0	0.0000
470	MITELRSAMWYL	681	34	0	598	30	0	0	0.0000
471	MITELRWYLCAB	681	34	0	598	30	0	0	0.0000
472	MKROHC__PTDF	1159	57.95	0	971	48.55	0	0	0.0000
473	MKROHCELIFOS	1526	137	0	1281	137	0	0	0.0000
474	MLDXFM__PTDF	70	1.4	0	70	1.4	0	0	0.0000
475	MLREPOMLRLOW	1732	86.6	0	1732	86.6	0	0	0.0000
476	MLRLOWDNLMCK	1732	86.6	0	1732	86.6	0	0	0.0000
477	MNSCHABVAHAN	1837	36.74	0	1641	32.82	0	0	0.0000
478	MNSHGHMNSHOY	1673	77.46	0	1640	76.8	0	1	0.5729
479	MNTZUMA_W	765	116	0	765	116	0	1	0.6560
480	MOBOVETHIMCC	290	9.6	0	242	8.64	0	1	0.4398
481	MONBAY__PTDF	1793	217.16	0	1536	212.02	0	1	0.8551
482	MONBAYFOSBAY	1793	35.86	0	1536	30.72	0	1	0.0000
483	MONBAYLUL3TM	1793	35.86	115	1536	30.72	115	1	0.0000
484	MONBNS__PTDF	2210	300.8	0	1548	287.56	8.26	1	0.8923
485	MONBNSMONWNE	2210	44.2	0	2007	40.14	305	1	0.0000
486	MONEWNDUMSTW	143	10.66	0	137	10.54	0	1	0.7400
487	MONTROCLINTN	370	18.5	0	370	18.5	0	0	0.0000
488	MONWNEMONBNS	2199	107.08	0	2002	103.14	279.86	1	0.6118
489	MORSTISPRNOR	287	6	0	287	6	0	0	0.0000
490	MRDFRDMRDQUE	237	34.44	0	192	33.54	0	1	0.8855
491	MRMDRS__PTDF	1195	80.2	0	1195	80.2	0	1	0.7020
492	MRMDRSGIBPET	1195	58.2	0	1195	58.2	0	0	0.0000
493	MRNRENEWFSHA	249	15.6	0	203	14.26	0	0	0.0000
494	MRNSMA__PTDF	249	22.58	0	203	21.66	0	1	0.8126
495	MRTFERMTZBON	80	1.6	0	76	1.52	0	0	0.0000
496	MSHXFM__PTDF	1394	69.7	0	1299	64.95	0	0	0.0000
497	MSKOHCKAMSCA	1526	115	0	1281	115	0	0	0.0000
498	MT1RXFSX1RXF	287	46.14	13.21	286	46.12	58.15	1	0.8760
499	MT3RXFSX2RXF	287	51.64	0	286	51.62	0	1	0.8892
500	MTGSPC__PTDF	956	19.12	0	904	18.08	0	1	0.0000
501	MTGSPCCOFPAN	956	19.12	0	904	18.08	0	1	0.0000
502	MTSDOUBLOBED	2598	129.9	201	2271	113.55	201	0	0.0000
503	MTSDOUMTSMDW	2598	0	0	2271	0	0	0	0.0000
504	MUNBURDUMW_G	1195	60.7	203.3	1195	60.7	203.3	1	0.6063
505	MUNBURDUMWIL	1195	60.7	203.4	1195	60.7	203.4	1	0.6063
506	MUNBUROLVUPN	1195	60.7	0	1195	60.7	0	1	0.6063
507	MUNBURUPNEFR	1195	60.7	0	1195	60.7	0	1	0.6063
508	MURSIDSIDXFM	287	20.24	0	287	20.24	0	1	0.7164
509	MUSCLAMUSRSS	896	85	0	896	85	0	0	0.0000
510	MWSI	1480	208.7	0	1480	208.7	0	1	0.8582
511	MYVELIMYVSWL	1375	124	0	1220	124	0	0	0.0000
512	MYVTAN__PTDF	1434	137.78	0	1434	137.78	0	1	0.7918
513	MYVXFM__PTDF	3550	178	0	3160	158	0	0	0.0000
514	N_E_KU_INTER	1673	33.763	0	1643	33.163	0	0	0.0000
515	NAP_T1NAP_T2	450	27.1	0	450	27.1	0	1	0.6679
516	NAP_T2NAP_T1	478	30.06	0	478	30.06	0	1	0.6820

517	NAP_T2NAP_T3	478	30.06	0	478	30.06	0	1	0.6820
518	NAP_T3NAP_T2	450	27.3	0	450	27.3	0	1	0.6703
519	NAPLSDKEWXFM	271	52.12	0	209	50.88	0	1	0.9178
520	NAPRRN__PTDF	1004	20.08	0	838	16.76	0	1	0.0000
521	NCAFALFALXFM	347	17.3	0	276	13.8	0	0	0.0000
522	NCATRAUPNEFR	143	21.46	2.54	143	21.46	2.54	1	0.8667
523	NCOCAHBALCAH	569	30.38	0	475	28.5	0	1	0.6667
524	NCOCAHPICSTJ	569	30.38	0	475	28.5	167.65	1	0.6667
525	NCOCAHWFRXFM	569	30.38	17.1	475	28.5	63.65	1	0.6667
526	NCOXFMBALWMV	140	4.2	0	140	4.2	0	1	0.3333
527	NDEX	2150	394	0	2150	394	0	1	0.3556
528	NED_T1EARP_G	286	5.72	0	286	5.72	0	1	0.0000
529	NED_T1WEMPAD	286	5.72	0	286	5.72	0	1	0.0000
530	NED_T1WEMROE	286	5.72	0	286	5.72	0	1	0.0000
531	NELDIXNELDIX	290	15	0	290	15	0	1	1.0000
532	NELELCCHESIL	1235	25	0	1235	25	0	0	0.0000
533	NELNETNELDIX	272	5	0	280	6	0	1	1.0000
534	NELX82NELX84	480	10	0	480	10	0	0	0.0000
535	NELX84NELX82	465	9	0	465	9	0	0	0.0000
536	NELXFM__PTDF	400	10.1	0	400	10.1	0	1	1.0000
537	NEOHIN__PTDF	4463	89.26	0	4050	81	0	0	0.0000
538	NEOMATSIDXFM	478	13.36	0	477	13.34	0	1	0.2849
539	NESONENESTUL	1182	63	0	1055	63	0	0	0.0000
540	NEVBDMFTZT_G	408	30.36	0	332	28.84	0	1	0.7698
541	NEWCAS__PTDF	1195	82	0	1019	78.48	0	1	0.7403
542	NEWCASNEGCAS	1195	24.3992	0	1126	23.0192	0	1	0.0217
543	NEWCASXENWMV	1195	23.9	0	1126	22.52	0	1	0.0000
544	NEWEFFNEWCAS	287	13.34	0	264	12.88	0	1	0.5901
545	NEWMAPDUMSTL	143	12.36	8.64	137	12.24	8.64	1	0.7761
546	NEWMAPOLVGRA	143	12.36	8.64	137	12.24	8.64	1	0.7761
547	NEWROBNEWCAS	287	8.44	0	269	8.08	0	1	0.3261
548	NEWTRADUMSTL	143	21.46	2.54	143	21.46	2.54	1	0.8667
549	NEWTRAOLVGRA	143	21.46	2.54	143	21.46	2.54	1	0.8667
550	NEWTRAOLVUPN	143	21.46	2.54	143	21.46	2.54	1	0.8667
551	NEWXEN__PTDF	1195	120	0	1019	116.48	0	1	0.8250
552	NEWXF1NEWCAS	450	17.2	0	450	17.2	0	1	0.4767
553	NEWXF1XENWMV	450	17.2	0	450	17.2	0	1	0.4767
554	NEWXF2NEWCAS	450	17.2	0	450	17.2	0	1	0.4767
555	NEWXF2NEWXEN	450	17.2	0	450	17.2	0	1	0.4767
556	NFLAVIFTZT_G	262	5.24	0	230	4.6	0	1	0.0000
557	NHBHBG__PTDF	191	1	0	191	1	0	0	0.0000
558	NHBXFM__PTDF	224	1	3	224	1	3	0	0.0000
559	NHBXFMCMNNAL	224	1	0	224	1	0	0	0.0000
560	NLNWEBJEFGRN	615	41	0	492	38.54	0	1	0.7447
561	NLNWEBJEFROC	615	36.2	0	492	33.74	0	1	0.7100
562	NOBFAL__PTDF	956	47.82	0	956	47.82	0	1	0.6002
563	NOCOCO__PTDF	2750	138	0	2317	116	0	0	0.0000
564	NSIBGRNSIJFJ	359	19.58	0	319	18.74	0	1	0.6617
565	NSIJFJNSIBGR	359	15	0	319	15	0	1	0.5867
566	NTVCMN__PTDF	335	0	86	265	0	86	1	0.0000
567	NTVCVPCMNNAL	287	29	0	275	28.9	0	1	0.8030
568	NTVTRY__PTDF	335	17.7	12	279	16.58	12	1	0.6634

569	NTVXFM__PTDF	168	53.76	0	168	53.76	0	1	0.9375
570	NTVXFMHENXFM	176	3.52	0	176	3.52	0	1	0.0000
571	NWMDLL__PTDF	1725	86.25	0	1500	75	0	0	0.0000
572	NWMDLLISEDLL	1725	86.25	0	1500	75	0	0	0.0000
573	NWMDLLMSHCUM	1725	86.25	0	1500	75	0	0	0.0000
574	NWMDLLMSHSHA	1725	86.25	0	1500	75	0	0	0.0000
575	NWMDLLNWMTTV	1725	86.25	0	1500	75	0	0	0.0000
576	NWMDLLSHELGC	1725	86.25	0	1500	75	0	0	0.0000
577	NWMXFMMSHCUM	862	43.1	0	750	37.5	0	0	0.0000
578	NWMXFMSHBLGC	862	43.1	0	750	37.5	0	0	0.0000
579	NWOHIN__PTDF	3354	67.08	0	2846	56.92	0	0	0.0000
580	NWTPATLYDVAL	287	42	0	261	42	0	0	0.0000
581	NYIS-ONT	4125	0	0	3812	0	0	0	0.0000
582	OAKTOY__PTDF	286	45.82	0	274	45.58	0	1	0.8798
583	OCEGALELIFOS	984	86.18	4.92	984	86.18	4.92	1	0.7716
584	OCONOCOCOBOW	2598	130	0	2598	130	0	0	0.0000
585	OHEAIN__PTDF	3301	66.02	0	2748	54.96	0	0	0.0000
586	OLVXFMOLVCOO	914	49	0	826	49	0	0	0.0000
587	ONIMAJ__PTDF	1339	93.18	0	1338	93.16	0	1	0.7128
588	ONT-FRONTIER	2030	0	0	2030	0	0	0	0.0000
589	ONT-NYIS	4125	0	0	3812	0	0	0	0.0000
590	ORNSTDLUTESX	335	22	0	333	21.96	0	1	0.6967
591	OTTOGLHNNOGL	143	11.76	0	143	11.76	0	1	0.7568
592	OTWLKVDBEBEA	399	39.1	0	336	37.8	0	1	0.8219
593	OTWTOUBEADBE	231	33.22	0	206	32.72	0	1	0.8741
594	OVECALBLAFRA	335	11.5	0	335	11.5	0	1	0.4174
595	OVESIB__PTDF	956	90.52	0	956	90.52	0	1	0.7888
596	OVEXFMBLAFRA	300	6	0	300	6	0	1	0.0000
597	OVEXFMOVESIB	335	20.1	0	335	20.1	0	1	0.6667
598	PADBLKPADTLR	406	20.02	0	403	19.96	0	1	0.5962
599	PADTLRPADBLK	402	30.64	0	403	30.66	0	1	0.7371
600	PADTLRWEMROE	402	8.04	0	403	8.06	0	1	0.0000
601	PADXFMWEMROE	717	14.34	0	717	14.34	0	1	0.0000
602	PALBENTWBARG	1452.1	128.042	20	1452.1	128.042	20	1	0.7732
603	PALCOOTWBARG	1452.1	137.242	20	1452.1	137.242	20	1	0.7884
604	PALXFMMONSPE	386	42.42	0	336	41.42	0	1	0.8378
605	PANMOWKINLAT	287	50.74	0	287	50.74	0	1	0.8869
606	PANMOWPONLAT	287	50.74	0	287	50.74	0	1	0.8869
607	PANRAMCOFPAN	287	32.24	0	264	31.78	0	1	0.8339
608	PANXFMCOFCFN	400	19.3	0	400	19.3	0	1	0.5855
609	PANXFMKINLNS	400	29.1	0	400	32.6	0	1	0.0000
610	PANXFMKINLTH	400	8	0	400	8	0	1	0.0000
611	PANXFMKINPAW	400	29.1	0	400	32.6	0	1	0.0000
612	PARALQWEMROE	329	6.58	0	288	5.76	0	0	0.0000
613	PAWAUBKINLTH	382	60.44	0	382	60.44	0	1	0.8736
614	PAWXFMKINLTH	450	52.4	0	450	55	0	1	0.8200
615	PAWXFMPANKIN	450	48.6	0	450	48.6	0	1	0.8148
616	PDRSSH__PTDF	238	0	0	223	0	0	0	0.0000
617	PDRSSHBAKBRO	249	0	0	239	0	0	0	0.0000
618	PDRSSHBROSUL	259	12.7	0	223	12.06	0	0	0.0000
619	PDRSSHPRDMTG	259	0	0	223	0	0	0	0.0000
620	PDWPDR__PTDF	370	7.4	0	370	7.4	0	1	0.0000

621	PDWPDRCRNCR6	370	104.28	0	370	104.28	0	1	0.0000
622	PERASBSAMWYL	2148	42.96	0	1881	37.62	0	0	0.0000
623	PERASBWYLCAB	2148	42.96	0	1881	37.62	0	0	0.0000
624	PETCTO__PTDF	273	17.86	53.14	218	16.76	54.24	1	0.7399
625	PETFRN__PTDF	956	54.72	35.28	956	54.72	35.28	1	0.6506
626	PETLSRGIBBDF	1195	34.4	12	1195	34.4	12	1	0.3052
627	PETOAK__PTDF	191	21.62	0	191	21.62	0	1	0.8233
628	PETOAKGIBXFM	225	4.5	0	192	3.84	0	1	0.0000
629	PETTHO__PTDF	1195	69.5	37.28	956	64.72	37.28	1	0.7046
630	PETXFM__PTDF	140	10.1	0	140	10.1	0	1	0.7228
631	PETXFMPETXFM	150	3	0	150	3	0	1	0.0000
632	PHBPOC__PTDF	693	71.52	21.54	693	71.52	21.54	1	0.7816
633	PIEBEJEBDTER	364	7.324	0	332	6.684	0	0	0.0000
634	PIEFST__PTDF	1195	229	0	1195	229	0	1	0.8956
635	PIEFSTSTUFST	1195	23.9	0	1195	23.9	0	1	0.0000
636	PIEXFAPIEFST	191	17	0	172	17	0	0	0.0000
637	PIEXFBPIEFST	177	17	0	172	17	0	0	0.0000
638	PINPIVPHBPOC	314	15.7	9	249	12.45	9	0	0.8264
639	PINPIVVOLXFM	314	15.7	0	249	12.45	0	0	0.0000
640	PINXFM__PTDF	566	31.52	30.82	506	30.7	32.82	0	0.0000
641	PITSMLPITSSE	956	138	0	956	138	0	1	0.0000
642	PJCPWRHAVMMH	166	3.32	0	166	3.32	0	0	0.0000
643	PLPARCPLRRAC	1434	28.68	0	877	17.54	0	1	0.0000
644	PLPARCZIOARC	1434	28.68	0	877	17.54	0	1	0.0000
645	PLPRACPLPADN	1434	28.68	0	1096	21.92	0	0	0.0000
646	PLPRACWEMPAD	1434	28.68	0	1096	21.92	0	1	0.0000
647	PLPRACWEMROE	1434	28.68	0	1096	21.92	0	1	0.0000
648	PLPZIOCHESIL	1434	28.68	0	1096	21.92	0	0	0.0000
649	PLPZIOZIOARC	1434	28.68	0	1096	21.92	0	1	0.0000
650	PMYXFMPMTSBT	386	42.42	0	370	42.1	0	1	0.8242
651	POCPHB__PTDF	693	25.9	0	693	25.9	0	1	0.0000
652	PONWILPONDRE	1362	27.24	0	1234	24.68	0	0	0.0000
653	PR_ISL_BYRON	835	119.7	0	835	119.7	0	1	0.8605
654	PRIRRKC2FLC1	670	63.4	0	670	63.4	0	1	0.7886
655	PRNMTS__PTDF	3507	175.35	221.55	2731	136.55	221.55	0	0.0000
656	PRNMTSBEDDOU	3886	194.3	225.3	3326	166.3	225.3	0	0.0000
657	PRNMTSBLOBED	3886	194.3	255.3	3326	166.3	255.3	1	0.9400
658	PRNMTSHATBLO	3886	194.3	235.3	3326	166.3	235.3	0	0.0000
659	PULSTIPULSTI	264	5.28	0	204	4.08	0	0	0.0000
660	PULSTIWCLMGN	264	5.28	0	204	4.08	0	0	0.0000
661	PWRTAZ__PTDF	1195	182.7	0	1195	182.7	0	1	0.8692
662	PWRTAZPWBGDB	1195	23.9	0	1195	23.9	0	1	0.0000
663	PWRTAZPWRGDR	1195	23.9	0	1195	23.9	0	1	0.0000
664	QUA471CDVNEL	1589	32	0	1589	32	0	0	0.0000
665	QUACDVQUA471	1530	31	0	1530	31	0	0	0.0000
666	QUADCITY_W	1530	219	0	1530	219	0	1	0.8826
667	QUARCK__PTDF	956	105.62	0	956	105.62	0	1	0.8190
668	QUARCKCORMOL	956	19.12	0	956	19.12	0	1	0.0000
669	QUEENSTON_FW	1780	0	0	1780	0	0	0	0.0000
670	QUEQUS__PTDF	287	5.74	33	240	4.8	18	1	0.0000
671	RCKDWTQUAS91	223	4.46	0	200	4	0	0	0.0000
672	RCKXFM__PTDF	448	92.96	0	448	92.96	0	1	0.9036

673	RCKXFMQUADAV	448	8.96	0	448	8.96	0	1	0.0000
674	READEMMTZBON	223	38	0	192	38	0	0	0.0000
675	REIDVI__PTDF	335	2	0	265	2	0	0	0.0000
676	RENLIV__PTDF	223	0	7	223	0	7	0	0.0000
677	RENLIVEWFSHA	223	0	8	223	0	8	0	0.0000
678	RENLIVKELJOP	223	6.69	0	223	6.69	0	0	0.0000
679	REYMONDEQWES	287	8.64	5	253	7.96	5	1	0.3643
680	REYXFMDEQWES	224	11.98	2.02	224	11.98	2.02	1	0.6260
681	RISXFMCNOBKW	448	8.96	0	448	8.96	0	1	0.0000
682	RIVDELBLAFRA	450	12.3	0	418	11.66	0	1	0.2830
683	RIVFRELUTSTF	305	15.5	0	255	14.5	0	1	0.6483
684	ROE_T2ROE_T3	336	29.42	0	336	29.42	0	1	0.7716
685	RQTERL__PTDF	223	4.46	0	207	4.14	0	1	0.0000
686	RRNNPTRRNGPK	236	4.72	0	236	4.72	0	0	0.0000
687	RRNWAVRRNNAP	340	6.8	0	277	5.54	0	1	0.0000
688	RRNWESRRNGPK	138	2.76	0	121	2.42	0	1	0.0000
689	RSSEXGSSPPRA	295	18	0	295	18	0	0	0.0000
690	RSSROEWEMROE	545	50.4	0	476	49.02	0	1	0.8058
691	RSSTPSRSSJEN	210	34	0	187	34	0	0	0.0000
692	RSVCMP__PTDF	1581	409.32	0	1374	405.18	0	1	0.9322
693	RSVCMPRSVTAL	1581	31.62	0	1374	27.48	0	1	0.0000
694	RUSSTF__PTDF	1414	28.28	0	1200	24	0	1	0.0000
695	RUSSTFBLAFRA	1414	65.22	0	1414	65.22	0	0	0.0000
696	S12TEKS34RAU	256	71	0	256	84	0	1	0.0000
697	SALJCRWEMPAD	335	6.7	0	300	6	0	0	0.0000
698	SALXFMCORMOL	336	28.12	0	336	28.12	0	1	0.7610
699	SALXFMHL3TIF	336	28.32	0	336	28.32	0	0	0.0000
700	SALXFMQUADAV	336	28.12	0	336	28.12	0	1	0.7610
701	SALXFMQUAS91	336	6.72	0	336	6.72	0	1	0.0000
702	SALXFMTIFARN	336	28.32	0	336	28.32	0	0	0.0000
703	SALXFMWEMPAD	336	28.12	0	336	28.12	0	1	0.7610
704	SAMBVA__PTDF	1778	34.68	0	1732	28.36	0	1	1.0000
705	SAMBVASAMHGH	1778	89.65	0	1732	86.6	0	1	1.0000
706	SAMHGHSAMBVA	980	60.2	0	980	60.2	0	1	0.6744
707	SAMSCASAMSTA	1153	51.36	0	1031	48.92	0	1	0.5785
708	SAMSCASAMWYL	1153	51.36	0	1031	48.92	0	1	0.5785
709	SAMSCATIDCNT	1153	23.06	0	1031	20.62	0	0	0.0000
710	SAMSTASCASTA	1278	106.36	0	1287	106.54	0	1	0.7584
711	SAMWYL__PTDF	1548	77	0	1212	61	0	1	1.0000
712	SAMWYLBMTHAS	1676	84	0	1483	74	0	0	0.0000
713	SAMWYLBVACTN	1676	83.8	0	1483	74.15	0	0	0.0000
714	SAMWYLKAMFTM	1676	34	0	1483	31	0	1	1.0000
715	SAMWYLKAMXFM	1676	83.8	103	1483	74.15	206	1	1.0000
716	SAMWYLPERASB	1676	84	0	1483	74	0	0	0.0000
717	SAMWYLSAMSCA	1676	85	0	1483	79	0	1	1.0000
718	SAMWYLTIDWYL	1676	84	117	1483	74	233	1	1.0000
719	SCASTASAMSTA	1554	140	0	1383	140	0	0.51	0.5100
720	SCAXFM__PTDF	2410	93	0	1954	86	0	0	0.0000
721	SCAXFMKAMXFM	2734	309	0	2402	309	0	0	0.0000
722	SCAXFMMRYXFM	2734	309	0	2402	309	0	0	0.0000
723	SCAXFMTIDCNT	2734	309	0	2402	309	0	0	0.0000
724	SCODEADELNEO	232	48	0	232	48	0	0	0.0000

725	SCRCAYWHEAMO	1195	80.4	0	1195	80.4	0	1	0.7027
726	SENKREKYSSBN	401	8.02	0	339	6.78	0	1	0.0000
727	SENKREWYLCAB	401	8.02	0	339	6.78	0	1	0.0000
728	SENMAPMANHOY	374	24.68	36.12	353	24.26	35.49	1	0.7090
729	SENMAPWYLSAM	229	21.78	39.02	229	21.78	37.97	1	0.7897
730	SEQCONNOCOCO	2598	129.9	0	2598	129.9	0	0	0.0000
731	SHAC31JOPCAP	555	27.75	0	350	17.5	0	0	0.0000
732	SHAC37__PTDF	556	27.8	0	350	17.5	0	0	0.0000
733	SHACLT__PTDF	312	15.6	16.5	234	11.7	16.5	0	0.0000
734	SHACLTSHAXFM	312	15.6	0	234	11.7	0	0	0.0000
735	SHACMN__PTDF	312	15.6	0	234	11.7	0	0	0.0000
736	SHAJOP__PTDF	1376	64.65	0	1072	47.45	0	1	1.0000
737	SHAXFM__PTDF	1394	69.7	6	1308	65.4	6	0	0.0000
738	SHBDLL__PTDF	2165	108.25	0	2165	108.25	0	0	0.0000
739	SHEBURDUMWIL	1195	55.4	250.3	1195	55.4	250.3	1	0.5686
740	SIDMIRSIDRAN	287	47.94	0	272	47.64	0	1	0.8858
741	SIDMIRSIDSWC	287	47.94	0	272	47.64	0	1	0.8858
742	SIDRANCOFPAN	215	33.7	0	174	32.88	0	1	0.8942
743	SIDRANSIDMIR	215	33.7	0	174	32.88	0	1	0.8942
744	SIDXFM__PTDF	560	84.9	0	560	84.9	0	1	0.8681
745	SIDXFMBKWBLG	560	11.2	0	560	11.2	0	1	0.0000
746	SIDXFMBUNXFM	560	11.2	0	560	11.2	42	1	0.0000
747	SIDXFMDUMWIL	560	11.2	0	560	11.2	21	1	0.0000
748	SJOHTHIATSTC	1195	94	0	1138	94	0	0	0.0000
749	SJOMDY__PTDF	164	11	0	164	11	0	0	0.0000
750	SJOMDYFPTSJO	223	7	0	182	7	0	0	0.0000
751	SLMWMVNEWXEN	204	17.38	0	159	16.48	2.72	1	0.8070
752	SLNROXSHEXFM	287	25.34	0	253	23.96	0	1	0.0000
753	SLNWLF__PTDF	408	22.36	11.5	344	21.08	11.5	1	0.6736
754	SLNWLFBURSHE	408	8	0	344	7	0	1	1.0000
755	SLNWLFEFRUPN	408	8.16	17	344	6.88	17	1	0.0000
756	SLNWLFSLNWPK	408	8.16	17	344	6.88	17	1	0.0000
757	SLNWLFUPNOLV	408	8.16	17	344	6.88	17	1	0.0000
758	SLNWLFWILDUM	408	8	0	344	7	0	1	1.0000
759	SMAMRN__PTDF	167	108.14	0	167	108.14	0	1	0.9691
760	SMIGRSSMIHCO	287	44.52	0	263	44.52	0	0	0.0000
761	SMIGRSSMIXFM	287	44.52	0	263	44.52	0	0	0.0000
762	SMIXFMGHEWLX	314	6.28	0	308	6.16	0	0	0.0000
763	SMIXFMHBGHCO	314	6.28	0	314	6.28	0	0	0.0000
764	SONCCTCOCSON	451	9.21	0	430	8.79	0	0	0.0000
765	SONCOCCOCCCT	478	9.71	0	430	8.75	0	0	0.0000
766	SPCPLTCOFPAN	1195	23.9	0	908	18.16	0	1	0.0000
767	SPCPMT__PTDF	1195	89.7	0	908	83.96	0	1	0.7837
768	SPDGHE__PTDF	598	121.34	0	598	121.34	0	1	0.8818
769	SPDNSI__PTDF	287	5.74	0	287	5.74	0	1	0.0000
770	SPDNSIROCJEF	287	5.74	0	287	5.74	0	1	0.0000
771	SPDNSISPDGHE	287	5.74	5	287	5.74	5	1	0.0000
772	SPDNSITRMCLF	287	5.74	0	287	5.74	0	1	0.0000
773	SPDRAMBUKMID	1195	23.9	0	1195	23.9	0	0	0.0000
774	SPDXFMGHEWLX	478	56.36	0	478	56.36	0	1	0.8304
775	SPDXFMROCJEF	478	56.36	0	478	56.36	0	1	0.8304
776	SPETRILAKRAU	223	39.26	0	195	38.7	0	1	0.8992

777	SPHWMCSUMEMC	148	35	0	148	35	0	1	0.0000
778	SPPSPSTIES	993	540	0	899	540	0	0	0.0000
779	SPRXFMDEQWES	112	3.64	2	112	3.64	2	1	0.3846
780	SPUKEN__PTDF	263	0	0	227	0	0	0	0.0000
781	STACAR__PTDF	1147	120.24	0	1030	117.9	0	1	0.8253
782	STACARJUNAVO	1147	22.94	0	1030	20.6	0	1	0.0000
783	STACARSTAJUN	1147	22.94	62.1	1030	20.6	62.1	1	0.0000
784	STAJUN__PTDF	1153	243.36	0	1030	240.9	0	1	0.9145
785	STAJUNHANJUN	1153	23.06	0	1030	20.6	0	1	0.0000
786	STAJUNSTACAR	1153	23.06	119.2	1030	20.6	119.2	1	0.0000
787	STAXFMSTAROX	560	54.1	0	560	54.1	0	1	0.7930
788	STCTRMSTCLAM	1231	48.52	0	1128	46.46	0	1	0.5144
789	STFLUT__PTDF	1195	57.8	0	1072	55.34	0	1	0.6126
790	STFLUTBLAFRA	1195	23.9	0	1195	23.9	0	1	0.5865
791	STFLUTFRASAL	1195	23.9	0	1195	23.9	0	0	0.0000
792	STFLUTSHAEWF	1195	23.9	0	1195	23.9	0	0	0.0000
793	STFLUTWMVEWF	1195	23.9	0	1195	23.9	0	0	0.0000
794	STFXFM__PTDF	560	62.2	0	560	62.2	0	1	0.8199
795	STIAMBMGNPLA	143	14.16	0	113	13.56	0	1	0.8333
796	STICVZMGNPLA	145	13.3	0	113	12.66	0	1	0.8215
797	STIPNRNAPWCL	342	26.74	0	265	25.2	0	1	0.7897
798	STKMRG__PTDF	252	12.6	0	227	11.35	0	0	0.0000
799	STKMRGLACNEO	252	12.6	0	227	11.35	0	1	0.0000
800	STKMRGMRGBKL	252	12.6	0	227	11.35	0	0	0.0000
801	STLDUM__PTDF	1697	176.34	0	1447	171.34	0	1	0.8311
802	STLRDLSTLPHI	335	30	0	293	30	0	1	0.0000
803	STRMGPSTRMG3	124	6.58	0	124	6.58	0	1	0.6231
804	STUCLN__PTDF	1195	60	47	1195	60	47	1	1.0000
805	STUFST__PTDF	1195	53.6	0	1195	53.6	0	1	0.5541
806	SUNFAL__PTDF	956	39.12	78	956	39.12	78	1	0.5112
807	SWSANASWSFTC	210	31	0	210	31	0	0	0.0000
808	SX2MT1SX1RXF	338	44.16	0	280	43	0	1	0.8698
809	TASNPL__PTDF	335	14	0	279	12.9	0	1	0.7213
810	TASRAT__PTDF	335	17.3	0	279	16.18	0	1	0.6551
811	TAYPAWCOFPAN	287	19.94	0	264	19.48	0	1	0.7290
812	TCRWIEARPRRN	239	40.68	0	239	40.68	0	1	0.8825
813	TCRWIEEARP_G	239	40.68	0	239	40.68	0	1	0.8825
814	THIMOBTHIMCR	414	20.7	0	372	18.6	0	0	0.0000
815	THIMOBTHISBY	414	20.7	0	372	18.6	0	0	0.0000
816	THMSALTHMMOB	348	28	0	348	28	0	0	0.0000
817	THTJWL__PTDF	1238.7	134.674	0	1238.7	134.674	0	1	0.8160
818	THTJWLHMPPNT	1238.7	24.774	0	1238.7	24.774	0	1	0.0000
819	TIDCNTKAMSCA	1147	103	0	1023	103	0	0	0.0000
820	TIDWYLKAMXFM	1533	138	0	1193	138	0	0	0.0000
821	TIFARN__PTDF	810	238.9	0	810	238.9	0	1	0.9322
822	TIFARNHILMON	810	16.2	0	810	16.2	0	1	0.0000
823	TIFARNMTZBON	717	238.9	0	717	238.9	0	0	0.0000
824	TILTTPWMVEWF	287	45.94	0	287	45.94	0	1	0.8751
825	TIPCLOBAKBRO	173	27.86	0	145	27.26	0	1	0.8951
826	TKYSBLBALXFM	287	18.04	0	287	18.04	0	1	0.6818
827	TNRHNA__PTDF	956	78.52	51.48	956	78.52	51.48	1	0.7565
828	TOMMAJ__PTDF	1195	127.3	0	1052	124.44	0	1	0.8309

829	TOMMAJONEMAJ	1339	26.78	0	1195	23.9	0	1	0.0000
830	TOUOTWDBEBEA	288	36.86	0	286	36.82	0	1	0.8446
831	TRKCASWEMPAD	271	50.62	0	200	49.2	0	1	0.9187
832	TRMXFMBUKMID	276	13.96	0	258	13.96	0	0	0.0000
833	TUPTUPVALPIT	144	14	0	144	14	0	0	0.0000
834	TWBARG__PTDF	1600	107.7	0	1554	106.78	0	1	0.7089
835	TWBARGCOKPAL	1434	28.68	0	1554	31.08	0	1	0.0000
836	TWBARGCOOBEN	1600	32	0	1554	31.08	0	1	0.0000
837	TWBARGROBARG	1600	32	0	1554	31.08	0	1	0.0000
838	TWRXFMSCHXFM	336	33.92	0	336	33.92	0	1	0.8019
839	VALLYDELDLWD	1183	231	0	1176	231	0	1	0.0000
840	VENTRIVENCAM	287	19.24	0	287	19.24	0	1	0.7017
841	VINDYSARNHAZ	335	21.2	0	276	20.02	0	1	0.7243
842	VOLPHB__OTDF	1732	86.6	0	1732	86.6	0	0	0.0000
843	VOLPHBVOLXFM	1732	86.6	0	1732	86.6	0	0	0.0000
844	VOLXFMVOLPHB	1394	69.7	0	1394	69.7	0	0	0.0000
845	WARFLC__PTDF	99	5	0	82	4	0	0	0.0000
846	WAUZIOZIOPPR	295	14.75	0	261	13.05	0	0	0.0000
847	WCLMGNPULSTI	262	5.24	0	230	4.6	0	0	0.0000
848	WCRRSSPHBPOC	223	11.15	0	223	11.15	0	0	0.0000
849	WELFIXMUSPIT	107	16	0	107	16	0	0	0.0000
850	WEMPAD__PTDF	1476	192.62	0	1245	188	0	1	0.8676
851	WEMPADCHVSLA	1559	31.18	0	1340	26.8	0	1	0.0000
852	WEMPADWEMROE	2483	49.66	0	1977	39.54	0	1	0.0000
853	WEMPADZIOARC	1559	31.18	0	1340	26.8	0	1	0.0000
854	WEMPADZIOPLP	1559	31.18	0	1340	26.8	0	1	0.0000
855	WEMROE__PTDF	1542	77.1	0	1098	54.9	0	0	0.0000
856	WEMT84CHET82	480	9.6	0	480	9.6	0	1	1.0000
857	WFKFFEGHEWLX	342	6.84	0	302	6.04	0	0	0.0000
858	WHEAMOGIBPET	1195	47.1	0	1195	47.1	0	1	0.4926
859	WHEBRE__PTDF	956	163.12	0	956	163.12	0	1	0.8828
860	WHEBREROCSLL	956	19.12	10	956	19.12	10	1	0.0000
861	WHIMUKCHESIL	403	21.46	0	369	20.78	0	1	0.6449
862	WHNGUIWHNHOR	956	19.12	0	956	19.12	0	0	0.0000
863	WHTXFMONIMAJ	171	22.52	0	171	22.52	0	1	0.8481
864	WHTXFMTOMMAJ	171	22.52	0	171	22.52	0	1	0.8481
865	WLSGRV__PTDF	558	11	0	529	11	0	0	0.0000
866	WLXBRN__PTDF	717	58.52	0	717	58.52	0	1	0.6835
867	WLXBRNBAKBRO	926	18.52	0	926	18.52	0	1	0.0000
868	WMVASLTKYXFM	143	13.66	0	143	13.66	0	1	0.7906
869	WMVASLWMVEWF	143	13.66	0	143	13.66	0	1	0.7906
870	WMVEWF__PTDF	1195	55.7	0	1195	55.7	0	1	0.5709
871	WMVEWFSTFLUT	1195	23.9	0	1195	23.9	0	1	0.0000
872	WNE_WKS	505	75	0	455	75	0	1	1.3333
873	WOOCIMSNGNOR	956	80	0	956	80	0	1	0.0000
874	WORGPC__PTDF	291	20.92	0	129	17.68	5.08	1	0.8541
875	WOROWN__PTDF	186	8.72	0	135	7.7	0	1	0.6494
876	WSTXFMDEQOLV	382	14.94	0	382	14.94	0	1	0.5000
877	WTFMSKMNTBMT	2134	199	0	1942	199	0	0	0.0000
878	WYLCAB__PTDF	3464	173.2	136	3464	173.2	272	0	0.0000
879	WYLSAM__PTDF	1548	245	0	1212	242	0	1	0.8756
880	WYLSAMKAMSCA	1676	34	0	1483	30	0	1	0.0000

881	WYLTID__PTDF	1533	77	0	1193	60	0	0	0.0000
882	WYLX7WYLX5_G	979	48.95	0	979	48.95	0	0	0.0000
883	WYLXF5__PTDF	956	47.8	69	956	47.8	137	0	0.0000
884	WYLXF5BELHAS	1044	52.2	81	1044	52.2	161	0	0.0000
885	WYLXF5HASWYL	1044	52.2	68	1044	52.2	136	0	0.0000
886	WYLXF5WYLX37	1111	150	118	955	150	235	1	0.0000
887	WYLXF5WYLXF7	1111	150	118	955	150	235	0	0.0000
888	WYLXF7__PTDF	892	44.6	69	892	44.6	138	0	0.0000
889	WYLXF7BELHAS	979	48.95	81	979	48.95	162	0	0.0000
890	WYLXF7HASWYL	979	48.95	69	979	48.95	138	0	0.0000
891	WYLXF7KAMXFM	979	48.95	84	979	48.95	167	0	0.0000
892	WYLXF7KYSXF3	910	45.5	0	798	39.9	0	1	0.0000
893	WYLXF7WYLXF5	853	150	118	742	150	236	0	0.0000
894	WYLXM5PERASB	1044	52.2	0	911	45.55	0	0	0.0000
895	WYLXM5WYLXM7	1111	150	118	955	150	235	0	0.0000
896	WYLXM7PERASB	853	42.65	0	742	37.1	0	0	0.0000
897	WYLXM7WYLXM5	853	150	118	742	150	236	0	0.0000
898	XENWMV__PTDF	1195	120	0	998	116.06	0	1	0.8280
899	XENWMVCOFRXF	1195	23.9	0	1102	22.04	0	1	0.0000
900	ZIMPUN__PTDF	1519	30.38	0	1519	30.38	0	0	0.0000
901	ZIMSGRZIMPUN	1793	69.66	12	1693	67.66	12	1	0.4996
902	ZIOARC__PTDF	1255	25.1	0	1096	21.92	0	1	0.0000
903	ZIOARCZIOPLP	1434	28.68	0	1096	21.92	0	1	0.0000
904	ZIOLKVZIOADN	2178	43.56	0	1927	38.54	0	1	0.0000
905	ZIOPLP__PTDF	1255	406.7	0	1096	403.52	0	1	0.9457
906	ZIOPLPWEMPAD	1434	28.68	0	1096	21.92	0	1	0.0000
907	ZIOPLPWR__CE	1434	28.68	0	1096	21.92	0	1	1.0000
908	ZIOPLPWR_ATC	1434	28.68	0	1096	21.92	0	1	0.0000
909	ZIOPLPZIOARC	1434	28.68	0	1096	21.92	0	1	0.0000

Attachment 5a

Determination of Available Transfer Capability Within The Western Interconnection

June 2001

Rocky Mountain Operation and Planning Group
Northwest Regional Transmission Association
Southwest Regional Transmission Association
Western Regional Transmission Association
Western Systems Coordinating Council

CONTENTS

Determination of Available Transfer Capability Within the Western Interconnection

1. Introduction

Members of the Regional Transmission Groups (RTGs) and other entities in the Western Interconnection are obligated to provide information to their members and the public regarding Available Transfer Capability (ATC) for transmission paths, in accordance with National Electric Reliability Council (NERC) and Western Systems Coordinating Council (WSCC) standards, the Regional Transmission Group (RTG) Governing Agreements, the Federal Energy Regulatory Commission (FERC) Order 888 Open Access Tariffs, and FERC Order 889. In addition, NERC and FERC are looking for additional industry development of definitive methods for determining ATC.

Transmission Providers in the Western Interconnection will determine ATC in accordance with the NERC document "Available Transfer Capability Definitions and Determination". This Western Interconnection methodology document provides more detail and specific methodology for ATC determination based on commercial practices in the Western Interconnection. The methodology builds upon the Rated System Path based method that is used for determining Total Transfer Capability (TTC) in the Western Interconnection and is intended to fully comply with all NERC, WSCC, RTG and FERC rules regarding ATC. It provides additional details, principles, and reasonableness tests upon which a broad membership consensus has been reached. The Rated System Path Methodology is described in Appendix B of the NERC Report, "Available Transfer Capability Definitions and Determinations."

The Parties to this document acknowledge that given industry restructuring the California Independent System Operator (CaISO) and other future RTOs may have different operational protocols for calculating transmission availability. The CaISO is a non-profit public benefit corporation organized under the laws of the State of California. The CaISO is responsible for the reliable operation of a grid comprising the transmission systems of Pacific Gas & Electric Company, Southern California Edison Company and San Diego Gas & Electric Company. The CaISO, pursuant to its approved Tariff by the FERC, provides open and non-discriminatory transmission access to the market participants in its Day Ahead, Hour Ahead and Real Time Markets. Under that Tariff, CaISO follows different criteria for TTC, TRM and CBM allocations.

2. Methodology and Implementation

This document describes the Western Interconnection's regional practice and methodology for the determination of ATC. It is intended to be the Western Interconnection's standard reference document for the determination of ATC. This methodology is intended to be consistent with the requirements of NERC ATC standards. The use of ATC will be governed by the Transmission Providers' tariffs developed consistent with FERC published decisions, policies and regulations. Disputes between participants will be addressed through the process provided in the tariff or through other applicable dispute resolution processes (i.e., RTG, WSCC, other).

Each Transmission Provider's ATC methodology document shall be reviewed periodically by WSCC to ensure the procedures and practices described in their documents are consistent with the Western Interconnection ATC document and NERC standards as relates to reliability of the interconnected system. This periodic review shall not include the assessment of the Transmission

Provider's implementation of its transmission services tariff but shall verify reliability standards are observed while providing transmission services.

3. Applicability

This document and the methodology herein, apply to all members of the Parties in accordance with their governing authorities**.** Individual Transmission Provider variances from this methodology will be requested by the Transmission Provider and approved by the appropriate organization (FERC, Regional Transmission Association, or WSCC).

4. Scope

This document governs only the methodology for determination of ATC and required frequency for updating ATC. The obligation of participants to post ATC on an OASIS should be in accordance with FERC Orders 888 and 889 or their successor documents.

5. Purpose

The purpose of this document is to ensure consistent implementation within the Western Interconnection of the definition and determination of ATC. For the Members of these organizations, it is intended to supplement the WRTA Governing Agreement, NRTA Governing Agreement and SWRTA Bylaws (collectively, "RTG Governing Agreements"), which broadly define ATC and outline a method for requesting transmission service.

This document builds upon and supplements the rules, definitions, principles and processes delineated in the following:

- NERC Report on Available Transfer Capability Definitions and Determination (June 1996).
- NERC Report on Transmission Transfer Capability (May 1995)
- NERC Transfer Capability Margins Standard (proposed, add issue date when finalized*)*
- WSCC Procedures for Regional Planning Project Review and Rating Transmission Facilities (original dated March 1995)
- FERC Order 888 or successor documents (Open Access Tariffs) (original dated April 1996)
- FERC Order 889 or successor documents (Open Access Same-Time Information Systems) (original dated April 1996)
- Western Regional Transmission Association Governing Agreement (January 1995)
- Northwest Regional Transmission Association Governing Agreement (February 1995)
- Southwest Regional Transmission Association Bylaws (June 1995)
- Joint Transmission Access Principles (CCPG) (December 1991)

Summaries of any information contained in any of the documents listed above are not intended to imply any deviation from the contents of those documents.

6. Determination of ATC

The process for determining ATC for each Transmission Provider in a path should be reasonable, auditable and supportable. It consists of three steps: (1) the determination of path Total Transfer Capability (TTC), (2) the allocation of TTC among Transmission Providers, and (3) the determination of each Transmission Provider's Committed Uses. A Transmission Provider's ATC is then determined by subtracting Committed Uses from allocated TTC.

ATC = TTC (allocated) - Committed Uses

Using NERC ATC terminology,

Committed Uses = TRM + Existing Transmission Commitments (including CBM)

where TRM = Transmission Reliability Margin
CBM = Capacity Benefit Margin

For information on the determination of ATC and the related operating and planning relationships, refer to the NERC document, "Available Transfer Capability - Definitions and Determination" specifically the Sections entitled Determination of Available Transfer Capability, page 15, Commercial Components of Available Transfer Capability, pages 15 to 18, and Non-Recallable (Firm) and Recallable (Non-firm) Relationships and Priorities, pages 18 to 21.

ATC shall be calculated with the following frequencies:

- Hourly ATC for the next 168 hours: Once per day
- Daily ATC for the next 30 days: Once per week
- Monthly ATC for months 2 through 13: Once per month

Transmission Providers should use the best assumptions available for all TTC and ATC calculations. Calculations for hourly ATC within the current week should take into account the load variations during the day, any partial day outages, and best estimates of probable unscheduled flow and location of operating reserves. Daily calculations will use only peak loading for the day, and have to take into acount all partial day outages. Monthly calculations will use broader based assumptions such as monthly peak, accounting for all major outages during the month, and less specific estimates of unscheduled flow and location of operating reserves.

Generally in the Western Interconnection, netting of reservations and schedules cannot be used to increase firm ATC. There is one exception to this general rule which can be implemented on a case-by-case basis when the Transmission Provider, at its sole discretion, determines that they can do so without degrading system reliability. This exception can be invoked if there is firm load on one side of the path in question and the generation resources scheduled to serve it are on the other side of the path. Firm ATC across the path in the direction from the load to the generator can be increased by the scheduled amount from the generator to the load minus an adjustment for operating reserves and back up resources. This adjustment is determined by the location of the operating reserves and back up resources that would be deployed if the original resources serving the load were lost. Each application of this exception must be carefully analyzed based upon the specific circumstances before firm netting is employed. See Appendix I for an illustration and more details.

Parties seeking ATC on constrained paths should contact the Transmission Provider who will then work with generators on the Transmission Provider's system to assess its ability to make ATC available through redispatch and the costs associated with the redispatch, consistent with the Transmission Provider's tariff. If the constraint is related to a nomogram limitation, parties may utilize applicable nomogram market mechanism procedures.

6.1 Determination of Total Transfer Capability (TTC)

TTC represents the reliability limit of a transmission path at any specified point in time. It is a variable quantity, dependent upon operating conditions in the near term and forecasted conditions in the long term. TTC shall be calculated consistent with the requirements of FERC Orders 888 and 889 and as needed to represent system conditions, but no less frequently than seasonally. TTC cannot exceed the path rating. Within the Western Interconnection, a wide area approach is used to determine TTC on a path basis using the Rated System Path method discussed in WSCC's "Procedures for Regional Planning Project Review and Rating Transmission Facilities" and NERC's "Report on Available Transfer Capability Definitions and Determination". The determination of TTC is required to conform with WSCC's "Procedures for Regional Planning Project Review and Rating Transmission Facilities" and WSCC's "Minimum Operating Reliability Criteria". Specific system operating conditions (system topology, load/generation patterns, simultaneous path loadings, and facility outages) may require that TTC or TRM be adjusted to maintain system reliability.

TTC may sometimes be better defined by a nomogram, a set of nomograms, or a series of equations than by a single number, particularly when determining TTC values for two or more parallel or interacting paths. Where the simultaneous transfer capabilities of paths are limited by the interactions between paths, the Transmission Provider should make this known on the OASIS. This may be done by posting non-simultaneous TTC and subtracting TRM, where TRM includes the difference between non-simultaneous and simultaneous limits. As an alternative to computing TRM, the Transmission Provider may post non-simultaneous TTC and describe on the OASIS the nomogram and associated curtailment conditions. In either case, Firm ATC should be based on the best estimate of the simultaneous capability of the path during the period posted.

The total net schedules on a Path are not to exceed the Path TTC.

6.2 Allocation of TTC

When multiple ownership of transmission rights exists on a path or parallel/interacting paths, it is necessary to reach agreement on the allocation of those transmission rights in order to determine and report ATC.[1] A single TTC number, appropriate for the actual or projected condition of the transmission system, will be agreed upon for the path and this TTC will then be allocated between the Transmission Providers, to yield each Transmission Provider's share of the path's TTC for the ATC posting period.

If the Transmission Providers can't come to an agreement amongst themselves, the WSCC and the RTGs in the Western Interconnection provide several dispute resolution forums through which path rating and allocation issues may be addressed.

[1] The allocation rules may address allocations for both normal conditions and system outage conditions.

6.3 Determination of Committed Uses

This section describes the principles, practices and methodology for the determination of Committed Uses[2] in terms of the NERC components of TRM, Existing Transmission Commitments and CBM.

6.3.1 Principles for Determination of Committed Uses

This document adopts an approach for addressing the determination of Committed Uses.

The key to the successful implementation of this approach is development of specific principles, guidelines and reasonableness tests that will be used by Transmission Providers in making their assumptions and determinations of Committed Uses and will provide guidance for dispute resolution proceedings.

Transmission Providers will be expected to:

- Use reasonable, "good-faith" assumptions, consistent with general principles outlined in this document
- Make those assumptions and the underlying justifications for those assumptions available, in accordance with NERC and WSCC standards, the RTA Governing Agreements, FERC Order 888 and FERC Order 889 or their successor documents.
- Justify such assumptions and results, if called upon to do so, in applicable dispute resolution forums, (i.e. FERC 888 tariff process and RTG, WSCC or other dispute resolution processes).
- Adopt assumptions which are consistent with documented and consistently applied reliability requirements, including WSCC Minimum Operating Reliability Criteria, WSCC Power Supply Design Criteria, WSCC Reliability Criteria for System Planning, and the transmission provider's documented and consistently applied internal reliability criteria.
- Apply all assumptions comparably, non-discriminatorily and reasonably. A Transmission Provider's assumptions and methodologies, taken as a whole, must be consistently applied in the treatment of all Transmission Customers in a comparable and non-discriminatory manner.

[2] Committed Uses, as described in the RTA Bylaws, are composed of (1) native load uses, (2) prudent reserves, (3) existing commitments for purchase/exchange/deliveries/sales, (4) existing commitments for transmission service and (5) other pending potential uses of transfer capability.

- Use assumptions and methodologies that facilitates market participation, provided that the outcome meets transmission system reliability requirements and does not impose uncompensated transmission services costs on the Transmission Provider.

- A Transmission Provider's assumptions and methodologies for determining ATC must be consistent with the assumptions used by the Transmission Provider in other aspects of its business (for example, system planning).

6.3.2 Determination of Transmission Reliability Margin (TRM)

TRM is the amount of transmission transfer capability necessary to provide a reasonable level of assurance that the interconnected transmission network will be secure under a broad range of uncertainties in system conditions. TRM accounts for the inherent uncertainty in system conditions and system modeling, and the need for operating flexibility to ensure reliable system operation as system conditions change.

The benefits of TRM extend over a large area and possibly over multiple providers. TRM results from uncertainties that cannot reasonably be mitigated unilaterally by a single provider. In accordance with the terms and conditions of the Transmission Provider's tariff, TRM may be sold on a non-firm basis providing that reliability of the system is not jeopardized. TRM should not be sold as firm.

Each Transmission Provider should make its TRM values and calculation methodology publicly available. The TRM requirement should be reviewed and appropriate updates made by the TPs at a minimum prior to each Operating Season.

In the Western Interconnection methodology, firm ATC reductions associated with TRM may include the following components. TRM may be set to zero.

- Transmission necessary for the activation of operating reserves

- unplanned transmission outages (for paths in which contingencies have not already been considered in establishing the path rating)

- simultaneous limitations associated with operation under a nomogram

- loading variations due to balancing of generation and load

- uncertainty in load distribution and/or load forecast [3]

- allowances for unscheduled flow

[3] Transmission Provider's allowances for load forecasts uncertainty may be part of TRM provided that: (1) the allowance is available as non-firm service on a comparable and non-discriminatory basis, (2) the allowance reduces the exposure to curtailments to all Transmission Customers with firm reservations on a prorata basis for unanticipated load, and (3) the allowance does not duplicate consideration of uncertainty within the load forecast itself.

Transmission capacity required to implement operating reserve sharing agreements for the period immediately following a contingency and before the market can respond (currently up to 59 minutes following the contingency) are included in TRM.

If the limitation on the use of TRM to 59 minutes would force a Transmission Provider to set aside unnecessary CBM on the same path as the TRM, that Transmission Provider may utilize the TRM beyond the 59 minutes. This would allow the Transmission Provider to maximize the ATC by not needlessly setting aside twice the amount of transmission (TRM and CBM) than is necessary for reliability.

TRM does not include allowances for planned outages and other known transmission conditions which should be included in the calculation of TTC. The Transmission Provider has the option of including the above described components of TRM in either the determination of TRM or TTC, but not in both.

Allowances for transmission contingencies should not be included in TRM for paths which have had an Accepted Rating established, since contingencies are already included in the determination of the Accepted Rating. A Transmission Customer with firm reservations which desires to reduce its risk of pro-rata curtailment must explicitly request a reservation of additional rights. Such rights cannot be reserved under the auspices of CBM or TRM. Where such reserved rights are not scheduled for use, the Transmission Provider is required to make such rights available to other transmission service requesters in accordance with FERC Order 888 rules or their successors.

Regarding nomogram operation, the purpose for applying TRM on paths which are governed by nomograms is to account for the uncertainty in capacity availability created by the existence of the nomogram. This is used to establish the amount of firm ATC the Transmission Provider can offer. The size of this TRM adjustment will vary based on specific circumstances. The Transmission Provider should consider such issues as the frequency which specific nomogram thresholds (such as loading levels on interacting paths, generation levels, ambient temperatures, etc.) are reached and the duration that those conditions exist when determining the TRM adjustment. In cases where an allocation of firm rights has been established between two paths related by a nomogram, the TRM reflects the difference between this firm allocation and the path's TTC. TRM set aside specifically for this nomogram adjustment should be offered as non-firm ATC.

Allowance for generation and load balancing and for uncertainty in load distribution and/or load forecast, should be determined through the use of power flow studies and/or historical operating experience. TRM should not include margin already afforded by the WSCC Reliability Criteria or otherwise accounted for in the determination of TTC.

Unscheduled flow may be handled in either of two ways, either of which is acceptable, provided that the methodology is applied consistently and non-discriminatorily:

- The path can be reserved up to its TTC, without factoring in any estimates of unscheduled flows. In such a case, when unscheduled flows materialize, accommodations and curtailments will be made consistent with the WSCC Unscheduled Flow Mitigation Plan.

- The path operator, using reasonable, auditable, supportable projections, may subtract sufficient transfer capability from TTC, as a component of TRM, to

reduce the need to make curtailments associated with projected unscheduled flows.[4] This should be made available as Non-firm transfer capability in case unscheduled flow is less than anticipated.

One method of presenting TRM is to calculate it as a percentage of TTC. Uncertainties accounted for in TRM become more defined in the operating horizon as compared to the planning horizon. This is reflected in smaller TRM values in the operating time frame.

6.3.3 Determination of "Existing Transmission Commitments"

This section identifies those items to be included in the determination of "Existing Transmission Commitments".

- Reservations for Native Load Growth: Transmission Providers may reserve existing transfer capability needed for reasonably forecasted Native Load growth[5]. Transfer Capability reserved for Native Load growth must be made available for use by others until the time that it is actually needed by the Native Load.

- Where transmission service is reserved for a Network Resource which is a purchase by the Transmission Provider to serve Native Load customers, the reservation should reflect the terms of the purchase (if 50 MW may be scheduled in any hour, then 50 MW of transmission must be reserved for every hour). Where the reservation is made based on the Native Load reliability need, the Transmission Provider must determine the applicable hours of such reliability need based on its load and resource circumstances.

- Native Load Forecasts: ATC determination does not presume the existence of sanctioned forecasts by regulatory agencies, although a Transmission Provider may use such a sanction in arguing the reasonableness of its determination of Committed Uses. In making reservations for Native Load, adjustments may be made for near-term uncertainties (e.g. weather). Long-term forecasts may use both generic and contractually committed resources to meet native load requirements. Transmission Providers must use reasonable assumptions in determining Native Load requirements and make available those assumptions and the resulting conclusions, and be able to justify the reasonableness of those assumptions and the resulting conclusions, as well as their consistency with then-current FERC policies, in applicable dispute resolution proceedings.

- Approved Load Forecast: A publicly-approved load forecast or resource plan is one which has been approved, or reviewed and accepted, by a regulatory agency

[4] Note: the SWRTA Bylaws specifically permit the exclusion of transmission capacity needed to accommodate unscheduled flows, at levels consistent with the WSCC Unscheduled Flow Mitigation Plan. Making allowances for projected unscheduled flows based on assumptions that are appropriate for the time horizon of the ATC estimate would be consistent with making the best technical estimate of ATC, and would therefore be consistent with the NERC ATC report.

[5] See footnote 2.

that is independent of the Transmission Provider. If there is no regulatory-approved forecast/plan, the Transmission Provider may publish its own good-faith forecast/plan (for example, an official Loads & Resources plan). The Transmission Provider must also provide the assumptions, and the underlying justifications for those assumptions, used to develop the forecast/plan, in sufficient detail to permit interested parties to examine and challenge the reasonableness of the forecast/plan in an applicable dispute resolution forum.

Evidence supporting the contention that such a forecast/plan has been made in good faith includes a showing that the forecast/plan produced for the purposes of determining Committed Uses and ATC is consistent with the forecast/plan the Transmission Provider uses in its internal planning of other facilities or for processes distinct from those related to determination of Committed Uses. Where there are differences in the ATC methodology from the internal planning assumptions and criteria they must be explained and be subject to a finding of reasonableness in an applicable dispute resolution forum.

Long-term forecasts generally state a net out-of-area resource requirement, but may not break this requirement down by interconnection path/interface or by time-of-use period. The Transmission Provider may use his discretion to make this breakdown, provided the Transmission Provider uses good faith and provides the underlying justifications. Use of a Transmission Provider's own data, assumptions and contracts for service is probably the most reasonable solution that can be attained unless there is an RTG-approved or WSCC-approved area-wide resource database used by all parties posting ATC. The forecast should distinguish between committed and planned resource purchases.

- Ancillary Services (required as a part of Native Load service): Transfer capability should be reserved under Native Load for those ancillary services required to serve Native Load. These include transfer capability required to supply load regulation and frequency response services. Ancillary services for Operating Reserves are covered under Section 6.3.4.

- Reservations Beyond Reliability-Based Needs: A Transmission Provider may reserve ATC for the import of power which is beyond the amount reserved for reliability needs of their Native Load customers, only to the extent permitted under the FERC's Order 888, or the Transmission Provider's own Open Access Transmission Tariff (OATT) and is otherwise consistent with the Federal Power Act and the FERC's applicable standards and policies then in effect.

  A Transmission Provider's merchant function may reserve transfer capability to serve the non-reliability needs of its customers; however, it is necessary to reserve such capacity pursuant to applicable Network and Point-to-Point OATT similar to any other transmission customer. The Transmission Provider may reserve ATC for the import of power which is beyond the amount reserved for the reliability needs of it's Native Load customers, only to the extent permitted under FERC's Order 888, or the Transmission Provider's

own OATT, consistent with the Federal Power Act and the FERC's applicable standards and policies then in effect.[6]

Consistent with Order 888, or the Transmission Provider's own OATT, a Transmission Provider may reserve either Network or Point-to-Point transmission service for its own resources and power purchases designated to serve Network Load. A Transmission Provider may also use the point-to-point tariff to reserve Firm transmission service where it has not made a purchase commitment. It must take such Firm point-to-point transmission service for its uncommitted purchases under the same terms and conditions of the tariff as it offers to others.

- Existing Commitments: Committed Uses associated with existing commitments at the time of the ATC determination are permissible. Determinations for these types of Committed Uses must be made available and are subject to evaluation upon request and in applicable dispute resolution forums.

- Firm Transmission Reservations for Energy Transactions: Transfer capability for energy transactions that can reasonably be expected to be consummated, such as expected hydro conditions, can be a Committed Use for the Transmission Provider (including an affiliated merchant business) to the extent consistent with the reservation provisions of the approved tariff by purchasing firm point-to-point transmission service from available transfer capability. Such transfer capability can be reserved for expected energy transactions, but must be released for Non-firm uses on a scheduling basis if unused or as otherwise required in accordance with the reservation priorities provided in the Transmission Provider's tariff.

  Economy energy purchases (Non-firm purchases) by the Transmission Provider's merchant function can get service under secondary service for non-network resources on an as available basis at no additional "bookkeeping" charge (Section 28.4 of the FERC Open Access Transmission Tariff). If the Transmission Provider is using this service it should decrement Non-firm ATC for the purchase, but not Firm ATC. Firm point-to-point Transmission Service (PPTS) has reservation and curtailment priority over Secondary Service. Secondary Service has reservation and curtailment priority over Non-firm PPTS. Where the purchases are Firm and meet the requirements of a Network Resource, they qualify for a Firm transmission reservation and would be a decrement from the Firm ATC posting. To reserve Firm ATC for a Non-firm purchase or for where the Transmission Provider's merchant has not secured the purchase commitment or the purchase cannot otherwise qualify as a

[6] Order 888 provides: at page 172 when discussing Reservation of Transmission Capacity, "We conclude that public utilities may reserve existing transmission capacity needed for native load growth and network transmission customer load growth reasonably forecasted within the utilities current planning horizon:" at page 191 when discussing Use of the Tariffs by the Rights Holder, "In the case of a public utility buying or selling at wholesale, the public utility must take service under the same tariff under which other wholesale sellers and buyers take service;" at page 323 when discussing Reservation Priority for Existing Firm Service Customers, "The transmission provider may reserve in its calculation of ATC transmission capacity necessary to accommodate native load growth reasonably forecasted in its planning horizon;" and at page 342 when discussing Network and Point-to-Point Customers' Uses of the System, "However we do not require any utility to take service to integrate resources and loads. If any transmission user (including the public utility) prefers to take flexible point-to-point service, they are free to do so."

Network Resource, the Transmission Provider's merchant must make a reservation of Firm PPTS just like it was any other Transmission Customer.

- Reserving transfer capability over multiple paths to secure capacity for a future undefined resource or purchase: Transmission Providers that have uncommitted purchases or resources as part of their resource plan to serve native load can reserve transfer capability on multiple paths until the uncommitted purchase or resource is defined. In such a case, the Transmission Provider should note on the OASIS that multiple paths are being reserved. If a request for transmission service is received for which there is inadequate ATC as a result of a multiple path reservation, the Transmission Provider should have the first right of refusal for use of the path. If the Transmission Provider exercises this right on a particular path, it should release its reservation on the other (multiple) paths.

- Good Faith Requests: Capacity may be reserved as "existing transmission commitments" for "good faith requests" for transmission service received by a Transmission Provider in accordance with applicable FERC or RTG request for service policy. ATC is decremented as specified by applicable FERC or regional policy.

- Information to be Provided: The following lists the types of assumptions and data that could be used in support of the determination of Committed Uses. Transmission Providers should make available the information used in their calculation of ATC values.

  Far-Term Environment (>1 year)

  - Load forecast
  - Load forecast error (range)
  - Standard for serving load
  - Breakdown of use by path
  - Breakdown of use by Time of Use period
  - Hydro and temperature forecasts
  - DSM, interruptible load assumptions
  - Redundancy of reserved paths
  - Resource outage standards (G-1? G-2?)
  - Resource assumptions (high/low hydro...)
  - Forecasted outages
  - Unit deratings
  - Resource dispatch assumptions
  - Purchases or sales to external parties
  - Wheeling contracts, including listings of Points of Receipt, Points of Delivery, and associated transmission demands at each point.

  Near-Term Environment (<1 month)

  - Standard for probability of serving load
  - Load forecasts (range of temperatures, hydro forecast, etc.)

- Resource outage standards (G-1? G-2?)
- Forecasts of generation
- Short-term wheeling arrangements, including listings of Points of Receipt, Points of Delivery, and associated transmission demands at each point.
- Purchases and sales with external parties.

6.3.4 Determination of Capacity Benefit Margin (CBM)

CBM is the amount of firm transmission transfer capability reserved by Load Serving Entities (LSEs) on the host transmission system where their load and generation resources are located, to enable access to generation from interconnected systems to meet generation reliability requirements. CBM is a uni-directional quantity with identifiable beneficiaries, and its use is intended only for the time of emergency generation deficiencies. CBM reservations may be sold on a non-firm basis.

Reservations should be made according to the applicable Transmission Provider's tariff. The determination of CBM reservations according to this Section 6.3.4 is only for purposes of determining required transmission capacity for generation reliability and is not intended to address any payment obligations associated with such reservations.

Each Transmission Provider should make its CBM values and calculation methodology publicly available, including a description of the procedure for the use of CBM in an energy emergency. Actual usage of CBM should be posted by the Transmission Provider.

The following components and considerations should be included in the determination of CBM. CBM may be set to zero.

- Replacement Reserves :

  Transmission for restoring operating reserves following a generator contingency, generally confined to the time period extending beyond the current scheduling hour that are required above the operating reserve level and are needed to accommodate generation reserves consistent with generation reliability criteria are included in CBM. CBM is only an import quantity and is reserved to meet the Transmission Customer's own potential resource contingencies.

- Reservations of Transmission for Purposes Other than Energy Delivery:

  In certain cases, a Transmission Provider with statutory obligation to serve native load may desire to reserve transmission for purposes other than energy delivery - for example, to provide a path for the import of ancillary services (such as spinning reserves) from another control area; or to allow imports on a different path (in a case where a control area requires a certain amount of unscheduled transfer capability for stability reasons). Similar to reserve sharing arrangements, such reservations are legitimate Committed Uses by a transmission Transmission

Provider to the extent that they are associated with meeting native load reliability requirements (rather than being economics-driven).

- Reservations of additional transfer capability for resource contingencies must be based upon reasonable, publicly available assumptions subject to evaluation in applicable dispute resolution proceedings. The methodology for determining the amount of reserves must be consistent with prudent utility practice, must be clearly documented and consistently followed, must be applied in a non-discriminatory manner, and must be auditable.

- Generation Patterns and Generation Outages:

  Many generation patterns and forced generation outages occur in the power system. These, including the number of generator contingencies, may be considered when determining Committed Uses, to the extent that deductions from ATC associated with these uncertainties use assumptions that are consistent with the planning and service reliability criteria which the Transmission Provider (with native load requirements) uses in serving its customers.[7]

Allowance for CBM generation reliability requirements should be determined in one of two ways, namely (1) using a Loss of Load Expectation (LOLE) probability calculation, or (2) deterministic based upon the largest single contingency. An LOLE of 1 day in 10 years is recommended. This calculation is made using commonly accepted probabilistic generation reliability techniques. The calculation is performed on a monthly basis. The generation requirement is then converted to a CBM requirement for each interconnection based upon historical purchases at peak times, typical load flow patterns and an assessment of adjacent and beyond control area reserves. The generation reliability requirement is updated at least annually.

The CBM requirement should be reviewed and appropriate updates made by the TPs at a minimum prior to each Operating Season.

Individual Transmission Provider CBM Methodologies shall consider in the CBM requirement only generation directly connected to the TP's system being used to serve load directly connected to that system. Generation directly connected to the TP's system which is committed to serve load on another system or which is not committed to serve load on any system shall not be included.

Interruptible load shall be included in the determination of CBM requirements.

[7] As uncertainty in forecasts diminishes, a Transmission Provider must release transmission capacity in a manner that is consistent with prudent utility practice, clearly documented, and consistently followed, applied in a non-discriminatory manner, and auditable.

GLOSSARY

Accepted Rating: a path rating obtained through the WSCC three-phase rating process that is the recognized and protected maximum capability of the path.

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.

CCPG: Colorado Coordinated Planning Group under the umbrella of the Rocky Mountain Operation and Planning Group (RMOPG).

Capacity Benefit Margin (CBM): that amount of transmission transfer capability reserved by Load-Serving Entities with generation on the system up to the purchased/owned amount of transmission, to ensure access to generation from interconnected systems to meet generation reliability requirements.

Committed Uses: Five committed uses described in the RTG Governing Agreements as described in this document.

Curtailability: the right of a Transmission Provider to interrupt all or part of a transmission service due to constraints that reduce the capability of the transmission network to provide the transmission service. Transmission service can be curtailed as per the Transmission Providers OAT or contracts.

Firm Transmission Service: transmission service which cannot be interrupted by the Transmission Provider for economic reasons, but that can be curtailed for reliability reasons. This service is known as Non-Recallable transmission service in the NERC ATC documents.

Load Serving Entity: an entity located within a Transmission Provider's system whose primary function is to provide energy to end use customers. Also known as Energy Service Providers.

Native Load: existing and reasonably-forecasted customer load for which the Transmission Provider - by statute, franchise, contract or regulatory policy - has the obligation to plan, construct or operate its system to provide reliable service. For Transmission Providers not operating in a Retail Access environment, Native Load refers to the load within a Transmission Provider's service territory, to which it is also obligated to provide energy. For Transmission Providers operating in a Retail Access environment, Native Load refers to the load within the Transmission Provider's service territory, independent of the Energy Service Provider(s) serving energy to the load.

Network Resources: Designated resources used by a Transmission Customer to provide electric service to its Native Load consistent with reliability criteria generally accepted in the region.

Non-firm Transmission Service: transmission service which a Transmission Provider has the right to interrupt in whole or in part, for any reason, including economic, that is consistent with FERC policy and the provisions of the Transmission Provider's transmission service tariffs or contract provisions. This service is known as Recallable transmission service in the NERC ATC documents, or service offered on an as-available basis where a higher priority service requester

may displace a lower priority service requester under the terms and conditions of the pro-forma tariff.

NRTA: Northwest Regional Transmission Association.

Operating Season: Those seasons that WSCC requires Operating Transfer Capability Studies to be performed (winter, spring and summer).

Parties: Colorado Coordinated Planning Group, Northwest Regional Transmission Association, Southwest Regional Transmission Association; Western Regional Transmission Association, and Western Systems Coordinating Council.

Recallability: the right of a Transmission Provider to interrupt all or part of a transmission service for any reason, including economic, that is consistent with FERC policy and the provisions of the Transmission Provider's transmission service tariff or contract provisions.

RTG Governing Agreements: Northwest Regional Transmission Association Governing Agreement, Southwest Regional Transmission Association Bylaws, and the Western Regional Transmission Association Governing Agreement.

SWRTA: Southwest Regional Transmission Association.

Total Transfer Capability (TTC): the amount of electric power that can be transferred over the interconnected transmission network in a reliable manner while meeting all of a specific set of defined pre- and post- contingency system conditions.

Transmission Customer: Any eligible customer (or its designated agent) that can or does execute a transmission service agreement or can or does receive transmission service. (FERC Definition – 18 CFR 37.3).

Transmission Provider: Any party that owns, controls, or operates facilities used for the transmission of electric energy in commerce.

Transmission Reliability Margin (TRM): that amount of transmission transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.

WRTA: Western Regional Transmission Association.

WSCC: Western Systems Coordinating Council

APPENDIX I

Standard for the Use of Netting for
Firm ATC Calculations

In general, netting cannot be used to increase firm ATC. There is one exception to this general rule which can be done on a case-by-case basis at the Transmission Provider's discretion, provided that the criteria discussed below are adequately addressed.

If there is firm load on one side of the path in question and the generation resources scheduled to serve it are on the other side of the path, then firm ATC (and associated schedules) in the direction from the load to the generator can be increased by the scheduled amount from the generator to the load minus an adjustment for operating reserves and backup resources. This adjustment is determined by the location of the operating reserves and back up resources that would be deployed if the original resources serving the load were lost.

Any operating reserves or back up resources located on the same side of the path as the original resources maintain the firm counter-schedule, so the ATC in the direction from the load to the generator does not have to be decremented. If the operating reserves or back up resources come from the same side of the path as the load, then the counter-schedule would be lost. The ATC must then be decremented by the amount of these operating reserves and back up resources.

Each application of this exception must be analyzed carefully based upon the specific circumstances before firm netting is employed. A number of factors must be taken into consideration to determine how much of this firm netting can be reasonably allowed over any given transmission path. The factors that must be taken into account when determining the amount of load to net against include:

1. The size of the load. For firm netting, a forecast <u>minimum</u> load level that is reasonable for the time period under consideration should be used. The Transmission Provider must base the firm ATC calculations in these circumstances on a load level that can be expected to be present for the duration of any transactions that are netted against it.

2. Diversity of the load. Is the load a single large load that could be subject to interruption or is the load a diverse load area that has minimal risk of being completely blacked out?

3. Internal generation. Does the load area contain embedded generation resources?

4. Location of operating reserves and back-up resources. If the resources that are serving the load are lost, where will the operating reserves and back-up resources used to replace that generation come from? If they come from the same side of the path as load, then the counter-schedule is lost and there is the possibility that the path could be over-scheduled. Also, the reserves must be able to be deployed fast enough so that WSCC reliability standards for getting actual flows back within transfer limits are met.

Other factors may also need to be taken into account depending on the specific circumstances.

Example of Firm Netting Application:

Assume a path has a transfer capability of 1000MW in the east to west direction.
Assume that there is an actual load of 150MW on the east side of the path and 150MW of generation on the west side of the path that is used to serve it.
Firm east to west transactions of up to 1150MW can be accommodated across the path in the east to west direction since the load "nets out" 150MW due to the firm counter-schedule of the resource used to serve it in the west to east direction.

Approved at the October 25-26 WMIC meeting by WMIC.

Approved at the December 6, 2001 BOT meeting.

Attachment 6a1

When completed, e-mail to: gerry.cauley@nerc.net

Standard Authorization Request Form

Title of Proposed Standard	Revision to Standards MOD 004, MOD005, MOD006, MOD 008, and MOD 009
Request Date	revised February 15, 2006

SAR Requestor Information	**SAR Type** (Put an 'x' in front of one of these selections)	
Name ATCT SAR Drafting Team atctdt_plus@nerc.com	☐	New Standard
Primary Contact Larry Middleton SAR Drafting Team Chair	☐ X	Revision to existing Standard(s)
Telephone (317) 249-5447 Fax	☐	Withdrawal of existing Standard
E-mail lmiddleton@midwestiso.org	☐	Urgent Action

Purpose/Industry Need (Provide one or two sentences)

The existing standards on TRM should be revised to require crisp and clear documentation of the calculation of TRM and make various components of the methodology mandatory so there is more consistency across methodologies.

The existing standards on CBM should be revised to require crisp and clear documentation of the calculation of CBM and make various components (zero values could be acceptable, if applicable) of the methodology mandatory so there is more consistency across methodologies. The Standard drafting team should identify and clarify the various definitions of CBM.

The SAR drafting team will not be addressing the measures, compliance, and regional differences. Those will be reserved for the Standard Drafting Team. The Standard Drafting Team should also consider whether the definitions of CBM and TRM should be revised.

The Standard Drafting Team should coordinate its work with the related proposal for the draft NAESB business practice R05004.

Detailed Description (Provide enough detail so that an independent entity familiar with the industry could draft, modify, or withdraw a Standard based on this description.)

Below is a list of issues/items that should be addressed in the revision to MOD-004, 5, 6, 8, and 9. The SAR drafting team does not believe any of the existing requirements should be eliminated during this revision; however, the SAR drafting team expects some existing requirements may be modified and/or re-organized during the revision.

In addition to the specific changes suggested in the SAR Appendix 1, the revisions to these standards should address these additional issues:

- Cataloging of various uses and interpretations of CBM
    - How should they be differentiated?
- Should CBM be an explicit reservation?
    - How and if it would be made a requirement
    - Would it be source to sink or partial path?
- How it might impact systems that use CBM for resource adequacy?
- Whether there should be a reciprocal agreement for the use of CBM.
- Should CBM be based on required or recommended planning reserve.
- Whether entities should plan and reinforce their systems for the amount of CBM being reserved.
- How would RRO (and NERC?) approve CBM/TRM methodologies
- How should TRM be made consistent with applicable planning criteria?

The SAR drafting team has included suggested changes related to these issues in Appendix 1 to this SAR. These are a result of discussions during the SAR drafting and are provided as information that may aide the standard drafting team during their work.

Reliability Functions

The Standard will Apply to the Following Functions *(Check box for each one that applies by double clicking the grey boxes.)*		
☐x	Reliability Authority	Ensures the reliability of the bulk transmission system within its Reliability Authority area. This is the highest reliability authority.
☐x	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time
☐x	Interchange Authority	Authorizes valid and balanced Interchange Schedules
☐x	Planning Authority	Plans the bulk electric system
☐x	Resource Planner	Develops a long-term (>1year) plan for the resource adequacy of specific loads within a Planning Authority area.
☐x	Transmission Planner	Develops a long-term (>1 year) plan for the reliability of transmission systems within its portion of the Planning Authority area.
☐**x**	Transmission Service Provider	Provides transmission services to qualified market participants under applicable transmission service agreements
☐x	Transmission Owner	Owns transmission facilities
☐x	Transmission Operator	Operates and maintains the transmission facilities, and executes switching orders
☐	Distribution Provider	Provides and operates the “wires” between the transmission system and the customer
☐x	Generator Owner	Owns and maintains generation unit(s)
☐x	Generator Operator	Operates generation unit(s) and performs the functions of supplying energy and Interconnected Operations Services
☐x	Purchasing-Selling Entity	The function of purchasing or selling energy, capacity and all necessary Interconnected Operations Services as required
☐x	Market Operator	Integrates energy, capacity, balancing, and transmission resources to achieve an economic, reliability-constrained dispatch.
☐x	Load-Serving Entity	Secures energy and transmission (and related generation services) to serve the end user

Applicability to be determined by standard drafting team.

Reliability and Market Interface Principles

Applicable Reliability Principles *(Check boxes for all that apply by double clicking the grey boxes.)*	
x☐	Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
☐	The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
☐**x**	Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
☐	Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
☐**x**	Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
☐**x**	Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions.
☐	The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
Does the proposed Standard comply with all of the following Market Interface Principles? *(Select 'yes' or 'no' from the drop-down box by double clicking the grey area.)*	
The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes	
An Organization Standard shall not give any market participant an unfair competitive advantage.Yes	
An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes	
An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

Related Standards

Standard No.	Explanation
t.b.d	LTATF SAR for ATC/AFC and TTC (submitted with this SAR).
R05004	NAESB proposed Business Practice for a single Business Practice Standard.

Related SARs

SAR ID	Explanation
	Resource Adequacy SAR/Standard

Regional Differences

Region	Explanation
ECAR	
ERCOT	
FRCC	
MRO	
NPCC	
RFC	
SERC	
SPP	
WECC	

Related NERC Operating Policies or Planning Standards

ID	Explanation

Appendix 1

proposed changes are highlighted in green

SUGGESTED REVISIONS to MOD-004-0

R1. Each Regional Reliability Organization, in conjunction with its members, shall develop and document a CBM methodology that is approved by the RRO. A Transmission Service Provider that crosses multiple RRO boundaries shall get approval for its CBM methodology either from each of the respective RROs, or from NERC.

Each CBM methodology shall :

R1.1 Specify that the method used to determine generation reliability requirements as the basis for CBM shall be consistent with the respective generation planning criteria.

R1.2 Specify the frequency of calculation of the generation reliability requirement and associated CBM values.

- Require that the calculations must be verified at least annually.
- Require that the dates seasonal CBM values apply must be specified.

R1.3 Require that generation unit outages considered in a transmission provider's CBM calculation be restricted to those units within the transmission provider's system.

[The standard drafting team should discuss whether CBM should be an explicit reservation and how it would be made a requirement.]

R1.4 Require that CBM be preserved only on the transmission provider's system where the load serving entity's load is located (i.e., CBM is an import quantity only).

[The standard drafting team should discuss whether there could be a reciprocal agreement for the use of CBM.]

R1.5 Describe the inclusion or exclusion rationale in the CBM calculation for generation resources of each LSE including those generation resources not directly connected to the transmission provider's system but serving LSE loads connected to the transmission provider's system. The following rationale must be included in all methodologies:

R1.7.1 All generation directly connected to the transmission provider's system being used to serve load directly connected to that system will be considered in the CBM requirement determination.

R1.7.2 The availability of generation not directly connected to the transmission provider's system being used to serve load directly connected to that system would be considered available per the terms under which it was arranged.

R1.6 Describe the inclusion or exclusion rationale for generation connected to the transmission provider's system. The following rationale must be included in all methodologies:

R1.7.1 The following units shall be included in the CBM requirement determination because they are considered to be the installed generation capacity, committed to

serve load, directly connected to the transmission system for which the CBM requirement is being determined:

i. Generation directly connected to the transmission provider's system but not obligated to serve load directly connected to that system, will be incorporated into the CBM requirement determination as follows:

1. Generation directly connected to the transmission provider's system, but committed to serve load on another system, will not be included in the CBM requirement determination for the transmission system to which the generator is directly connected.)

2. Generation directly connected to the TSP's system, but not committed to serve load on any system, will be included in the CBM requirement determination for the transmission system to which the generator is directly connected as follows:

The TSP will use the best information available to them (i.e. confirmed or requested transmission service/no service) to determine how these units should be considered in the CBM requirement determination. All assumptions made must be documented and approved by the entity responsible for the methodology.

R1.7 Describe the formal process and rationale for the RRO to grant any variances to individual transmission providers from the Regional CBM methodology.

R1.7.1 Require any variances must also be approved by NERC or its designate.

R1.8 Specify the relationship of CBM to the generation reliability requirement and the allocation of the CBM values to the appropriate transmission facilities. The sum of the CBM values allocated to all interfaces shall not exceed that portion of the generation reliability requirement that is to be provided by outside resources.

R1.9 Describe the inclusion or exclusion rationale for the loads of each LSE, including interruptible demands and buy-through contracts (type of service contract that offers the customer the option to be interrupted or to accept a higher rate for service under certain conditions).

R1.10 Describe any adjustments to CBM values to account for generation reserve sharing arrangements (i.e. Use of CBM and a reserve sharing event simultaneously occurring that is not planned for). Explain how the simultaneous application of CBM and TRM amounts being implemented in the ATC calculations are being taken into consideration during the planning process.

[The standard drafting team should consider paragraph below:]

R1.11 Require that CBM be based on the required or recommended planning reserve. In other words, a load serving entity that does not arrange for resources at least equal to the recommended or required planning reserve levels does not benefit by causing a higher CBM.

[The standard drafting team should consider the option below:]

R1.12 Require that the appropriate entities will plan and reinforce the transmission system for the amount of CBM being preserved.

R2. The RRO's most recent version of the documentation of each entity's CBM methodology shall be available on a web site accessible by NERC, the RROs, and the stakeholders in the electricity market.

M3. Each RRO, in conjunction with its members, shall develop and implement a procedure to review the CBM calculations and values of member transmission providers to ensure that they comply with the Regional CBM methodology and are periodically updated (at least annually) and available to stakeholders. Documentation of the results of the most current Regional reviews shall be provided to NERC or its designate within 30 days of completion.

- The RRO must review and approve the TSP methodology to ensure it is consistent with the RRO's Planning Criteria. The TSP is responsible for ensuring that CBM calculations are consistent with the individual TOs planning criteria.

SUGGESTED REVISIONS to MOD-005-0

R1. Each Regional Reliability Organization, in conjunction with its members, shall develop and implement a procedure to review (at least annually) the CBM calculations and the resulting values of member Transmission Service Providers. The CBM review procedure shall:

R1.1 Indicate the frequency is at least annual, under which the verification review shall be implemented.

R1.2 Require review of the process by which CBM values are updated, and their frequency of update, to ensure that the most current CBM values are available to stakeholders.

R1.3 Require review of the consistency of the transmission provider's CBM components with its published planning criteria. A CBM value is considered consistent with published planning criteria if the same components that comprise CBM are also addressed in the planning criteria. The methodology used to determine and apply CBM does not have to involve the same mechanics as the planning process, but the same uncertainties must be considered and any simplifying assumptions explained. It is recognized that ATC determinations are often time constrained and thus will not permit the use of the same mechanics employed in the more rigorous planning process. The procedure must specify how the consistency would be verified.

R1.3.1 Require verification that the appropriate entities are planning and reinforcing the transmission system for the amount of CBM being preserved. The procedure must specify how the verification would be determined. Transmission service providers must also perform this verification and report on the findings as specified below.

R1.4 Require CBM values to be updated at least annually and available to the Regions, NERC, and stakeholders in the electricity markets.

R2. The documentation of the Regional CBM procedure shall be available to NERC on request (within 30 days).

R3. Documentation of the results of the most current implementation of the procedure shall be sent to NERC within 30 days of completion.

SUGGESTED **REVISIONS to MOD-008-0**

R1. Each RRO in conjunction with its members, shall jointly develop and document a TRM methodology. This methodology shall be available to NERC, the Regions, and the transmission users in the electricity market. If a RRO's members TRM values are determined by a RTO or ISO, than a jointly developed regional methodology is not required for those members. RRO members not covered by an RTO/ISO would be required to have a regional methodology.

Each TRM methodology shall:

R1.1 Specify the update frequency of TRM calculations.

- Require that calculations be verified at least annually if determined to be required
- Require that dates that seasonal TRM values apply must be specified

R1.2 Specify how TRM values are incorporated into ATC calculations.

R1.3 Specify the uncertainties accounted for in TRM and the methods used to determine their impacts on the TRM values. The following components of uncertainty, if applied, shall be accounted for solely in TRM and not CBM:

R1.3.1 aggregate load forecast error (not included in determining generation reliability requirements).
R1.3.2 load distribution error.
R1.3.3 variations in facility loadings due to balancing of generation within a Balancing Authority Area.
R1.3.4 forecast uncertainty in transmission system topology.
R1.3.5 allowances for parallel path (loop flow) impacts.
R1.3.6 allowances for simultaneous path interactions.
R1.3.7 variations in generation dispatch
R1.3.8 short-term operator response (operating reserve actions not exceeding a 59-minute window).
R1.3.9 Any additional components of uncertainty shall benefit the interconnected transmission systems, as a whole, before they shall be permitted to be included in TRM calculations.
R1.3.10 Additional detail on how variations in generation dispatch are handled from intermittent generation sources such as wind and hydro, need to be provided.

R1.4 Describe the conditions, if any, under which TRM may be available to the market as Non-Firm Transmission Service.

R1.5 Describe the formal process for the granting of any variances to individual transmission service providers from the regional TRM methodology.

R1.5.1 Any variances must also be approved by NERC or its designate

R1.6 Describe the methodology and conditions thereof that are used to reflect if TRM is reduced for the operating horizon.

R1.7 Explain how the simultaneous application of CBM and TRM amounts being implemented in the ATC calculations are being taken into consideration during the planning process.

R1.8 Specify TRM methodologies and values must be consistent with the approved planning criteria.

R1.8.1 Require that the appropriate entities will plan and reinforce the transmission system for the amount of TRM being preserved. The methodology must specify how the verification of the consistency would be determined.

R1.8.2 Each TRM methodology shall address each of the items above and shall explain its use, if any, in determining TRM values. Other items that are entity specific or that are considered in each respective methodology shall also be explained along with their use in determining TRM values.

SUGGESTED **REVISIONS to MOD-009-0**

R1. Each group of transmission service providers/and or AFC/ATC/TTC calculators within a region, in conjunction with the members of that region , in conjunction with its members, shall develop and implement a procedure to review the TRM calculations and resulting values of member transmission providers to ensure that they comply with the regional TRM methodology and are updated at least annually and available to transmission users.

- The RRO must review and approve the transmission service provider(s)' methodology to ensure it is consistent with the RRO's Planning Criteria. The RRO is responsible for ensuring that TRM calculations are consistent with the individual TOs planning criteria.

The TRM review procedure shall:

R1.1 Indicate the frequency is at least annual, under which the verification review shall be implemented.

R1.2 Require review of the process by which TRM values are updated, and their frequency of update, to ensure that the most current TRM values are available to stakeholders.

R1.3 Require review of the consistency of the transmission service provider's or Transmission Owner's TRM components with its published planning criteria. A TRM

value is considered consistent with published planning criteria if the same components that comprise TRM are also addressed in the planning criteria. The methodology used to determine and apply TRM does not have to involve the same mechanics as the planning process, but the same uncertainties must be considered and any simplifying assumption explained. It is recognized that ATC determinations are often time constrained and thus will not permit the use of the same mechanics employed in the more rigorous planning process. The review process used by a transmission service provider or transmission owner also needs to be documented.

R1.3.1 Explain how the simultaneous application of CBM and TRM amounts being implemented in the ATC calculations are being taken into consideration during the planning process.

R1.4 TRM methodologies and values must be consistent with the applicable planning criteria

- The methodology must specify how the verification of the consistency would be determined

R2. The documentation of the regional TRM procedure shall be available to NERC on request (within 30 days). Documentation of the results of the most current implementation of the procedure shall be available to NERC within 30 days of completion.

R3. Documentation of the results of the most current regional reviews shall be provided to NERC within 30 days of completion.

R4. Require TRM values to be verified at least annually and made available to the RROs, NERC, and stakeholders.

Attachment 6a2

R05004A

North American Energy Standards Board

Request for Initiation of a NAESB Business Practice Standard, Model Business Practice or Electronic Transaction
or
Enhancement of an Existing NAESB Business Practice Standard, Model Business Practice or Electronic Transaction

Instructions:

1. **Please fill out as much of the requested information as possible. It is mandatory to provide a contact name, phone number and fax number to which questions can be directed. If you have an electronic mailing address, please make that available as well.**

2. **Attach any information you believe is related to the request. The more complete your request is, the less time is required to review it.**

3. **Once completed, send your request to:**

   Rae McQuade
   NAESB, Executive Director
   1301 Fannin, Suite 2350
   Houston, TX 77002

   Phone: 713-356-0060
   Fax: 713-356-0067

   by either mail, fax, or to NAESB's email address, naesb@naesb.org.

Once received, the request will be routed to the appropriate subcommittees for review.

Please note that submitters should provide the requests to the NAESB office in sufficient time so that the NAESB Triage Subcommittee may fully consider the request prior to taking action on it. It is preferable that the request be submitted a minimum of 3 business days prior to the Triage Subcommittee meetings. Those meeting schedules are posted on the NAESB web site at http://www.naesb.org/monthly_calendar.asp.

North American Energy Standards Board

Request for Initiation of a NAESB Business Practice Standard, Model Business Practice or Electronic Transaction
or
Enhancement of an Existing NAESB Business Practice Standard, Model Business Practice or Electronic Transaction

Date of Request: ___ December 12, 2005_____

1. Submitting Entity & Address:

   _____

   __ATCT_SAR_Drafting_Team_____
   _____
   _____

2. Contact Person, Phone #, Fax #, Electronic Mailing Address:

   Name : _____
   Title : _____
   Phone : _____
   Fax : _____
   E-mail : _ **atct_plus@nerc.com**_____

3. Description of Proposed Standard or Enhancement:

   It is proposed that the following items be addressed by either modifying NAESB Business Practice for Open Access Same-time Information Systems (OASIS) WEQ BPS-001-000, WEQSCP-001-000, and WEQDD-001-000 be modified or developing a new business practice standard(s) as required:

   1) the processing of transmission service requests, which use TTC/ATC/AFC,in coordination with NERC changes to MOD-001, such as:

      a. where the allocation of flowgate capability based on historical Network Native Load impacts the evaluation of transmission service requests, requiring the posting of those allocation values in conjunction with queries of service offerings on OASIS (new requirement)

      b. granting of partial service by capacity requested, both partial period and partial MW (for example WEQSCP-001-4.2.13.2)

c. defining methodology for determining prioritization of competing requests for bumping and matching (for example WEQBPS-001-4.18 and WEQSCP-001-4.2.13.6)

d. defining whether contract path (for systems using flow-based analysis) is between control areas or between Transmission Service Providers (new requirement, would not apply to Western or ERCOT interconnections).

2) the processing of transmission service requests, which use CBM/TRM

a. including the amount of CBM to be made available as Non-firm Transmission Service (for example, WEQSCP-001-4.5).

3) Additional Items required in the NOPR on Preventing Undue Discrimination and Preference in Transmission Service (Docket No. RM05-25-000 and RM05-17-000) that have not been identified as requirements for complementary business practices to the reliability standards for ATC:

a. Any required additional OASIS posting requirements to document methodologies that are developed(Paragraph 155)

b. NAESB companion business practices for ETC (Paragraph 158)

i. NERC has identified the ETC definition to be included in the ATC calculation

c. Additional OASIS business practices for the posting of information in native load use of transmission (Paragraph 158)

i. Business practices developed may include standards for transmission commitments, specifically components to be included in ETC

d. CBM OASIS business practice development will be required (NERC is developing reliability standards to support CBM) and:

I. business practices for a new OASIS transaction that allows an LSE to "call" on CBM (Paragraph 161)

II. business practices for a separate rate schedule for CBM set-aside (Paragraph 162)

III. business practices for new transfer capability reservation for designated network resources (Paragraph 163)

e. business practices for calculation and frequency of posting ATC calculations (Paragraph 168)

f. business practices for existing transmission reservations including counterflows, ATC calculation frequency, and Source/sink modeling identification (Paragraph 169)

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g. informational postings to complement the reliability standards MOD-001 for development of consistent methodologies for ATC/TTC/AFC. Development of business practices to determine which information should be posted to support ATC/TTC/AFC (Paragraph 181)

h. provide the mechanism for a standardized navigation to access the narrative explanations for changes in ATC values. (Paragraph 186)

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4. Use of Proposed Standard or Enhancement (include how the standard will be used, documentation on the description of the proposed standard, any existing documentation of the proposed standard, and required communication protocols):

   a. The proposed standard will be applicable to transmission service providers to ensure that consistent practices are employed among transmission service providers when processing requests for transmission service,

   b. Each Transmission Service Provider TSP should, assure comparability of service for long term firm point to point and network service customers; and

   c. The proposed standard will be applicable to transmission service providers to ensure that details of the practices and procedures are available to market participants.

5. Description of Any Tangible or Intangible Benefits to the Use of the Proposed Standard or Enhancement:

   Providing increased standardization of procedures and better informing market participants of these procedures would enhance market liquidity.

   Additionally, this should result in better utilization of the transmission system.

6. Estimate of Incremental Specific Costs to Implement Proposed Standard or Enhancement:

   t.b.d.

7. Description of Any Specific Legal or Other Considerations:

Development of this Business Practice needs to be closely coordinated with any work undertaken by NERC that impacts the calculation and coordination of AFC/ATC.

NERC's Long Term ATC/AFC TF (LTATF), which included NAESB participation, has identified a number of issues related to the calculation and coordination of ATC and AFC. .

It is recommended that NAESB develop a Business Practice Standard that would ensure full disclosure by which Transmission Service Providers (TSPs) determine the quantity of transmission service to be made available for sale to market participants.

8. If This Proposed Standard or Enhancement Is Not Tested Yet, List Trading Partners Willing to Test Standard or Enhancement (Corporations and contacts):

N/A

9. If This Proposed Standard or Enhancement Is In Use, Who are the Trading Partners:

N/A

10. Attachments (such as : further detailed proposals, transaction data descriptions, information flows, implementation guides, business process descriptions, examples of ASC ANSI X12 mapped transactions):

Please see final Long Term AFC/ATC Task Force report on the NERC website at:

ftp://www.nerc.com/pub/sys/all_updl/mc/ltatf/LTATF_Final_Report_Revised.pdf

Attachment 6a3

DRAFT

CBM: Does it help or hinder reliability?

*This is **the minority opinion** of the ATCT Drafting Team. Although this paper may not apply to all Transmission Service Providers (TSPs), it does apply to several in the eastern interconnection.*

The design of the Capacity Benefit Margin (CBM) product as it is today does little to enhance reliability. In fact, one could deduce that the preservation of CBM actually hinders reliability. CBM is intended to be an instrument to ensure the availability of transmission during a local generation resource shortage, but until the industry can agree to coordinate these efforts, the result may be making things worse instead of better. In fact, current interpretations of the calculation and use of CBM by several TSPs cause several concerns:

1. **CBM is a partial path reservation without a designated generation source.**

   CBM is an import quantity only. There are no arrangements between TSPs for the reservation and use of CBM on neighboring transmission systems. This means that when CBM is being utilized on a TSP's system during emergency conditions, there still needs to be arrangements made with all external TSPs for the use of *their* transmission systems. There is absolutely no assurance that the transmission service will be available on that other TSP's system. Furthermore, since emergencies occur in real-time, firm service is not available due to timing requirements. In fact, the only service that is available is non-firm hourly service or non-firm secondary service. With TLR occurrences being the rule, rather than the exception, the risk of curtailment of the emergency import is very probable due to the use of non-firm transmission. There are currently no provisions in either the TLR procedure or any TSPs tariff that allow for special treatment for external Load Serving Entities (LSEs) to use their system for emergency (CBM) purposes. In addition to the transmission availability risk, there is also no assurance that generation resources will be available on the interfaces (or impact flowgates) on which CBM is reserved.

2. **Use of CBM can restrict adequate resource planning.**

   Another problem with the current CBM methodology employed by some TSPs is that a LSE that expects to have a capacity deficit is now less likely to be able to make a long-term capacity purchase to ensure resource adequacy. The shortage can almost be seen as a self-fulfilling prediction. The LSE may be forecasting a shortage based on a Loss of Load Expectation (LOLE) calculation, so CBM is added to the interface (or flowgates) to ensure deliverability during emergencies. Since CBM is on the interface (or flowgates), the LSE can not get firm transmission service to purchase capacity and is forced into an emergency situation. This seems to be an illogical approach and does not appear to be in the best interest of the LSEs who are trying to hedge against generation shortages and price risk.

The opposite problem can also occur. The LSE (or TSP) may calculate a CBM of 100 MW to maintain the correct LOLE and later the LSE can make a firm transmission and generation purchase (import) of 25 MW. The CBM should actually be decremented by 25 MW down to 75 MW. However, the CBM may not be calculated every time an LSE makes a firm capacity purchase. In this case, the CBM requirement would be 75 MW, but the TSP is reserving 100 MW. This would limit others from making firm economic purchases to hedge against price risk. Again, this is not in the best interest of the LSEs.

3. LSEs that can choose which interfaces to reserve CBM could restrict competition in that area.

Some TSPs have affiliated LSEs and allow LSEs to determine which interfaces utilize CBM. A TSP's decision to set aside transmission capacity for emergency imports pursuant to either long-term reserve sharing arrangements or probabilistic LOLE calculations reduces the firm import capacity available to its competitors. Whether to reduce ATC/AFC for a CBM reservation, at which interface and in what amount, is a competitively significant decision that is driven by commercial choices which may be made by the large incumbent LSE. It reflects tradeoffs made by the LSE (and its generation/merchant function) as to reliance on internal vs. external generation for sources of energy and reserves. This procedure invites abuse.

4. CBM should not be used as a substitute for "real" reserves.

There could be cases where LSEs are physically "short" real reserves, but use CBM to justify resource adequacy.

Clearly, the current use of CBM has questionable reliability value. The lack of transparency, standardization, and auditable definition, coupled with the absence of procedures for CBM to be reserved and paid for like other transmission reservations, invites abuse. It also may provide a false sense of security that CBM will provide the transmission needed to import emergency generation.

Proposed Solution

The current use of CBM by some TSPs should be discontinued. Today, Capacity Benefit Margin (CBM) is defined as:

The amount of firm transmission transfer capability preserved by the transmission provider for load-serving entities (LSEs), whose loads are located on that transmission 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.

For some LSEs, the current use of CBM may be better than no CBM (although it may be harming some LSEs). Instead of setting aside CBM on a TSP's system as a reliability quantity without the appropriate charges, it would be more reasonable and reliable to require the LSE(s) to obtain a firm transmission path from source to sink and obtain contracts from outside generation to ensure resource adequacy.

Those entities that currently allow for the use of CBM to reduce generation reliability requirements would be better served by this approach than the CBM approach which "assumes" that uncommitted external resources will be there when you need them. This ensures that not only is transmission available in the event of an emergency, but generation will also be available because it is contracted for. It also assigns the cost of the transmission reservations and the cost of capacity to the LSE(s) who directly benefit. A CBM "assumption" about external capacity may be an unrealistic expectation in this time of shrinking capacity margins.

A. Introduction

1. **Title:** **Transfer Capability Methodology**

2. **Number:** FAC-012-1

3. **Purpose:** To ensure that Transfer Capabilities used in the reliable planning and operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.

4. **Applicability**

   4.1. Reliability Coordinator required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities

   4.2. Planning Authority required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities

5. **Effective Date:** August 7, 2006

B. Requirements

R1. The Reliability Coordinator and Planning Authority shall each document its current methodology used for developing its inter-regional and intra-regional Transfer Capabilities (Transfer Capability Methodology). The Transfer Capability Methodology shall include all of the following:

R1.1. A statement that Transfer Capabilities shall respect all applicable System Operating Limits (SOLs).

R1.2. A definition stating whether the methodology is applicable to the planning horizon or the operating horizon.

R1.3. A description of how each of the following is addressed, including any reliability margins applied to reflect uncertainty with projected BES conditions:

R1.3.1. Transmission system topology

R1.3.2. System demand

R1.3.3. Generation dispatch

R1.3.4. Current and projected transmission uses

R2. The Reliability Coordinator shall issue its Transfer Capability Methodology, and any changes to that methodology, prior to the effectiveness of such changes, to all of the following:

R2.1. Each Adjacent Reliability Coordinator and each Reliability Coordinator that indicated a reliability-related need for the methodology.

R2.2. Each Planning Authority and Transmission Planner that models any portion of the Reliability Coordinator's Reliability Coordinator Area.

R2.3. Each Transmission Operator that operates in the Reliability Coordinator Area.

R3. The Planning Authority shall issue its Transfer Capability Methodology, and any changes to that methodology, prior to the effectiveness of such changes, to all of the following:

R3.1. Each Transmission Planner that works in the Planning Authority's Planning Authority Area.

R3.2. Each Adjacent Planning Authority and each Planning Authority that indicated a reliability-related need for the methodology.

R3.3. Each Reliability Coordinator and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.

R4. If a recipient of the Transfer Capability Methodology provides documented technical comments on the methodology, the Reliability Coordinator or Planning Authority shall provide a documented response to that recipient within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Transfer Capability Methodology and, if no change will be made to that Transfer Capability Methodology, the reason why.

C. Measures

M1. The Planning Authority and Reliability Coordinator's methodology for determining Transfer Capabilities shall each include all of the items identified in FAC-012 Requirement 1.1 through Requirement 1.3.4.

M2. The Reliability Coordinator shall have evidence it issued its Transfer Capability Methodology in accordance with FAC-012 Requirement 2 through Requirement R2.3.

M3. The Planning Authority shall have evidence it issued its Transfer Capability Methodology in accordance with FAC-012 Requirement 3 through Requirement 3.3.

M4. If the recipient of the Transfer Capability Methodology provides documented comments on its technical review of that Transfer Capability Methodology, the Reliability Coordinator or Planning Authority that distributed that Transfer Capability Methodology shall have evidence that it provided a written response to that commenter in accordance with FAC-012 Requirement 4.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization

1.2. Compliance Monitoring Period and Reset Timeframe

Each Planning Authority and Reliability Coordinator shall self-certify its compliance to the Compliance Monitor at least once every three years. New Planning Authorities and Reliability Coordinators shall each demonstrate compliance through an on-site audit conducted by the Compliance Monitor within the first year that it commences operation. The Compliance Monitor shall also conduct an on-site audit once every nine years and an investigation upon complaint to assess performance.

The Performance-Reset Period shall be twelve months from the last finding of non-compliance.

1.3. Data Retention

The Planning Authority and Reliability Coordinator shall each keep all superseded portions to its Transfer Capability Methodology for 12 months beyond the date of the change in that methodology and shall keep all documented comments on the Transfer Capability Methodology and associated responses for three years. In addition, entities found non-compliant shall keep information related to the non-compliance until found compliant.

The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

The Planning Authority and Reliability Coordinator shall each make the following available for inspection during an on-site audit by the Compliance Monitor or within 15 business days of a request as part of an investigation upon complaint:

1.4.1 Transfer Capability Methodology.

1.4.2 Superseded portions of its Transfer Capability Methodology that have been made within the past 12 months.

1.4.3 Documented comments provided by a recipient of the Transfer Capability Methodology on its technical review of the Transfer Capability Methodology, and the associated responses.

2. Levels of Non-Compliance

2.1. Level 1: There shall be a level one non-compliance if either of the following conditions exists:

2.1.1 The Transfer Capability Methodology is missing any one of the required statements or descriptions identified in FAC-012 R1.1 through R1.3.4.

2.1.2 No evidence of responses to a recipient's comments on the Transfer Capability Methodology.

2.2. Level 2: The Transfer Capability Methodology is missing a combination of two of the required statements or descriptions identified in FAC-012 R1.1 through R1.3.4, or a combination thereof.

2.3. Level 3: The Transfer Capability Methodology is missing a combination of three or more of the required statements or descriptions identified in FAC-012 R1.1 through R1.3.4.

2.4. Level 4: The Transfer Capability Methodology was not issued to all of the required entities.

E. Regional Differences

None identified.

Version History

Version	Date	Action	Change Tracking
1	08/01/05	1. Lower cased the word "draft" and "drafting team" where appropriate. 2. Changed incorrect use of certain hyphens (-) to "en dash" (–) and "em dash (—)." 3. Changed "Timeframe" to "Time Frame" in item D, 1.2.	01/20/06

A. Introduction

1. Title: **Establish and Communicate Transfer Capabilities**

2. Number: FAC-013-1

3. Purpose: To ensure that Transfer Capabilities used in the reliable planning and operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.

4. Applicability

4.1. Reliability Coordinator required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities

4.2. Planning Authority required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities

5. Effective Date: October 7, 2006

B. Requirements

R1. The Reliability Coordinator and Planning Authority shall each establish a set of inter-regional and intra-regional Transfer Capabilities that is consistent with its current Transfer Capability Methodology.

R2. The Reliability Coordinator and Planning Authority shall each provide its inter-regional and intra-regional Transfer Capabilities to those entities that have a reliability-related need for such Transfer Capabilities and make a written request that includes a schedule for delivery of such Transfer Capabilities as follows:

R2.1. The Reliability Coordinator shall provide its Transfer Capabilities to its associated Regional Reliability Organization(s), to its adjacent Reliability Coordinators, and to the Transmission Operators, Transmission Service Providers and Planning Authorities that work in its Reliability Coordinator Area.

R2.2. The Planning Authority shall provide its Transfer Capabilities to its associated Reliability Coordinator(s) and Regional Reliability Organization(s), and to the Transmission Planners and Transmission Service Provider(s) that work in its Planning Authority Area.

C. Measures

M1. The Reliability Coordinator and Planning Authority shall each be able to demonstrate that it developed its Transfer Capabilities consistent with its Transfer Capability Methodology.

M2. The Reliability Coordinator and Planning Authority shall each have evidence that it provided its Transfer Capabilities in accordance with schedules supplied by the requestors of such Transfer Capabilities.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility
Regional Reliability Organization

1.2. Compliance Monitoring Period and Reset Timeframe

The Reliability Coordinator and Planning Authority shall each verify compliance through self-certification submitted to the Compliance Monitor annually. The Compliance

Monitor may conduct a targeted audit once in each calendar year (January–December) and an investigation upon a complaint to assess compliance.

The Performance-Reset Period shall be twelve months from the last finding of non-compliance.

1.3. Data Retention

The Planning Authority and Reliability Coordinator shall each keep documentation for 12 months. In addition, entities found non-compliant shall keep information related to the non-compliance until found compliant.

The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

The Planning Authority and Reliability Coordinator shall each make the following available for inspection during a targeted audit by the Compliance Monitor or within 15 business days of a request as part of an investigation upon complaint:

1.4.1 Transfer Capability Methodology.

1.4.2 Inter-regional and Intra-regional Transfer Capabilities.

1.4.3 Evidence that Transfer Capabilities were distributed.

1.4.4 Distribution schedules provided by entities that requested Transfer Capabilities.

2. Levels of Non-Compliance

2.1. Level 1: Not applicable.

2.2. Level 2: Not all requested Transfer Capabilities were provided in accordance with their respective schedules.

2.3. Level 3: Transfer Capabilities were not developed consistent with the Transfer Capability Methodology.

2.4. Level 4: No requested Transfer Capabilities were provided in accordance with their respective schedules.

E. Regional Differences

None identified.

Version History

Version	Date	Action	Change Tracking
1	08/01/05	1. Changed incorrect use of certain hyphens (-) to "en dash (–)." 2. Lower cased the word "draft" and "drafting team" where appropriate. 3. Changed Anticipated Action #5, page 1, from "30-day" to "Thirty-day." 4. Added or removed "periods."	01/20/05