NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

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

Distribution Factor Working Group Conference Call

Friday, November 11, 2005 —2–3:30 p.m. EST

Agenda

1. Introductions

2. Administrative

a. Review NERC Antitrust Compliance Guidelines
b. Approve and set timing for agenda. Closed sessions will be conducted as required.
c. Approve November 9, 2005 conference call minutes
d. Future meetings and conference calls
   i) Future Meetings
e. Action Item List — *Information*

3. Proxy Flowgates

4. Future of Book of Flowgates

5. Marginal Zone Review

a. PJM
b. SPP

6. Other

7. Adjourn

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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.

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Distribution Factor Working Group

November 9, 2005

Conference Call Minutes

Administrative Matters

Chairman Jim Busbin called the Distribution Factor Working Group (DFWG) conference call to order at 2 p.m. EDT on November 9, 2005. The attendees are listed in Attachment A.

Proxy Flowgates

The DFWG has been asked to examine the use of flowgates as proxies in the IDC for relieving congestion on lower voltage elements. This issue has been brought to the ORS on several occasions, since 2002. However, the ORS has been unable to develop a definition or policy for the use of proxy flowgates. The members of the DFWG concluded that a recommendation to the ORS is necessary, but cannot be made until the frequency and several examples of the use of proxy flowgates are determined. Jeff Norman, Pat Shanahan, Dave Mabry, and John Riley will locate the available information. The DFWG will then meet via conference call on Friday November 11, 2005 to formulate their recommendation on the use of proxy flowgates to the ORS. The DFWG noted that none of the conference call participants represented organizations that use proxy flowgates. Therefore, Jeff Norman will contact those members who are believed to use proxy flowgates in an effort to encourage their participation in the DFWG recommendation.

Winter Base Case

The schedule for the development of the 2005 winter base case was provided to the DFWG by Kannan Sreenivasachar. It is listed below:

Completed	Release of Trial 1
Completed	Release of Trial 2
November 9, 2005	Release of Trial 3
November 15, 2005	Updates to be included in Trial 4 are due.
TBD	Release of Trial 4

The DFWG plans to include three-winding transformers in the winter base case. However, at least one reliability coordinator has stated that their organization may not be ready to submit three-winding transformers.

Book of Flowgates Rewrite

The IDCWG endorsed the attached document entitled Book of Flowgates II on November 3, 2005. On November 16, 2005, the ORS will be asked to support developing a replacement to the existing Book of Flowgates. The DFWG is responsible for maintaining the existing Book of Flowgates. Therefore, the NERC staff is also requesting their endorsement of this project. Due to the limited time available on the conference call, the DFWG agreed to draft a motion for discussion on Friday, November 9, 2005.

Next Call/Meeting

What	Date	Time	Location
Conference Call	November 11, 2005	2–3:30 p.m. EDT	Conference Call

Adjournment

The conference call meeting was adjourned at 3:30 p.m. EST.

Attachment A

Attendance

Name	Representing	E-Mail Address
Jim Busbin, Chairman	SOCO	jybusbin@southernco.com
Jeff Norman	NERC	jeff.norman@nerc.net
Patrick Shanahan	ATC	pshanahan@atcllc.com
Dave Mabry	PJM	mabry@pjm.com
Jason Smith	SPP	jsmith@spp.org
Phillip Shafer	NYISO	pshafeei@nyiso.com
Paul Graves	Progress Energy	Paul.graves@pgnmail.com
John Riley	AEP	jhriley@aep.com
Kannan Sreenivasachar	IESO	kannan.sreenivasachar@ieso.ca

Use of Proxy Flowgates

Discussion and Action

The Transmission Subcommittee and the ORS will discuss this agenda item in joint session.

Background (As Provided by Dan Boezio to Transmission Subcommittee Chairman Scott Moore)

The ORS and RCWG have been debating this issue for years, with no resolution in sight. The ORS created a task force to investigate and propose a solution, and came up with three options that were presented to the ORS in December 2002. However, the task force did not reach a consensus on which option to recommend, so they presented all three options to the ORS. The ORS also could not reach agreement, so it requested the task force to work with the DFWG and come back with a recommendation. The task force has yet to do. Actually, the task force is not active anymore, given that most of the original members have moved on and that the task force has not met in nearly three years.

MISO and TVA, both strong supporters of proxy flowgates, as well as supporters of changing the TLR threshold from 5% or using a variable threshold based upon voltage level, have worked hard to have these ideas incorporated into the TLR Procedure. IDC granularity also comes into play to a small degree. The inability of the industry to move forward with more IDC granularity may be another obstacle in reaching consensus on resolving the proxy flowgate issue.

In addition, this is partly an equity issue — whose transactions should be curtailed for overloaded transmission facilities. Furthermore, it has sparked debate over regional congestion versus local congestion, with the belief that TLR should only be used for regional congestion not local issues. Because of these polarizing issues, neither the task force nor the ORS has reached consensus regarding the use of proxy flowgates

Some history from the minutes of NERC

From the September 2001 SCS (ORS predecessor) — Appendix 9C1A, "Determination of Constrained Facilities and Curtailment Thresholds – Eastern Interconnection." Ben Li presented an overview of the history of the flowgate development process. A copy of his presentation was included with the agenda. Lanny Nickel presented data illustrating how the use of load or generation participation points impacts the calculation of transaction distribution factors.

Mr. Li then summarized the subcommittee discussion by stating:

1. The Appendix provides an opportunity to eliminate the need for proxy flowgates

2. It is difficult to relieve overloads on transmission interconnections

3. The determination of ATCs could be better coordinated

4. The proposal is intended to result in more accurate TLR calculations and it could reduce the number of curtailments using Firm Transmission Service (TLR Level 5)

Garth Arnott moved to suspend consideration of Appendix 9C1A for one year until it can be determined what congestion management would entail under the RTO environment. The motion was approved.

From the December 2001 ORS minutes — Dick Ingersoll requested that the subject of proxy flowgates be placed on the next ORS meeting agenda. He stated that if RAs want to use proxy flowgates then a proposal should be developed that describes how they are to be used. Without such a proposal, Mr. Ingersoll indicated that the use of proxy flowgates should not be allowed. Mr. Ingersoll moved that the RAs not use proxy flowgates until the ORS has a proposal on how to review and approve proxy flowgates. Roger Harszy moved to amend the motion that proxy flowgates be allowed until the ORS reviews the issue at its next meeting. The amendment to the motion was approved. It was noted that the amendment to the motion effectively allows the use of proxy flowgates until the next meeting of the ORS. If there is no proposal agreed to at that meeting, then the use of proxy flowgates would no longer be allowed. The motion as amended was approved.

From the February 2002 ORS minutes — Steve Corbin described the use of Proxy Flowgates for congestion management. Mr. Corbin defined a Proxy Flowgate and illustrated their use (Exhibit I). A concern was raised that perhaps Proxy Flowgates are being used to circumvent TLR policy and procedure. Dick Ingersoll stated that the use of Proxy Flowgates should be stopped until a procedure for their use is developed. Implementation of variable curtailment thresholds would help minimize the need for Proxy Flowgates.

Mr. Ingersoll moved to modify TLR procedure to include Proxy Flowgates and have the revised procedure approved through due process. Dave Zwergel moved to amend the motion to develop a practice of using PTDF flowgates in a proxy manner and that until these practices are formalized RAs could utilize Proxy Flowgates as they do today. Chair Fidrych noted that the motion as amended provides no incentive to quickly develop a procedure regarding Proxy Flowgate usage. The amendment to the motion was approved by unanimous consent and the motion, as amended, was approved. The amended motion is as follows:

> Moved to modify TLR procedure to include the practice of using PTDF flowgates in a proxy manner and have the revised procedure approved through due process.

The minutes of the December 12–13, 2001 meeting of the Subcommittee state the following:

> "It was noted that the amendment to the motion effectively allows the use of proxy flowgates until the next meeting of the ORS. If there is no proposal agreed to at that meeting, then the use of proxy flowgates would no longer be allowed."

The Subcommittee agreed that Proxy Flowgates could continue to be used while TLR Procedure is being revised to address use of Proxy Flowgates. Don Benjamin indicated that an urgent action Standards Authorization Request should be developed to address the TLR policy and procedure revision. Chair Fidrych appointed a task force (Lanny Nickell, Dan Boezio, Steve Corbin, Greg Stone, Dick Ingersoll, Vann Prater and Dave Zwergel, as chair) to address TLR policy and procedure revisions required to address use of Proxy Flowgates.

From the December 2002 ORS minutes — Dave Zwergel presented an overview of task force efforts to develop criteria for the implementation and use of proxy flowgates, including the associated identification and resolution of policy issues (Presentation 4). The Subcommittee noted the following concerns:

1. Need to address the root cause of over subscription of the transmission system, i.e. ATC/AFC calculation and coordination.

2. Use of proxy flowgates effectively reduces the curtailment threshold, and the existing IDC granularity does not support such a reduction in curtailment threshold.

3. Use of TLR Level 5 on a proxy flowgate can be a very complex process.

4. Perhaps the recommendations of the task force could be implemented in conjunction with the declaration of an Energy Emergency Alert or other similar Control Area declaration.

Mr. Zwergel noted that the task force developed three potential solutions related to the use of proxy flowgates. Those solutions are:

Solution 1 — Adjust impact threshold percentage on all buckets based upon the voltage of the monitored element of the flowgate (e.g. a 765 KV monitored element would result in a curtailment threshold of 6%).

Solution 2 — Adjust threshold impact percentage to 3% on all marginal buckets, regardless of voltage.

Solution 3 — Allow three standard forms of flowgates as follows:

- Single element PTDF
- Monitored element/contingent element OTDF
- Voltage or Dynamic Stability

Distribution Factor Working Group to propose criteria for justifying multi-element flowgates for approval by the ORS. DFWG would review all existing proxy or multi-element PTDF flowgates, and each such flowgate would be justified, converted to the standard form, or eliminated. Reliability Coordinators would continue to be allowed to build flowgates on the fly to address pending reliability concerns.

A staged approach to TLR curtailments would be implemented as follows:

- Curtail all non-firm transactions with 5% or greater impact, followed by
- Curtail all non-firm transactions with 3% or greater impact, followed by
- Curtail firm transactions and NNL with 5% or greater impact.

Lanny Nickell moved to adopt the task force recommendation to implement Solution 3. The Subcommittee expressed several reservations regarding the implementation of this proposal. The Subcommittee did not approve the motion, and Chairman Harszy asked the task force to work with the DFWG to refine its recommendation. In addition, Chairman Harszy asked the RCWG to discuss the task force proposal.

The task force made no progress in 2003 and 2004 due to market expansion of PJM and MISO and focuses on Version 0 Standards.

From the June 2005 RCWG minutes — Stuart Goza discussed the use of proxy flowgates to mitigate transmission congestion. He noted that the RCWG and the ORS have discussed this subject numerous times in the past few years; however, the minutes of February 2002 ORS meeting state:

> *"Moved to modify TLR procedure to include the practice of using PTDF flowgates in a proxy manner and have the revised procedure approved through due process."*
>
> The February 2002 ORS meeting minutes also state that the subcommittee agreed that proxy flowgates could continue to be used while the TLR Procedure is being revised to address the use of proxy flowgates.

Mr. Goza also stated that proxy flowgate is not a NERC-defined term, nor is its usage addressed in the Flowgate Administration Reference Document. *Mr. Goza moved that the setting of a system operating limit on a higher voltage flowgate, which may be the contingent flowgate, to protect the lower voltage system, and using the TLR process, is reasonable and allowable within the NERC reliability standards.* The following concerns were noted:

1. Limits on implementation may be needed, since many interchange transactions that impact the contingent element by less than 5% (the curtailment threshold) could be identified for curtailment when using the proxy flowgate.

2. Should this proposal be limited to single element PTDF flowgates?

3. What language in the current reliability standards prevents the use of proxy flowgates?

4. Metrics for the effective use of proxy flowgates should be developed.

Lanny Nickell moved to postpone the motion indefinitely. The RCWG approved the motion. Mr. Goza was asked to discuss this proposal further with the Distribution Factors Working Group.

Book of Flowgates II
The Next Generation Book of Flowgates
- November 3, 2005 -

The purpose of this document is to review the known problems with managing and using the NERC Book of Flowgates (BoF), examine the advantages of upgrading the BoF to an online database, and then identify the BoF upgrade options available to the NERC community. The conclusions of this document are supported by the members of the Distribution Factors Working Group (DFWG) and the Interchange Distribution Calculator Working Group (IDCWG). Both working groups have stated that the existing Book of Flowgates (BOF) should be upgraded from the existing format, an excel workbook, to an online database. In addition, this document also includes a proposal to not only upgrade, but also expand the BoF into a tool for coordinating flowgate information throughout the Eastern Interconnection.

The Existing Book of Flowgates

The BoF has been maintained within a Microsoft Excel workbook, since it was first created. In 1999, the BoF contained only 730 flowgates and 9 tables. On October 1, 2005, the BoF contained approximately 1505 flowgates and 13 tables. The number of flowgates has increased due to an improved understanding of the NERC TLR process and real-time increases in transmission congestion within the Eastern Interconnection, while the number of BoF tables has increased due to additional functionality required by changes within the industry (e.g., the addition of marginal zones and phase shifter data). The changes in the number of flowgates and functionality have highlighted many of the problems currently faced by the users and managers of the BoF.

Management
The DFWG is charged to manage the existing BoF and all future changes to the BoF necessary to support the various congestion management tools that are used throughout the Eastern Interconnection. With DFWG oversight, the base case model and BoF are physically maintained through a NERC established contract with IESO. The process used by the IESO representative, and ultimately the DFWG, to manage the BoF is described in the following paragraphs. A diagram of the overall process used to manage the BoF each month is shown in Figure 1.

1. A representative of IESO collects proposed changes to the base case model and BoF via a series of emails that are sent between the reliability coordinators and the IESO representative each month.
2. The IESO representative incorporates the proposed changes into the base case model, and performs a model validation to ensure that the model can be solved. Errors in the proposed changes to the model are emailed between the reliability coordinator and IESO representative until they are resolved.
3. Once the new model has been established, the IESO representative validates the proposed changes to the BoF against the model. Again, a series of emails is used to communicate and resolve any errors in the new flowgates.
4. The BoF and base case model are forwarded to OATI for validation and incorporation into the IDC. Finally, the model is forwarded to MCG for loading into the SDX.

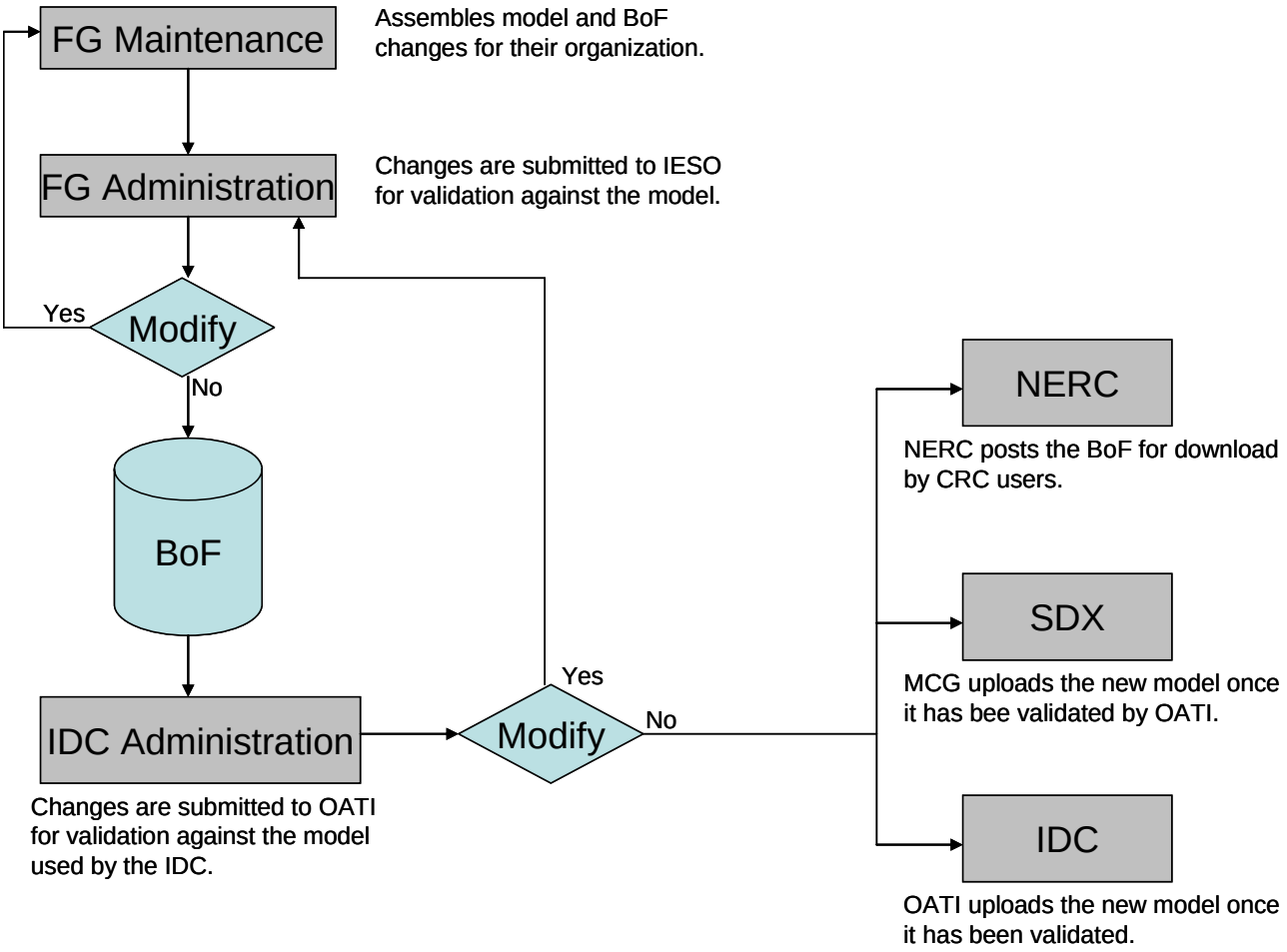

Figure 1: Generalized process for managing the existing Book of Flowgates.

Functionality and Structure
The 13 tables contained within the BoF are listed below:

- Flowgates
- LODFs
- MRD FGs
- Glossary
- FG Nos.
- Marginal Zones
- Map CA-TIS
- Map CA-SC
- Map CA-TP
- FG Change Log
- Phase Shifter
- PS Impedance Multiplier
- SC-CA-TP Mapping Change Log

The data contained within each of the tables is managed through several different manual processes. The Flowgates, LODFs, Phase Shifter, and PS Impedance Multiplier tables are assembled from information provided by the reliability coordinators to the IESO representative each month. The Marginal Zones, Map CA-TIS, Map CA-SC, and Map CA-TP tables are manually copied from the NERC TSIN registry. The FG Change Log and SC-CA-TP Mapping Change Log are manually updated by the IESO representative whenever a change to the BoF data is made. Finally, the FG Numbers and Glossary tables were incorporated to serve as a guide for users of the BoF. Note that the MRD FGs table has not been used in several years. It cannot be easily removed, due to a possible negative impact on the IDC.

Although the BoF was originally designed for use with the IDC, the number of BoF users and the number of uses has grown substantially since 1999. For instance, reliability coordinators and balancing authorities use the BoF data for operational planning, SOL/IROL associated flow reduction, and long-term studies, while energy marketers use the BoF data to map out possible congestion points. Many of these entities have been forced to develop custom applications to import and manipulate the BoF, due to the limitations of the MS Excel workbook.

Existing Problems and Limitations of the Existing BoF
Several problems and limitations to the existing BoF have been identified. A list of the most significant problems is provided below:

Limitations of Workbooks — Unlike a database where the information in each table can be linked together, changes to the spreadsheets in a workbook need to be made individually. This leads to a significant amount of data duplication, such as the contingent and monitored elements, which must be listed for each flowgate reference on each spreadsheet. Therefore, opening a workbook can lead to unnecessary and time consuming opportunities for human error.

Impact on the IDC — Each change made to the BoF structure forces a change to the IDC. Therefore, the addition or removal of tables is very rare. For instance, the MRD FGs table

cannot be easily removed without a change to the IDC, even though it has not been used in several years. Note that this problem cannot be easily resolved, unless the replacement to the BoF was incorporated into the IDC, which is not addressed within this document.

Lack of Security — The information contained within the BoF is openly communicated via unsecured email, and is neither encrypted or password protected.

Lack of Centralization — The distributed process that is currently used to maintain the BoF and Eastern Interconnect model is overly time consuming and that places data integrity at risk. Modern systems of this size and importance are maintained within a centrally located database.

Lack of Error Checking — The BoF is maintained through a manual process that is open to human error. I.e. no automated processes are available to ensure data submissions are correctly formatted or can be solved within the Eastern Interconnect model. Therefore, the process of making a single change to the BoF can take several days, while reliability coordinators, the IESO representative, and OATI communicate problems between each other.

Inability to Expand or create Customized Reports — Much of the Eastern interconnection has been forced to develop internal processes to expand the amount of data contained within the BoF and create customized reports. Several organizations within the NERC community (PJM, MISO, JISWG…) have requested that the data contained within the BoF be expanded and additional reports be added to the BoF.

The Proposed Next Generation Book of Flowgates

Members of the DFWG and IDCWG have stated that the BoF should be converted to an online relational database, due to the (previously mentioned) inherent limitations of the format of the existing BoF. An online database can resolve these problems by centralizing the data and change control process. The purpose of this section is to identify the proposed features and maintenance process relevant to the next generation BoF.

Features

All information currently available in the BoF will be provided in a relational database that can be accessed via a web user interface. A username and password will be provided to each NERC authorized user. Users will be divided into four different categories. These categories include:

1. Flowgate Maintenance User — The Flowgate Maintenance User will be able to create and modify flowgates and maintain the cross-reference relationships between Control Areas, Reliability Coordinators and Transmission Providers. The Flowgate Maintenance User will also be able to create and modify market zones, market coordinated flowgates, and phase shifter information within the BoF. All changes to the BoF made by a Flowgate Maintenance User will receive a "pending" status, until approved by the Flowgate Administrator. Each reliability coordinator within the Eastern Interconnect will be granted two Flowgate Maintenance User accounts.
2. Flowgate Administrator — The Flowgate Administrator will have all of the privileges of a Flowgate Maintenance User. In addition, the Flowgate Administrator will be given approval rights to accept all changes to the BoF as permanent. The IESO representative will continue to serve as the Flowgate Administrator, due to an existing NERC contract.
3. Flowgate Enduser — The Flowgate Enduser will only be able to download flowgate information and generate customized reports. The NERC Representative will not be able create or modify flowgate information. They will be limited to downloading flowgate information and generating customized reports. Flowgate Endusers may be any representative of an organization that is listed within the NERC TSIN registry.
4. NERC Representative — The NERC Representative will be the only user capable of assigning user privileges and approving or removing users. Note that the NERC Representative will not be able to create, modify, or approve changes to the model or BoF.

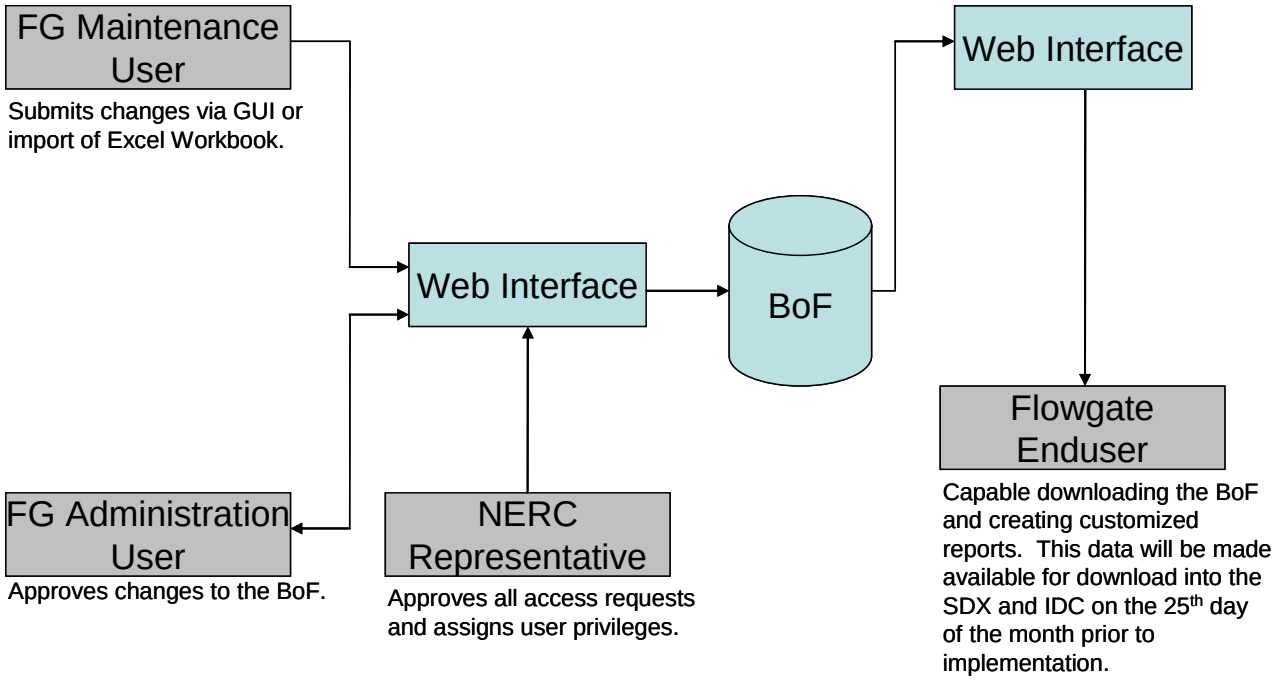

Figure 2: Interfaces of the next generation Book of Flowgates.

The next generation BoF will also incorporate the following features:

- Permanent flowgate numbers will be automatically assigned by the BoF for each new flowgate that is created.
- The next generation BoF will be able to automatically create .monitor files.
- The next generation BoF will be capable of importing and exporting the data to and from the existing format (i.e. An MS Excel Workbook) in order to ease the transition for the industry. This feature may also avoid cost increases to the IDC contract, by preventing OATI from having to change the IDC import process.
- Automated tools will be added to check for errors when flowgates or model changes are uploaded. The NERC registry will also be linked to the tool to provide additional data validation when loading model or BoF changes.
- Secure access will be controlled via individual password protected user accounts. In addition, the Flowgate Administrator will be required to possess a secure digital certificate.
- A series of customizable online reports will be available in the next generation BoF via the user interface, XML, or CSV formats.
- The creation of temporary flowgates will also be recorded within the next generation BoF.

Expanded Data Coordination Features

Several reliability coordinators have identified a need to exchange and coordinate flowgate limits, CBM, TRM, and other key items related to the coordination of AFC. PJM and MISO have already developed a mechanism for exchanging this information. However, PJM and MISO are currently limited to a CSV based file exchange process. Several other organizations (e.g. PJM, MISO, MAPP, TVA, and SPP) have already implemented or are planning to implement similar data exchanges of

this information. Centralizing this process is more efficient, and enables other organizations to use the information regardless of whether they are a signatory to a joint operating agreement. This information has significant value to the industry, and should be incorporated into to the next generation BoF, due to the principle of economies of scale. Note that this feature is considered to be optional due to the degree of added functionality to the BoF. A set of specifications for this functionality was developed by the NERC NAESB Joint Interchange Scheduling Working Group. This specification is provided in Appendix A.

Maintenance Process

The next generation BoF maintenance process will be modified to incorporate each of the new features. This process is briefly described below:

1. The designated representative of each reliability coordinator will log on to the BoF web interface as a Flowgate Maintenance User, and will submit their respective model and flowgate changes. The BoF will automatically check for formatting or known data problems, and instantly notify the user of any necessary changes. The status of the new information will be flagged as "pending" by the BoF.
2. The IESO representative will log on to the BoF as a Flowgate Administrator, and will verify that all "pending" data can be solved within the Eastern Interconnection model.
3. OATI will then login as a Flowgate Maintenance User to test the new BoF data against the IDC. The IESO representative will change the status from "pending" to "approved" once the data is validated by OATI.
4. Flowgate Endusers will be able to login and access the data on the 25th day of the month prior to implementation of the new BoF. The SDX and IDC vendors will be expected to download the BoF during this period.

   ***Note that in order to completely remove the dependency on the use of Excel workbooks, the IDC import process will need to be modified to accept a mutually agreed upon set of tables. The proposed table structure, cost, and development time necessary for a change to the IDC have not been discussed in this document. These items will be resolved by the IDCWG once a full specification has been developed.*

Available Options

The following options for rewriting the BoF are currently available to the NERC community. Note that each option can be further explored, if requested.

1. *BoF developed and hosted by NERC*
   The NERC staff has the internal capability to rewrite and host the BoF. However, the NERC IT department has recently moved to limit the number of tools that must be supported, due to a lack of available resources. Development by the NERC staff is likely to delay for several months, due to the existing commitments.
2. *BoF developed and hosted by a vender*
   Converting the BoF to an online tool is a relatively simple process for which a large number of capable venders exist, assuming that the specification is properly written. Cost, industry experience, and market position would be the primary factors to consider when choosing a vender.
3. *BoF incorporated into the development of a replacement to the NERC registry*

The NERC - NAESB Joint Interchange Scheduling Working Group (JISWG) is currently developing a specification for a replacement to the existing NERC registry. This next generation registry is expected to be available sometime in late 2006. The relationship between the data contained in the NERC registry and BoF could be used to develop a joint project. Note that the primary advantage of a joint project is to reduce the amount of NERC administrative support required for the two projects. A joint project also provides additional centralization of the NERC tools. The specification developed by the JISWG is provided in Appendix A.

Implementation Timeline and Estimated Cost

The development of the next generation BoF is expected to cost no more than $20,000, with a development time of no more than 90 days. Note that this timeline and cost assume that flowgate limits, CBM, TRM, and other key items related to the coordination of AFC are not included in the next generation BoF.

If the addition of flowgate limits, CBM, TRM, and other key items related to the coordination of AFC are incorporated into the project, the cost and development timeline are expected to increase by roughly $15,000 and 30 days, respectively.

Tool Lifetime

The next generation BoF will be designed with an estimated lifetime of 3-5 years. If the BoF is to be developed by a vender, the contract period should match that of the existing IDC contract, due to the possibility of incorporating this feature into the IDC at a future date.

Appendix A — Specifications for additional Book of Flowgates functionality

The following specification was developed by the NERC – NAESB Joint Interchange Scheduling Working Group for incorporation into a new TSIN registry. This information is provided as an appendix, because it significantly surpasses the existing functionality of the existing NERC Book of Flowgates.

The registry should support the maintenance and dissemination of flowgate information. Such information can be used in congestion management, ATC/AFC coordination, and reliability analysis. At a high level, the registry should be capable of communicating the following information:

- Flowgate definitions (type of flowgate, constituent elements, etc…)
- Seasonal limits
- Seasonal Transmission Reliability Margins
- Seasonal Capacity Benefit Margins
- Reciprocal Coordination Information

Each of these sets of information is described in more detail in the subsections below.
Flowgates and their associated data must be managed in a coordinated fashion. As such, all the informational needs described below should also include general data management characteristics, such as the ability to bring a flowgate into service on a specific date, take a flowgate out of service on a specific date, and permanently removing a flowgate.
Note that this does not replace the entire NERC Book of Flowgates; some data will still need to be kept separately for the use of the IDC (e.g., IMO Phase Shifter information, Marginal Zone information).

Flowgate Definition

There are several key pieces of information that define a flowgate. Specifically, there are the flowgates' constituent elements, the manner in which they are combined, and the intrinsic information about each flowgate. The registry should support the definition of this information as described below. Note that "paths" as used in WECC may also be described using this mechanism by defining a single-element flowgate.

Elements

The various physical transmission facilities that comprise the interconnection are defined as *transmission elements.* An element can be defined by a "from" bus, a "to" bus, and a circuit number. The busses and circuit numbers are defined within the NERC MMWG Base Case model. It should be noted that one element can be a part of many flowgates.

Element Groupings

Flowgates are defined as one or more elements. Accordingly, the definition of a flowgate must specify which elements make up that flowgate, and what role the element plays for that flowgate (monitored or contingent element).

Other Characteristics

Beyond the purely physical characteristics of the flowgate definition, there are other items that describe a flowgate and should be considered for inclusion in the Registry. These include the

flowgate ID number, the flowgate type (OTDF or PTDF), and whether the flowgate should be used for Firm AFC Calculations, Non-Firm AFC Calculations, or both..
There is also a need to understand which Balancing Authorities the constituent elements are a part of; this can be accomplished by specifying the BAs explicitly as a part of the flowgate definition.

Flowgate Limits

When considering flowgates for AFC coordination, there is an inherent need to know the physical capability of the flowgate. As such, the registry must support the ability to specify seasonal (summer and winter) limits (in MWs) for each flowgate. Note that the definition of "season" may vary from area to area (i.e., summer may start June 1 in one area, but July 1 in another). As such, the start and stop for each season should be explicitly defined and represented in the registry.

Transmission Reliability Margins

When considering flowgates for AFC coordination, in addition to the limits, there is also a need to understand the amount of flowgate capacity the Transmission Owner withholds as part of the Transmission Reliability Margin to ensure safe operations. The registry must support the ability to specify long-term (A) and short-term (B) TRMs for each flowgate. TRMs may be specified as a MW value or a percentage of the limit.

Capacity Benefit Margins

When considering flowgates for AFC coordination, in addition to the limits and TRM there is a need to understand the amount of flowgate capacity the Transmission Owner withholds as part of the Capacity Benefit Margin to ensure safe operations. The registry must support the ability to specify seasonal (Spring, summer, Fall, and Winter) CBMs (in MWs) for each flowgate. Note that the definition of "season" may vary from area to area (i.e., summer may start June 1 in one area, but July 1 in another). As such, the start and stop for each season should be explicitly defined.

Overrides

In addition to the functions described above regarding limits and margins, the registry should support the ability of a Transmission Operator to specify temporary changes in limits and margins. This functionality will enable the communication and coordination of operational activities related to system capability, such as deratings.

Reciprocal Coordination Information

As a part of IDC Change Order 114, the Book of Flowgates today continues information to communicate whether the IDC should treat a flowgate as one that is under the "Congestion Management Process." To continue support for this, the registry should include information to indicate how various coordination efforts are related. Specifically, the registry should support a communication of:

- What entities participate in coordination efforts
- Which entity effectively "owns" the flowgate
- Which entity "manages" the flowgate
- Whether the entity supports reciprocal operations on the flowgate
- When the entity studied the flowgate

- What ID the entity uses for the flowgate in its internal systems (if different form the NERC ID)
- Whether the flowgate is used in ATC/AFC processes or not
- How much the of forward and reverse flows (by percentage)on the flowgate should be considered in the AFC process