

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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:	Karl Kohlrus	
Organization:	City Water, Light & Power - Springfield, IL	
Telephone:	217-321-1391	
E-mail:	karl.kohlrus@cwlp.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input checked="" type="checkbox"/> RFC	<input checked="" type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

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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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

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Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: Planning for more than N-1 in real-time is not feasible.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
 June version
 New version with NPCC's recommended changes

Comments: Standard FAC-010-1, R2.4 begins with, "Starting with all facilities in service," Although this has been standard industry practice for decades, if a violation occurs, all the entity has to do is find one facility on his system (transmission line, transformer or generator) which was of service in the model at the time of the violation. Since there are nearly always some facilities out of service (normally open switches, peaking units, etc.) you may want to consider rewording this to avoid a big loophole.

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Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	William J. Smith	
Organization:	Allegheny Power	
Telephone:	(724) 838-6552	
E-mail:		
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
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FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

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Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

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system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
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 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

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1. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: Yes, but only for feasible multiple contingencies. Identifying all stability-related multiple contingencies could result in unnecessary system additions where a derate could assure reliability.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: I agree with the proposed conforming changes to TOP-002 and TOP-004, however I'm not aware of changes necessary for COM-002, nor are there any identified in the revised implementation plan.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: These additions would require the Bulk Electric System to be operated in a highly conservative and restrictive manner.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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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:	John Sullivan	
Organization:	Ameren	
Telephone:	(314) 554-3833	
E-mail:	JSullivan@ameren.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
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<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: The SOL methodology may have application in long term planning, but it is not clear from the definition of SOL or the requirements of the standards what these applications are.

Definitions - A revised definition of a System Operating Limit needs to be included with the standard. The definition for System Operating Limit in the NERC glossary is too broad and needs to be clarified, particularly for the planning horizon. Similarly, the definition for an IROL (Interconnection Reliability Operating Limit) needs to be reconsidered. It is uncertain how an IROL would apply in the planning horizon.

It is not clear whether a System Operating Limit would be different from a local area limit. Local area limits may exist which would not impact the operation of the system as a whole.

Comments on specific items in standard FAC-010, Section A and Requirements Section 1:

R1.2: Facility Ratings presently exist for normal and emergency conditions. It is not clear which ratings would be applicable for System Operating Limits. In addition, in the definition for System Operating Limit, the Facility rating is listed as one of the four types of System Operating Limits, which include not only Facility Ratings, but Transient Stability Ratings, Voltage Stability Ratings, and System Voltage Limits. This is confusing. Also, Level of Non-Compliance items 2.1.1, 2.3.1, and 2.3.2 only refer to Facility Ratings. This also seems to be inconsistent.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: Comments regarding specific sections of draft standard FAC-010, Requirements Section 2:

R2.2: The terminology in requirements R2.2 and R2.3 should be consistent with requirement R2.1 with respect to the state of the system prior to application of contingency events.

R2.3.3: It is not clear why a requirement for preparation for the next contingency be included as a requirement in this standard, which deals with the planning horizon.

R2.4: This requirement appears to be a restatement of reliability standard TPL-003-0. This requirement only requires the consideration of one of the multiple contingencies identified in TPL-003. The questions are: Why only one? Which one? Unless there is a good reason to consider only one multiple contingency, this requirement appears to be superfluous. In addition, R2.4 as written is not limited to a 'stability-related' multiple contingency. If this is the intent, R2.4 should be specifically stated in that manner.

Additional comments regarding draft standard FAC-014-1:

R6: This requirement needs clarification. One possible interpretation is that this would include multiple contingencies which would result in a stability limit. The second interpretation is to provide a stability limit which may exist post-multiple contingency (that is, for the next (single) contingency subsequent to the system reaching steady-state after the multiple contingency). We believe that the intent is the first interpretation.

What if the stability limit is localized and does not impact a wide area?

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: We agree with the intent or direction of the drafting team. However, we believe that this intent is not clearly conveyed in the requirements, measurements, and compliance items of the draft standard.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: As stated above, there is still considerable confusion regarding development of a System Operating Limits methodology and its application in the planning horizon.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: No comments on this item from a long term planning perspective.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: We agree, assuming that the standard would be approved for implementation.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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- March version
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Comments: We would prefer either the March or June version, provided that our comments and concerns are adequately addressed.

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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:	Phil Park	
Organization:	BC Transmission Corp	
Telephone:	604 699 7340	
E-mail:	phil.park@bctc.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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*

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The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: I agree that the standard can be split, but I do not necessarily agree that this is required - see my comments under item 3 below.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: The modification is consistent. However, I am confused by the wording of the above clause - which requires the PA to identify stability related multiple contingencies. The Requirement addresses the system response, not PA process.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on

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stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: Regardless of the original intent of Table 1, it should be applied for all system operating limits. FAC-011 R3.3 should address both stability and thermal limits. I do not understand the explanation on page 5 above - Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages, or uncontrolled separation. - Entities should set limits and load shedding for Category C events based on operating conditions at the time. In this way the shedding would be right for the conditions. If thermal limits are protected by overcurrent protection, thermal limits also need to be considered in establishing operating limits. FAC-010 and -011 should have the same requirements and language regarding multiple contingency events.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

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- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Have not reviewed pending resolution of issues in FAC-010 and -011

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency? same as single contingency,
 No I do not agree with the recommendations.

Comments: I agree with A and C. B is probably also acceptable, but I am not clear why it is necessary.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: The June version is an improvement. I am concerned that with the cross referencing the requirements are not clear. A person reading this in a hurry may miss the point. Also, we may spend a great deal of time debating the meaning. I encourage the drafting team to simplify and clarify as much as possible. The NPCC recommended changes are fairly consistent with my comments, so I prefer this version, although the above comments regarding the June version also apply.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input checked="" type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input checked="" type="checkbox"/>	5 — Electric Generators
<input checked="" type="checkbox"/> SERC	<input checked="" type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

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

Group Name: Duke Energy Carolinas
Lead Contact: Tom Pruitt
Contact Organization: Duke Energy
Contact Segment: 1
Contact Telephone: 704-382-4676
Contact E-mail: tvpruitt@duke-energy.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Bob Pierce	Duke Energy	SERC	1

*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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

- 2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.**

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

- R1.** The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

- R2.4** Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- 3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.**

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: This standard is being finalized at a time when the Assess Transmission Future Needs SDT has been charged with revising/clarifying TPL-001 thru 003. The TPL's are the basis for the FAC 010, 011 and 014 standards. It appears that it would be prudent to allow the AFTNSDT complete their work or decouple the MOD and TPL standards.

This is especially true for FAC-010 which applies to the planning horizon. If TPL-001 and 002 are being properly administered in the planning horizon, then all potential SOL's identified should have a remediation plan that precludes them from being an SOL/IROL. Seems that FAC-010 is redundant to the TPL standards.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.

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- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: This standard is being finalized at a time when the Assess Transmission Future Needs SDT has been charged with revising/clarifying TPL-001 thru 003. The TPL's are the basis for the FAC 010, 011 and 014 standards. It appears that it would be prudent to allow the AFTNSDT complete their work or decouple the MOD and TPL standards.

This is especially true for FAC-010 which applies to the planning horizon. If TPL-001 and 002 are being properly administered in the planning horizon, then all potential SOL's identified should have a remediation plan that precludes them from being an SOL/IROL. Seems that FAC-010 is redundant to the TPL standards.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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

Group Name: SERC EC Planning Standards Subcommittee (PSS)

Lead Contact: Kham Vongkhamchanh

Contact Organization: Entergy Services, Inc.

Contact Segment: 1

Contact Telephone: (985) 902-2511

Contact E-mail: kvongkh@entergy.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Darrell Pace	Alabama Electric Cooperative	SERC	1
Bob McGarrah	Ameren	SERC	1
Brian Moss	Duke Energy Carolinas	SERC	1
Pat Huntley	SERC	SERC	2
Phil Kleckley	South Carolina Electric & Gas Co	SERC	3
Art Brown	SCPSA (Santee Cooper)	SERC	1
Bob Jones	Southern Company Services	SERC	1
Travis Sykes	TVA	SERC	1

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

*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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Please ensure that the SDT has made the proposed changes to the correct version of COM-002-1.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: These proposed changes go beyond a reasonable expectation or practice within the operating environment. Transmission Operators have historically operated the system to withstand the next limiting single contingency if it has been determined that the contingency may cause reliability constraints, and this practice has worked well. Adding a requirement to operate within stability limits determined by the Planning Authority is a reasonable step. However, adding all Category C contingencies is not reasonable.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: See attached WORD document for comments.

**SERC PSS Additional Comments on the proposed
Determine Facility Ratings Standards (FAC-010, 011, & 014)**

1. FAC-010, R2.3.3 - This requirement is not appropriate at this point. It is a Category C event and is therefore already included in R2.4.
2. FAC-010, R2.4 - This requirement has excess words which make it confusing. Suggest deleting the words "the system" so that it reads as follows:

“Starting with all facilities in service, the system’s response to one of the multiple Contingencies identified in Reliability Standard TPL-003,~~the system~~ shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.”
3. FAC-010, R2. Delete the word “each” from the following:

“The Planning Authority’s SOL Methodology shall ~~each~~ include a requirement that SOLs provide BES performance consistent with the following:”
4. FAC-010, R2.4 – In the first sentence delete the phrase “one of.”
5. FAC-010, R2.5 – Revise the first sentence to read: “In determining the system’s response to multiple Contingencies identified in Reliability Standard TPL-003,…”
6. FAC-010, R3.1 - This requirement says that the area of study must include at least the entire Reliability Coordinator Area. This should say the Planning Authority's Area rather than the RC's area. Change “Reliability Coordinator” to “Planning Authority” in two places.
7. FAC-010, paragraph 3.3.1 - This gives non-compliance if the SOL methodology did not include evaluation of system response. The methodology does not evaluate. Change the words to be requirement for evaluation.
8. FAC-010, paragraph 3.3.1 - The reference to R4.2 is in error. It should be R2.2.
9. FAC-010, paragraph 3.3.3 - The reference to R5 is in error. Perhaps it should be R3
10. FAC-014, R6 - This requirement is written as if there will always be stability limits. There may be systems for which there are no stability limits for Category

C events. Suggest changing R6 to be "The Planning Authority shall identify the subset of multiple contingencies from Reliability Standard TPL-003 which result in stability limits **if there are any**". Suggest changing R6.1 to be "**If any stability limits are found**, the Planning Authority shall provide this list....."

11. FAC-014, M3 - M3 needs to be changed along with the suggested R6 changes. M3 should be changed to "The Planning Authority shall have evidence **that if** it identified a list of multiple contingencies **that resulted in** stability limits, **it** provided the list and the limits to its Reliability Coordinators in accordance with Requirement 6."
12. FAC-014, item 2.4.2 - This item needs to be changed along with the suggested R6 and M3 changes. Item 2.4.2 should be changed to "No evidence the Planning Authority delivered a set of stability-related multiple contingencies and their associated limits, **when such stability limits were found**, to Reliability Coordinators in accordance with R6."

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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 - 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:	Ron Szymczak	
Organization:	Exelon	
Telephone:	630-437-2795	
E-mail:	ronald.szymczak@exeloncorp.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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*

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004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: The intent to identify stability-related multiple contingencies is consistent with the intent of TPL-003. However, the intent of TPL-003 is also to reinforce the transmission system if instability or cascading is identified for Category C contingencies. If the transmission reinforcement is completed before the identified problem period, there is no need to inform operations as the identified problem has been corrected. Clarification is needed as to under what conditions operations should be notified of a potential concern regarding a Category C contingency. If no stability problems are identified in planning studies based on the assumed conditions studied, one could interpret the standard as presently proposed to require additional scenarios in an effort to identify stability limits. This would go beyond the intent of the planning standard. Exelon does agree that if a stability limit is identified and the required reinforcement will not be complete in time, then planning needs to inform operations of the results of the planning analysis.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: Although this proposed change would ultimately enhance reliability, there are practical issues as to the availability of real-time analysis tools and study frequency that must be addressed first. The standard needs to provide some guidance as to the frequency (i.e. hourly, daily, weekly, monthly) of the stability studies to be performed in operations and how far into the future the analysis should extend. Finally, the standard needs to be clear as to what type (i.e. voltage, angular or all) of stability studies are being required to be studied in the operations horizon.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: As stated earlier in this comment form, Table I was developed to determine if the BES system needs expansion for future conditions. Studying multiple contingencies in the operating time frame could only be practical if the appropriate real-time tools are available and studies can be performed in the time available (see comments from question 3). Until real-time tools, frequency of studies and time horizon to be studied are identified the linkage between operations and planning standards appears to be inappropriate.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.

No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Until the intent of this standard is clarified the corrections needed in the referenced standards cannot be determined.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments:

Please use this form to submit comments on the Balance Resources and Demand Drafting Team's fifth draft of the Balance Resources and Demand standards. Comments must be submitted by July 15, 2006. You must submit the completed form by e-mail to sarcomm@nerc.com with the words "Balance Standards" in the subject line. If you have questions, please contact Barbara Bogenrief at barbara.bogenrief@nerc.net or 609-452-8060.

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

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

Please read the BAL-007-1 through BAL-011-1 standards and then respond to the following questions. You do not need 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. Under the proposed BAL-008, when there is a Frequency Event, Reliability Coordinators must notify their Balancing Authorities at both the beginning and ending of that event.

With the Balancing Authorities' monitoring capabilities and situational awareness do you think it is necessary to require the Reliability Coordinators to make an official notification to the Balancing Authorities at the end of every Frequency Event?

- Yes, Reliability Coordinators should make notifications both at the beginning and the ending of each Frequency Event.
- No, Reliability Coordinators should only be required to make notifications at the beginning of each Frequency Event.

Comments: The notification ending the event may increase situational awareness among the BAs, but the notification should be at the discretion of the RCs and be based on severity and impacts (if any) of the excursion on the system. The RCs should be focused on ensuring that frequency has recovered and stabilized as opposed to an administrative reporting requirement with little benefit to reliability.

2. BAL-008 Requirement 3 requires each Reliability Coordinator to document all of its notifications and directives issued relative to operating within Interconnection Frequency limits. BAL-008 Requirement 4 requires each Reliability Coordinator to complete and submit a Frequency Violation Report when FTL or FAL violations occur.

Do you think that the Reliability Coordinator needs to document all of its notifications and directives issued relative to operating within Interconnection Frequency limits as required in BAL-008 Requirement 3 or do you believe that it is sufficient to only require that the Reliability Coordinator complete and submit a report when there is a Frequency Limit Violation?

- Yes, the Reliability Coordinator should document all notifications and directives and should complete the Frequency Limit Violation Report.
- No, the Reliability Coordinator should not be required to document all notifications and directives — completing the Frequency Limit Violation Report is sufficient.

Comments: Local RC logs and recorded phone lines are sufficient records and documentation. Our answer above should not imply that we agree with the FLV report. The DT needs to provide the justification / benefit for having multiple RCs within each Interconnection filling out an "Frequency Limit Violation Report". It is not clear to us what this report is trying to accomplish and who

will be reviewing them, for what purpose. At this time we would not support such a requirement on our RC.

3. The target research for the BRD standards was not conclusive on how to set FTL_{High} and FAL_{High} . For the field test, the high limits (BAL-011) were arbitrarily set symmetrically (to FTL_{Low} limits) above 60 Hertz. The SDT is not sure that FTL_{High} and FAL_{High} values are necessary for reliability of the interconnections given that turbine over-speed trip limits are set at a minimum of 61 Hertz. Frequency limitations appear more significant on the under-frequency side than the over-frequency side of 60 Hertz.

Do you think that the Interconnections need FTL and FAL frequency limits? (i.e. FTL_{high} ; FAL_{high}),

- Yes, Interconnections need both FTL_{High} and FAL_{High} .
 No, Interconnections do not need FTL_{High} and FAL_{High} .

If you think that the Interconnections need FTL_{High} and FAL_{High} , please cite the reasoning behind your recommendation and, if possible, provide a technical calculation that you recommend instead of the symmetrical FTL_{High} and FAL_{High} limits methodology that is currently included in BAL-011 and is used in the calculation of $BAAL_{High}$.

Comments: The absence of FTL high limits will send the wrong signal to the industry. Without adequate requirements, the system could be exposed to very high frequency periods during very lightly loaded system conditions. Without adequate requirements, entities may elect to allow economic benefits of avoiding unit cycling costs to dictate unit commitment strategies. Besides we like the symmetry.

4. Please identify any regional differences that should be included in any of the proposed standards.

- None
 Regional Difference:

5. The proposed effective dates identified in the Implementation Plan are based on actual experience gained during the field test. Do you agree with the effective dates proposed in the Implementation Plan? If not, please provide an explanation of what requirements you feel would need more time to implement.

- Yes, I agree with the proposed effective dates.
 No, I do not agree with the proposed effective dates.

Comments: The FRCC contains the highest underfrequency load shedding setpoints in the Interconnection. This, coupled with our peninsular geography makes us very sensitive to this proposed standard. We would need to retain some form of the DCS standard (BAL-002-0) in order to address unscheduled flow limitations and minimize reliability exposure after system disturbances (ie unit losses).

In general, we feel retention of the DCS standard upon implementation of this proposed standard would go a long way in addressing many of our "unscheduled flow" and reliability concerns with the proposed standard. This coupled with the fact that the field test actually included retention of DCS makes this transition much more appropriate and justifiable.

We would therefore like to see this reflected in the implementation plan and proposed effective dates.

6. Please provide any other comments you have on any of these standards or the implementation plan that you haven't already provided.

Comments: Once again, retention of DCS upon implementation would be more representative and consistent with the proposed standards field test results.

We would also favor some provision for suspension of compliance to these proposed standards. This provision should allow deviations from requirements during natural disasters (ie. hurricanes), system disturbances and islanding scenarios without incurring compliance violations.

7. If the BAL-007-1 through BAL-011-1 standards were balloted today, would you vote in favor of the standards or not? If not, please identify what needs to be addressed in the standards to maintain Interconnection Frequency within predefined frequency limits under all conditions.

Yes, I would vote in favor of the standards.

No, I would not vote in favor of the standards.

Comments: The FRCC would like to see retention of DCS upon implementation of the proposed standards. This retention would allow a better transition of the DCS standard in the future. In our opinion, the DCS standard has many other benefits other than impacts to frequency. The benefits include mitigating SOL and IROL violation and minimizing post contingency, system reliability exposures and unscheduled line flows. We would also like to see our other concerns identified above addressed prior to balloting.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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

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 - 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:	David Kiguel
Organization:	Hydro One Networks Inc.
Telephone:	416-345-5313
E-mail:	David.Kiguel@HydroOne.com
NERC Region	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/> 1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/> 2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/> 3 — Load-serving Entities
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Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: The standard to address SOL methodology should be one and the same, for usage in both the planning and operations horizons. The system should be operated according to how it is planned. While the SDT is correct in stating that the system is rarely in an operating condition with all elements in service, a restored state is a new starting point that is subject to the same contingencies considered in the planning studies with all elements in service. Considering only a subset of the contingencies at operations time compromises the reliability of the BES.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: See our comments on Question # 1.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

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The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
- No I do not agree with the revised effective dates in the implementation plan.

Comments: Most entities should have no problems with shorter times. These are methodologies that in most cases are already in place.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
- No I do not agree with the recommendations.

Comments: The NPCC proposal represents an acceptable compromise to resolve the issue of operation to withstand Category C contingencies.

The time permitted to prepare for the next Category C contingency should be the same 30 minutes as for the next single contingency, except in the case where preparing for the next Category C contingency would require load shedding, in which case, the time could be extended to 60 minutes.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: See our answer to question # 7. As comments to previous versions have indicated, NERC must strive to achieve consistency between planning and operating criteria to meet recognized reliability objectives.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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:	Ron Falsetti	
Organization:	IESO	
Telephone:	905-855-6187	
E-mail:	ron.falsetti@ieso.ca	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input checked="" type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

- 2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.**

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

- R1.** The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

- R2.4** Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- 3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.**

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies**.

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency**.
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
- No I don't agree with splitting FAC-010 into two standards.

Comments: The IESO strongly believes that the planning and operating standards for SOL determination should be the same such that the system is operated according to how it is planned despite the claimed starting point of all elements in service in the planning studies. From a system reliability standpoint, any steady state or restored state condition is a new starting point by itself, which can be subject to the same contingencies considered in planning studies for all elements in service. To consider less stringent contingencies when the system is not the same as it was studied is compromising reliability.

For many years now, IESO and its fellow member Areas in NPCC have developed SOLs and operated to respecting the same contingency requirements as in the planning horizon. Our basic regional requirements in both the planning and operating horizon are the same. Our operating experiences has shown that while it may be costly to observe the multiple contingencies in the operating time frame, the assurance that we know we are operating under a reliable domain in real-time is far superior to having to second guess whether or not we could withstand multiple contingencies if we were to only operate to the single contingency requirements. The tornado events that took down multiple transmission towers and the icing event that shut down an entire 500 kV switching station in rapid succession, both occurred in the mid 1980s, demonstrated that multiple contingencies could and did actually occur. IESO was fortunate to survive both events without uncontrolled cascade tripping of other parts of the system, and was able to contain the disturbance without affecting neighboring systems. Much of that can be attributed to the observance of multiple contingencies in operating horizon, and the operation staff's understanding and years of training and practices in establishing SOLs even under stressed situations.

That said, the IESO agrees that a split of FAC-010 into two standards and make provision for considering at least some multiple contingencies in developing SOLs in FAC-011 is a step in the right direction, with the eventual goal to achieve total consistency in SOL development between the planning and operating horizons.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

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Yes

No

Comments: (1) While this meets the intent of TPL-003, we suggest that R3.3 in FAC-011 be modified to allow the RC to determine other multiple contingencies not already identified by the PA as the need arises due to expected or prevailing system conditions (which the PA normally does not have prior knowledge).

(2) We again stress the importance to include the loss of any single bus or an inadvertent breaker opening that are stipulated in TOP-002 in this standard. These single contingencies can remove additional BES equipment or reconfigure the BES to the point where the BES could be in a cascading situation. While we agree the footnote indicates that the contingencies identified in R2.2.1 to R2.2.3 are the minimum set and are not the only ones that should be studied, lacking specificity it does not mandate the PA to study the two that are not listed. And this, in our view, is the kind of loose language that does not meet statutory requirements. We are unable to understand the continued exclusion of these contingencies given they are already specified in TOP-002 and FAC-010 now applies to the PA, who must also comply with the TOP-002 requirements. If the SDT strongly believes that these two contingencies are not required, we'd appreciate seeing the rationale.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

Yes the modifications made to the proposed standards are acceptable.

No the modifications made to the proposed standards are not acceptable.

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Comments: Please also see our response to Q2 for the added capability for RC to specify other multiple contingencies.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: Again, providing the RC the capability to determine other multiple contingencies for SOL development in the operating horizon would be a necessary supplement that further strengthens the linkage.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Further clarification on the term "stability-related" may be necessary in these standards such that it includes not only transient and dynamic stability, but also voltage stability that could shut down the system in seconds and/or in minutes.

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency? ASAP but no longer than 30 minutes. Note that this (and Tv fo SOL violation as claimed by some) is NOT intended as a grace period to allow the TOPs and any other operating entities to use and take advantage to achieve whatever objectives other than returning the system to a reliable state. This time period must be viewed as a constraint to "leave the premise" as opposed to the time that "one can wander into the premise" for other reasons.

That said, we feel that the proposed requirements need some flexibility. For example, if the system cannot be adjusted within 30 minutes to withstand the next Category C contingency without firm load shedding, the requirement may be relaxed to (not

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necessarily the exact wording) by adding "If firm load must be shed to met this requirement, then the system should be adjusted to withstand the next Category B contingency within 30 minutes, and to withstand the next Category C contingency within 90 minutes." to allow more time to adjust the system without shedding firm load. The 90 minutes (from inception of contingency) is recommended as it ties in with the BAL standard which requires the system to replenish its reserve in the same time period.

No I do not agree with the recommendations.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
 June version
 New version with NPCC's recommended changes

Comments: We strongly support a version that would include NPCC's recommended changes as that version would provide the assurance that operating within the SOLs and IROLs should protect the system from collapsing or cascade tripping if and when a C Category contingency occurs, which they do occur. However, we recognize that many in the industry may require some time to adjust to this approach; we would, from a pragmatic viewpoint, also support the June version as a first step toward achieving the NPCC recommended changes as our eventual goal. In either version, we would expect to see the additions suggested in our responses to Q2, Q3, Q4, Q5 and Q7, above, implemented.

Please note that in FAC-010, Footnote #3 makes references to R4.3.1 and R4.2, which appears inappropriate.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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.
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 - 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:	Kathleen Goodman	
Organization:	ISO New England	
Telephone:	(413) 535-4111	
E-mail:	kgoodman@iso-ne.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input checked="" type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

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Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: This is far too long to develop SOL methodologies and operate to the appropriate limits.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: Should this be adopted we would allow some flexibility beyond the 30 mins that NPCC RCs, such as ISO New England, operate to.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: Adoption of a version that includes NPCC's recommended changes would satisfy the concerns included in previous comments submitted to the drafting team on the March 2006 version, as well as on earlier FAC-010-1 drafts.

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Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Jim Cyrulewski	
Organization:	ITCTransmission	
Telephone:	248-374-7130	
E-mail:	jcyrulewski@itctransco.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
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FAC-011-1 — Establish and Communicate System Operating Limits

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FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

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004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

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R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

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system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
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 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

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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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: The separation does help to refine time horizon issues. However the separation does not address fundamental problem with proposed standards which is failure to state the need to use the Transmission Owners ratings as the ceiling for any SOLs or IROLs. Such a clarification is needed in Requirement 3 of both FAC-010 and -011.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?
- Yes
 No

Comments: The identification is done by the Transmission Owner. The Planning Authority honors what Transmission Owners have determined.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

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The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: Not restrictive enough. Transmission Owners provide limits for all contingencies and Planning Authorities and Reliability Coordinators honor such limits.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: Again the Transmission Owners ratings are the ceiling. Role of the Planning Authority should be clarified that it provided a list based on Transmission Owners ratings.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Not the Reliability Coordinators responsibility. Needs to be identified as Transmission Owner responsibility.

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: Not the Planning Authority or Reliability Coordinator responsibility. Do not need that much time to follow Transmission Owner limits.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: For single contingency should be As Soon as Possible but no longer than 30 minutes.

We also have a major problem with the definition of IROL Tv . Please consider the following explanation and redefinition:

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Need to redefine Interconnection Reliability Operating Limit Tv (IROL Tv)

Here are the current definitions of IROL and IROL Tv::

Interconnection Reliability Operating Limit (IROL): A System Operating Limit that, if violated, could lead to instability, uncontrolled separation, or Cascading Outages that adversely impact the reliability of the Bulk Electric System.

Interconnection Reliability Operating Limit Tv (IROL Tv): The maximum time that an Interconnection Reliability Operating Limit can be violated before the risk to the interconnection or other Reliability Coordinator Area(s) becomes greater than acceptable. Each Interconnection Reliability Operating Limit's Tv shall be less than or equal to 30 minutes.

Based on the definition of IROL, there is no room for violation. It says if the IROL is violated it could lead to system cascade. However, in IROL Tv, it says the IROL can be violated for up to 30 minutes. How can there be any time tolerance to a cascade limit? You may want to allow up to 30 minutes if the next contingency will cause IROL violation. It should only be on a "projected" basis, not an actual basis. Our suggested new definition would be:

Interconnection Reliability Operating Limit Tv (IROL Tv): IROL Tv is the maximum time allowed for system corrections to be made to reduce flows such that the next single contingency would result in an Interconnection Reliability Operating Limit violation. Each Interconnection Reliability Operating Limit's Tv shall be less than or equal to 30 minutes

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: Also changes cited in responses 1-7.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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:		
x		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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

Group Name: Midwest Reliability Organization (MRO)

Lead Contact: Tom Mielnik - MEC

Contact Organization: MRO - NERC Standards Review Subcommittee

Contact Segment: 2

Contact Telephone: 563-333-8129

Contact E-mail: tcmielnik@midamerican.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Terry Bilke	MISO	MRO	2
Al Boesch	NPPD	MRO	2
Robert Coish	MHEB	MRO	2
Dennis Florom	LES	MRO	2
Ken Goldsmith	ALT	MRO	2
Todd Gosnell	OPPD	MRO	2
Wayne Guttormson	SPC	MRO	2
Jim Maenner	WPSC	MRO	2
Darrick Moe, Chair	WAPA	MRO	2
Pam Oreschnick	XEL	MRO	2
Dave Rudolph	BEPC	MRO	2
Dick Pursley	GRE	MRO	2
Joe Knight, Secretary	MRO	MRO	2
27 Additional MRO Members	Companies not named above	MRO	2

*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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: The MRO believes the Drafting Team clarified the differences between the operating and planning horizons, as well as, the differences between the responsibilities of the Reliability Coordinator and the Planning Authority by splitting FAC-010 into two standards. However, the MRO notes that Version 3 of the NERC Functional Model and certain existing NERC standards (for example, TOP-002 and TOP-004), provide that the IROLs are determined by the Reliability Coordinator and the SOLs are to be determined by the Transmission Operator (not the Reliability Coordinator). These standards should be corrected to be consistent with Version 3 of the NERC Functional Model and other existing NERC standards.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: The MRO supports the approach proposed by the Drafting Team although we believe that R2.3.2. should be clarified and that the standard unnecessarily repeats wording from TPL-003-0.

R2.3.2 states that "System reconfiguration through automatic control or other preestablished methods." The MRO believes that the meaning of "other preestablished methods" would include manual control that has been preestablished through the development of an operating guide which provides a plan for manual action. The MRO believes it would be better to clarify this language particularly when compared to R2.3.3 of new FAC-11 which includes the wording "System reconfiguration through manual or automatic control or protection actions." To parallel the FAC-11 language and provide for the "preestablished" qualification, the MRO recommends that R2.3.2 in FAC-10 be revised to say, "System reconfiguration through manual control using preestablished methods, automatic control, or protection actions."

Draft FAC-010-1 unnecessarily repeats wording from TPL-003-0. For example, in R2.2, there is a recapitulation of the Category B events with R2.2.1, R2.2.2, and R2.2.3. The

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MRO believes that the Drafting Team should simplify the standard to refer to TPL-003-0 so that the standard is less complicated and easier to understand. Besides changes that would be required later to these standards due to changes to TPL-003 could be more easily incorporated.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

Yes the modifications made to the proposed standards are acceptable.

No the modifications made to the proposed standards are not acceptable.

Comments: The MRO supports most of the modifications with the exception of R3.3 in new FAC-11. The MRO does not think there are tools available that can properly test for stability issues in real-time. Further, it is impractical to use proxy flowgates to represent stability limits in real-time for all possible real-time conditions when the real-time conditions may vary greatly from the conditions that are used in the studies to develop the proxy flowgates, for example, the real-time conditions could involve many prior outages. The Transmission Operator and the Reliability Coordinator must still perform their functions to protect for the next contingency. Therefore, it is impractical to always provide for protection for multiple element stability limits in the real-time. Most of the MRO companies have conducted operational planning in the operating horizon to multiple contingencies "where practical", while they have not monitored continuously on a real-time basis except through proxy flowgates. Also, it may not be realistic to protect for multiple element contingencies when the system is already potentially in a state with a number of elements on outage. We recommend that the last sentence of the requirement be revised to add "where practical" as follows: "The process shall address where practical, recalculating these stability limits and expanding this list of stability limits and the list of stability-related multiple contingencies."

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4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: The MRO supports the linkage with the exception of the comments made in response to 2. and 3.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: The MRO does not support the revisions to R7 and R8 in TOP-002 that would require the Balancing Authority to take such stability-related multiple contingencies into account in determining capacity and energy reserve requirements. The MRO does not support the revision to R3.1 in BAL-002 that would require the Balancing Authority to take such stability-related multiple contingencies into account in determining first Contingency conditions. Typically operating reserves only protect for single element transmission contingencies. The requirements for multiple element outages may logically be included in planning reserve requirements but it is inappropriate to determine operating reserves on this basis. Otherwise, the MRO supports the conforming changes provided that it is qualified that the multiple contingencies are to be considered only "where practical". This has been the standard we believe historically has been followed by MRO companies and the industry in general.

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: The MRO believes that the effective dates give the most optimistic times for implementation of these significant changes. The MRO recommends that each of the three implementation time periods be doubled in length. In other words, the MRO recommends that the Planning Authority, the Reliability Coordinator, and then other entities be given 12 months, 6 months, and 6 months, respectively.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: The MRO does not support the NPCC recommendations because they are beyond the present level at which systems can be operated in the Midwest especially considering that multiple elements could well be out of service at the time that the Transmission Operator must prepare for the next contingency. For that very reason,

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we believe the MRO has operated in real time to a lesser requirement to protect for multiple element contingencies, where practical. It is not practical to protect for the next multiple contingency outage when a number of prior outages have already occurred on the system.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
 June version
 New version with NPCC's recommended changes

Comments: We do urge the Drafting Team to make the changes that the MRO has recommended before balloting these standards including revising the R2.3.2 of FAC-10 to clarify that manual actions that are preestablished are also acceptable system reconfiguration actions, adding "where practical" to R3.3 of FAC-11 and to other conforming changes in related NERC Standards, not making the conforming changes to the Balancing Authority requirements, doubling the implementation periods before balloting these standards, and eliminating the language repeated from the TPL standards.

General Comments:

FAC-010-1 On page 3 under Definition of Terms used in Standard, Capitalize Interconnection in the second sentence under definition of Interconnection Reliability Operating Limit Tv (IROL Tv).

At the bottom of page 5 after requirement R5 remove leftover symbol.

FAC-014-1 On page 6 under Levels of Non-Compliance, does it make sense to have no Level 1 but have levels 2-4? The MRO suggests changing this to levels 1-3.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input checked="" type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Group Comments (Complete this page if comments are from a group.)			
Group Name:	CP9, Reliability Standards Working Group		
Lead Contact:	Guy V. Zito		
Contact Organization:	NPCC		
Contact Segment:	2		
Contact Telephone:	212-840-1070		
Contact E-mail:	gzito@npcc.org		
Additional Member Name	Additional Member Organization	Region*	Segment*
Ralph Rufrano	New York Power Authority	NPCC	1
Kathleen Goodman	ISO-New England	NPCC	2
Al Adamson	NY State Reliability Council	NPCC	2
Greg Campoli	NY ISO	NPCC	2
Roger Champagne	TransEnergie	NPCC	1
David Kiguel	HydroOne	NPCC	1
Mike Gopinathan	Northeast Utilities	NPCC	1
Donald Nelson	MA Dept of Tele. and Energy	NPCC	9
Bill Shemley	ISO-New England	NPCC	2
Ron Falsetti	The IESO	NPCC	2
Guy V. Zito	NPCC	NPCC	2
Ed Thompson	ConEd	NPCC	1

*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 prior page.

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: This is far too long to develop SOL methodologies and operate to the appropriate limits.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: NPCC recognizes that an issue exists here and that should this be adopted we would allow some flexibility beyond the 30 mins that NPCC RCs operate to.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: Adoption of a version that includes NPCC's recommended changes would satisfy the concerns included in CP-9 comments that were submitted to the drafting team on the March 2006 version, as well as on earlier FAC-010-1 drafts.

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Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Alan Adamson	
Organization:	New York State Reliability Council	
Telephone:	(518) 355-1937	
E-mail:	aadamson@nycap.rr.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
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Background Information:

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FAC-011-1 — Establish and Communicate System Operating Limits

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1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

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FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: See our response to Question #8.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: See our response to Question #8.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: The New York State Reliability Council (NYSRC) submitted comments to the drafting team on numerous previous versions, including the version of FAC-010-1 and FAC-011-1 that was balloted in March 2006. A new version with the NPCC recommended changes is the only version that would adequately address the concerns included in these previous comments. The changes that would be acceptable to the NYSRC include NPCC's recommended revisions as stated in Question #7.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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

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 - 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:	John Mayhan	
Organization:	Omaha Public Power District	
Telephone:	(402) 552-5173	
E-mail:	jmayhan@oppd.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input checked="" type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

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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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: See comments in attached Word document.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: See comments in attached Word document.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: See comments in attached Word document.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: See our comments in response to Questions 2 and 3.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: See our comments in response to Questions 2 and 3. As stated in those comments, we believe that it is inappropriate to address only stability-related multiple contingencies rather than all multiple contingencies that could cause instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments:

Comments on Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Individual Commenter Information

Name: John Mayhan

Organization: Omaha Public Power District

Comments in response to Question 1:

Splitting FAC-010 into two standards is acceptable. We do have the following questions and comments, however:

1. Why do R2.3.2 of FAC-010 and R2.3.3 of FAC-011 have different wording? It seems that these two Requirements should have identical wording.
2. In R2.4 of FAC-010, did the drafting team intend to say "demonstrate transient, dynamic, and voltage stability" rather than "demonstrate dynamic and voltage stability"?
3. The following comments are grammatical in nature:
 - a. In R2 of FAC-010, strike the word "each".
 - b. R2.4 of FAC-010 does not make sense grammatically; one possible way of correcting this would be to insert the word "in" prior to the words "the system's response . . .".
 - c. Near the end of M3 of FAC-010, change "In accordance" to "in accordance".

Comments in response to Question 2:

TPL-003-0 requires that there not be cascading outages for multiple contingencies. Cascading outages could be caused not only by stability-related phenomena but also by steady-state phenomena (e.g., thermal overloads). Therefore, the phrase "stability-related multiple contingencies" does not fully account for the particular requirement of TPL-003-0 regarding cascading outages. Additionally, we believe that to be consistent with the intent of TPL-003, the requirements for consideration of Category C events, with the exception of C.3 events, should be identical between the planning and operating horizons. (See our comments in response to Question 3 for further discussion of this.) Because TPL-003-0 requires that thermal loadings and voltages be within Applicable Ratings following multiple contingencies, and because the drafting team's inserted language being discussed here does not mention Facility Ratings, the drafting team's inserted language may not be consistent with the intent of TPL-003 regarding Facility Ratings. (There are ambiguities in the definition of Applicable Rating; these ambiguities may be rectified with the Version 1 revisions to TPL-001, TPL-002, and TPL-003.)

We recommend not moving forward with balloting on FAC-010, FAC-011, and FAC-014 until the Version 1 revisions to TPL-001, TPL-002, and TPL-003 are far enough along to ensure that FAC-010-1, FAC-011-1, FAC-014-1, and the Version 1 revisions to TPL-001, TPL-002, and TPL-003 are consistent regarding multiple contingencies.

Comments in response to Question 3:

The requirements for consideration of Category C events, with the exception of C.3 events, should be identical between the planning and operating horizons. We do not agree with the reason provided by the drafting team for having different requirements for consideration of Category C events other than C.3 events between the planning and operating horizons. The drafting team's reason for the different requirements is that when a system is planned, the starting point is an intact system, while an intact system is rare in real-time operations. However, all of the Category C events with the exception of C.3 events are either common-mode or dependent multiple contingencies, and, as such, are completely unrelated to prior outages. Furthermore, while it may be true, strictly speaking, that an intact system is rare in real-time operations, most prior outages will have a negligible impact on a given SOL, and the system is effectively in an intact state the majority of the time in real-time operations as far as a given SOL is concerned. (C.3 events (Category B contingency, manual system adjustments, followed by another Category B contingency) do not need to be considered in the development of SOLs for the operating horizon because they consist of two independent contingencies; they essentially consist of a prior outage followed by another single-element contingency.)

The drafting team added requirements to require consideration of stability-related multiple contingencies and mentioned that these multiple contingencies could cause instability, cascading outages, or uncontrolled separation. However, cascading outages could be caused not only by stability-related phenomena but also by steady-state phenomena (e.g., thermal overloads). If the intent of the standard is to prevent cascading outages for multiple contingencies, then all multiple contingencies that could cause cascading outages, not just stability-related multiple contingencies, should be required to be considered.

Because it is essential that the requirements for determining SOLs be consistent with the requirements of TPL-001, TPL-002, TPL-003, we recommend not moving forward with balloting on FAC-010, FAC-011, and FAC-014 until the Version 1 revisions to TPL-001, TPL-002, and TPL-003 are far enough along to ensure that FAC-010-1, FAC-011-1, FAC-014-1, and the Version 1 revisions to TPL-001, TPL-002, and TPL-003 will all have identical requirements for consideration of common-mode and dependent multiple contingencies.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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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:	Richard Kafka
Organization:	Pepco Holdings, Inc
Telephone:	301-469-5274
E-mail:	rjkafka@pepcoholdings.com
NERC Region	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/> 1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/> 2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/> 3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/> 4 — Transmission-dependent Utilities
<input checked="" type="checkbox"/> RFC	<input type="checkbox"/> 5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/> 6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/> 7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/> 8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/> 9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies**.

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency**.
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: The latest versions of FAC-010- and FAC-011 do a lot to address these concerns.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments: Work needs to be done on TPL-003 to more properly address the more probable multiple contingencies.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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:	Verne Ingersoll	
Organization:	Progress Energy	
Telephone:	919-546-7534	
E-mail:	verne.ingersoll@pgnmail.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input checked="" type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
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Background Information:

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FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

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In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: Generally this standard makes no sense. SOL is an operating concept. There is no such thing in the planning area. Facility ratings and planning criteria are established and these are used to identify overload, stability or other problems and then upgrades to the system are developed to address those problems. If the point is to require the identification of line section limits using the facility ratings then this should be a simple addition to FAC-005 and require the info to be given to the TO who provides it to the RC. However I think this is not really needed as it is implicit in the process of doing transmission planning studies. There many other problems with FAC-10. Multiple contingencies are discussed in other questions. Requirement R3.1 assumes that the PA and RC cover the same footprint. This is only true for control areas that are also RCs. Control areas are typically the PA in the south and west. however, they often join together to sponsor a RC covering multiple control areas as was the intent of the original requirement for having an RC.FAC10 should be deleted for the reasons just stated.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: Again, TPL-003 is related to the planning environment. This does not translate to the operting environment. There are no existing tools for performing stability analysis in the operating arena. Once the system is built, stability is what it is. The system is built to withstand a certain type of fault as specified in the planning criteria and that is it.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments: See answer to #2.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: These studies are not done in the operations or operations planning horizon and the studies done in the planning horizon are for the purpose of determining necessary upgrades. To the extent they apply to planning they are already covered in TPL-004.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: The effect to require operations to multiple and stability contingencies which is not appropriate. The accepted level of operational reliability is to operate to the next contingency. There is no way to know how many contingencies will occur but operations must adjust after each one. There are not real time tools for operation to multiple contingencies. To impose the requirement would drastically reduce ATC. If there are areas of the country that have failed to plan and build a system that can withstand the requirements of TPL-004 then they should be found non-compliant with that standard.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: See response to #5.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
 June version
 New version with NPCC's recommended changes

Comments: FAC-11 and 14 continue to erroneously assign the responsibility for determining SOL to the RC when the functional model, industry practice and legal/regulatory requirements make this a responsibility of the Transmission Operator/Owner.

These proposed standards do not blend well with existing requirements. I find it difficult to understand and comment on these new standards from the planning perspective and how they integrate with many other approved standards and regional supplements that are closely related, such as:

TPL-001 to -004 : (Trans Planner/Planning Authority) System Performance under Normal, Single Element Loss, Two or more Elements, Extreme losses.
FAC-004 : (Trans Owner/Gen Owner) Methodologies for Determining Electrical Facility Ratings
FAC-005 : (Trans Owner/Gen Owner) Electric Facility Ratings for System Modeling
SERC supplements exist for each of these.

Is the intent of FAC-010 to make the Planning Authority's justify/document/confirm that the ratings they use are consistent with those provided by the Transmission Owner? Actually the TPL-001 to-004 standards in Table I, specifically indicates the PA is assessing scenario performance against "applicable ratings". Further note (a) in Table I states: "All Ratings must be established consistent with applicable NERC Reliability Standards addressing Facility Ratings." So there is already a link requiring ratings used by the PA to respect the ratings requirement standards for TOs.

How is an SOL relate to a Facility Rating?

FAC-004 requires the Transmission Owner to establish Methodologies for Determining Electrical Facility Ratings and that they are compliant with Regional Requirements. In R1.2 requires: "R1.2. The Rating of a facility shall not exceed the Rating(s) of the most Limiting Element(s) in the circuit, including terminal connections and associated equipment."

Existing FAC-005 requires the TO/GO to provide facility ratings that are consistent with their Methodology

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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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:	Neil Shockey	
Organization:	Southern California Edison	
Telephone:	626-302-4604	
E-mail:	neil.shockey@sce.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: SCE supports the comments submitted by the WECC Technical Studies Subcommittee.

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: SCE supports the comments submitted by the WECC Technical Studies Subcommittee.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

March version

June version

New version with NPCC's recommended changes

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input checked="" type="checkbox"/>	3 — Load-serving Entities
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Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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

Group Name: Southern Company Transmission
Lead Contact: Roman Carter
Contact Organization: Southern Co. Transmission
Contact Segment: 1
Contact Telephone: 205.257.6027
Contact E-mail: jrcafter@southernco.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Bob Jones	Southern Company Transmission	SERC	1
Keith Calhoun	Southern Company Transmission	SERC	1
Jim Busbin	Southern Company Transmission	SERC	1
Marc Butts	Southern Company Transmission	SERC	1
J.T. Wood	Southern Company Transmission	SERC	1
Raymond Vice	Southern Company Transmission	SERC	1
	Southern Company Transmission		

*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 prior page.

Background Information:

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FAC-011-1 — Establish and Communicate System Operating Limits

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FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

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004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

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2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

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R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

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Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: This change goes too far. Operators have historically operated the system to withstand the next single contingency, and this has worked well. Adding a requirement to operate within stability limits determined by the Planning Authority is a reasonable step.

Adding all Category C contingencies is not reasonable. If someone disagrees with the Reliability Coordinator's list of SOLs/IROLs and associated methodology, they can submit technical questions to the Reliability Coordinator and that Reliability

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Coordinator must respond. Again, adding all Category C contingencies is not reasonable. The described process just explained is an appropriate mechanism for parties to disagree and to address the concerns with their neighbor's methodology.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
 June version
 New version with NPCC's recommended changes

Comments:

Under FAC-011, R2.2, it states that following a single contingency all facilities shall be within their Facility Ratings and within their thermal, voltage, and stability limits. How does one interpret the use of post contingency operating guides? A literal interpretation might be that you can't have an N-1 result in loading above 100%. Is the assumption that we are within a short-term emergency rating post contingency, so that, technically we are within the Facility Rating? If so, would we be required to document these emergency ratings or just define a methodology? It is preferred to go with a methodology since the actual capability depends upon ambient conditions. Should the SDT include a post contingency operating guide?

Under FAC-014, R5, requires each to provide its SOLs and IROLs to those entities that have a reliability-related need for those limits. A clarification would be helpful where limits are case specific, meaning that a particular contingency/constraint pair may be a limit under one set of system conditions, but not under another.

Also

1. FAC-010, R2.3.3 - This requirement is not appropriate at this point. It is a Category C event and is therefore already included in R2.4.
2. FAC-010, R2.4 - This requirement has excess words which make it confusing. Suggest deleting the words "the system" so that it reads "the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003 shall demonstrate ..."
3. FAC-010, R3.1 - This requirement says that the area of study must include at least the entire Reliability Coordinator Area. This should say the Planning Authority's Area rather than the RC's area. Change Reliability Coordinator to Planning Authority in two places.
4. FAC-010, paragraph 3.3.1 - This gives non-compliance if the SOL methodology did not include evaluation of system response. The methodology does not evaluate. Change the words to be requirement for evaluation.
5. FAC-010, paragraph 3.3.1 - The reference to R4.2 is in error. It should be R2.2.
6. FAC-010, paragraph 3.3.3 - The reference to R5 is in error. Perhaps it should be R3
7. FAC-014, R6 - This requirement is written as if there will always be stability limits. There may be systems for which there are no stability limits for Category C events. Suggest changing R6 to be "The Planning Authority shall identify the subset of multiple contingencies from Reliability Standard TPL-003 which result in stability limits if there are any". Suggest changing R6.1 to be "If any stability limits are found, the Planning Authority shall provide this list...."
8. FAC-014, M3 - M3 needs to be changed along with the suggested R6 changes. M3 should be changed to "The Planning Authority shall have evidence that if it identified a list of multiple contingencies that resulted in stability limits, it provided the list and the limits to its Reliability Coordinators in accordance with Requirement 6."

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9. FAC-014, item 2.4.2 - This item needs to be changed along with the suggested R6 and M3 changes. Item 2.4.2 should be changed to "No evidence the Planning Authority delivered a set of stability-related multiple contingencies and their associated limits, which such stability limits were found, to Reliability Coordinators in accordance with R6."

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Please use this form to submit comments on the proposed Determine Facility Ratings standards. Comments must be submitted by **July 14, 2006**. You may submit the completed form by e-mail to sarcomm@nerc.com with the words "DFR-SOL" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or by telephone at 813-468-5998.

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:	Sara Meinert	
Organization:	Salt River Project	
Telephone:	602-236-3941	
E-mail:	scmeiner@srpnet.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

R3. Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

R1. The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

R2.4 Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

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 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments:

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments: As long as enough detail and explanation is provided by each Planning Authority for the Reliability Coordinator to appropriately analyze the impacts.

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments: Agree with most of them, but offer the following suggestions for revisions: (A.) TOP-002; R8. should be completed to read {...and any stability-related multiple contingency identified by the Reliability Coordinator.} (B.) TOP-004; R3. should be revised to read {...resulting from multiple outages identified by the Reliability Coordinator.} (C.) VAR-001; R7. revise the phrase {first Contingency} to be {single Contingency}. (D.) COM-002; R2.1. The word purchase should be removed. A Balancing Authority is not a Purchasing-Selling Entity. Rewrite the sentence to: The Balancing Authority is unable to have resources available to provide capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

(E.) COM-002; R2.2. The last sentence should read {...multiple Contingency identified by the Reliabilty Coordinator occurs, the Transmission Operator ...}

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments: I believe it should be longer to allow time for the study work to be completed, reviewed, coordinated, and implemented.

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency? another 30 minutes (or 60 minutes total from the contingency occurrence)
 No I do not agree with the recommendations.

Comments: Suggested revision to A.: change it to read {Following any of the Category C Contingencies identified.....}

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

- March version
- June version
- New version with NPCC's recommended changes

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

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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:	Ronald Belval	
Organization:	Tucson Electric Power Co.	
Telephone:	(520) 745-3269	
E-mail:	rbelval@tep.com	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information:

Two of the standards in the set of six Determine Facility Ratings standards failed to achieve a quorum when they were balloted:

FAC-010-1 — System Operating Limits Methodology

FAC-011-1 — Establish and Communicate System Operating Limits

While more than two thirds of the ballots that were submitted were affirmative, there were many comments indicating that the drafting team should modify the standards to require consideration of multiple contingencies in the determination of system operating limits. Rather than continue with a re-ballot, the drafting team revised the standards in attempt to improve consensus. A description of the major changes made to the standards after the initial ballot follows. The drafting team asks that you review the revised standards (<http://www.nerc.com/~filez/standards/Determine-Facility-Ratings.html>) and consider the drafting teams modifications to assist you in completing this comment form.

1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

FAC-010, which had included the requirements for the Planning Authority to develop methodology for developing System Operating Limits used in the planning horizon **and** the requirements for the Reliability Coordinator to develop a methodology for developing System Operating Limits used in the operating horizon, has been subdivided into two separate standards. The proposed set of standards is now:

FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

There is a significant difference in the purpose of operations and planning standards. Planning standards are developed to identify where there is a need for system expansion; operating standards are developed to ensure reliable real-time operation of the BES.

In real-time operations, most entities operate to N-1 starting from the real-time condition of the system including forced and scheduled outages; they operate so that they can withstand the next largest single contingency. This requirement is stated various ways in standards TOP-002, TOP-

004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy.

When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

- 2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.**

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

- R1.** The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

- R2.4** Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- 3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.**

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments: The two standards however must be consistent to ensure that systems are planned and developed such that they may be operated in accordance with the operating standards.

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: TEP agrees with the WECC Technical Studies Subcommittee comment as follows: "FAC-010 requires that the Planning Authority determine the SOL such that "the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur". Requiring that all Facilities to be within their "thermal limits" is beyond the stated requirement in the question to identify "stability-related multiple contingencies"."

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
 No the modifications made to the proposed standards are not acceptable.

Comments: Note that "future" revisions may be necessary depending actual experience.

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
 No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
 No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
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Comments:

Comment Form for Revisions to FAC-010 and FAC-011 following March 2006 Ballot

8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

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Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
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Background Information:

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FAC-011-1 — Establish and Communicate System Operating Limits

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1. The drafting team changed the titles and numbers of the standards to separate the requirements for developing an SOL methodology for use in the planning horizon from the SOL methodology for use in the operations horizon.

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FAC-010-1 — System Operating Limits Methodology for the Planning Horizon

FAC-011-1 — System Operating Limits Methodology for the Operations Horizon

FAC-014-1 — Establish and Communicate System Operating Limits (originally FAC-011-1)

The drafting team made these changes because many commenters seemed confused by the differences in the approach to SOLs used in the planning and operating horizons. There were several commenters who indicated that the standards should require consideration of **all** multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements.

The proposed standards need to coordinate with **both** operations standards that address real-time operations and planning standards that require analyses of the ability of the BES to operate under various theoretical states.

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004, VAR-001, BAL-002, and COM-002 (See Attachment 1). It is extremely rare in real-time operations to have an intact system. There is only one requirement in existing approved standards that requires operation to multiple contingencies, and this requirement in TOP-004 states:

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When the system is planned, the starting point is an intact system, with no facilities out of service and the analyses are used to determine where to make expansions. The planning standards TPL-001, TPL-002, and TPL-003 address the system under various operating conditions — with the system intact, with single contingencies, and then with multiple contingencies.

- 2. The drafting team modified the requirements so that the SOL methodology developed by the Planning Authority is consistent with, but does not duplicate, the existing planning standard TPL-003.**

There were several commenters who indicated that the standards should require consideration of all multiple contingencies in the development of system operating limits and referenced the approved standard TPL-003 — System Performance Following Loss of Two or More BES Elements. Here is TPL-003 Requirement 1:

- R1.** The Planning Authority and Transmission Planner shall each demonstrate through a valid assessment that its portion of the interconnected transmission systems is planned such that the network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand Levels over the range of forecast system demands, under the contingency conditions as defined in Category C of Table I (attached). The controlled interruption of customer Demand, the planned removal of generators, or the Curtailment of firm (non-recallable reserved) power transfers may be necessary to meet this standard.

Here is the revised requirement in FAC-010:

- R2.4** Starting with all facilities in service, the system's response to one of the multiple Contingencies identified in Reliability Standard TPL-003, the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- 3. The drafting team added requirements to require consideration of stability-related multiple contingencies. These multiple contingencies could cause instability, cascading outages, or uncontrolled separation.**

The revised standards require the Planning Authority's SOL methodology (FAC-010 Requirement 2.4) to address the multiple contingencies identified in TPL-003. The revised standards also require the Planning Authority (FAC-014 Requirement 6) to identify stability-related multiple contingencies and provide the Reliability Coordinator with a list of those contingencies and their associated stability limits. The revised standards require the Reliability Coordinator's SOL methodology (FAC-011 Requirement 3.3) to include a process for determining which of the stability limits are applicable for real-time use given the real-time

system conditions — and requires a process to recalculate these stability limits and expand the list of stability-related multiple contingencies and limits.

In the state where the operating condition is ‘all facilities in service’ then the real-time operating state would be consistent with TPL-003 for stability limits. For most large systems, there is rarely a time in a year when this state exists. Therefore, strictly operating to Category C could cause entities to operate in an overly restrictive state, perhaps leading to load shedding in anticipation of a Category C event. For this reason, the drafting team limited the inclusion of multiple contingencies to those that could cause instability, cascading outages or uncontrolled separation.

Note that NPCC has asked that FAC-010 and TOP-004 be further modified to require operation to withstand all multiple contingencies. The drafting team encouraged NPCC to draft the proposed changes and these changes are included for stakeholder consideration under question 7 of this comment form.

- 4. The modifications made to the SOL methodology developed by the Reliability Coordinator require modifications to existing operating standards that reference operating to a single contingency. The drafting team believes that some, but not all of these standards need to be modified as shown below:**

Note that there is only one approved operating standard that requires consideration of specified multiple contingencies — and this requirement in TOP-004 is limited to contingencies that have been identified by the associated Regional Reliability Organization. All other approved operating standards require operating so as to withstand any single contingency. Here are the requirements from these operating standards:

TOP-002:

- R6.** Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.
- R7.** Each Balancing Authority shall plan to meet capacity and energy reserve requirements, including the deliverability/capability for **any single Contingency and any stability-related multiple contingency identified by the Reliability Coordinator.**
- R8.** Each Balancing Authority shall plan to meet voltage and/or reactive limits, including the deliverability/capability for **any single contingency and any stability-related multiple**

TOP-004:

Purpose: To ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single Contingency** and **specified multiple Contingencies.**

- R2.** Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the **most severe single contingency.**
- R3.** Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from **multiple outages, as specified by Regional Reliability Organization policy** **the Reliability Coordinator.**

VAR-001:

- R2.** Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.
- R7.** Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.
- R7.1.** Each Transmission Operator shall disperse and locate the reactive resources so that the resources can be applied effectively and quickly when Contingencies occur.

BAL-002:

- R3.1** As a minimum, the Balancing Authority or Reserve Sharing Group shall carry at least enough Contingency Reserve to cover the most severe single contingency. All Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies.

COM-002:

- R2.** Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator, and all other potentially affected Balancing Authorities and Transmission Operators through predetermined communication paths of any condition that could threaten the reliability of its area or when firm load shedding is anticipated. The following information shall be conveyed to others in the Interconnection via an Interconnection-wide telecommunications system:
 - R2.1.** The Balancing Authority is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - R2.2.** The Transmission Operator recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that could threaten the reliability of the Interconnection. (Once a single Contingency or any stability-related multiple Contingency identified by the Reliability Coordinator that occurs, the Transmission Operator must prepare for the next Contingency.)

The Determine Facility Ratings Standard Drafting Team would like to receive comments on the above changes made to the FAC-010 and FAC-011. Please send your comments on this form and e-mail to sarcomm@nerc.com with the subject "DFR-SOLs" by **July 14, 2006**.

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. The SAR for this set of standards indicated that there should be requirements for the development of SOLs for use in the planning and operating horizons. The drafting team subdivided the requirements for developing SOL methodologies into two standards to provide greater clarity in distinguishing between the responsibilities of the Planning Authority and Reliability Coordinator in assessing the capabilities of the system.

Do you agree with splitting FAC-010 into two standards — one to address the development of the SOL methodology for use in the planning horizon and one to address the development of the SOL methodology for use in the operations horizon?

- Yes I agree with splitting FAC-010 into two standards.
 No I don't agree with splitting FAC-010 into two standards.

Comments:

2. Do you believe the modification to FAC-010, which requires the Planning Authority to identify stability-related multiple contingencies, is consistent with the intent of TPL-003?

- Yes
 No

Comments: FAC-010 requires that the Planning Authority determine the SOL such that "the system shall demonstrate dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur". Requiring that all Facilities to be within their within their "thermal limits" is beyond the stated requirement in the question to identify "stability-related multiple contingencies".

3. Several stakeholders indicated that Category C contingencies should be applied to the real-time operation of the bulk electric system (BES), as well as to planning analyses conducted for system expansion.

Table I was not developed with the intent of being used for real-time operations. Table I was developed for use in determining if the BES needs expansion for future conditions.

The drafting team tried to address the recommendation that Category C contingencies be applied to the operation of the BES by making the following changes:

- Require the Planning Authority to identify the subset of Category C contingencies that are stability-related; develop system operating limits for these stability-related multiple contingencies; give the list of stability-related multiple contingencies and associated system operating limits to the Reliability Coordinator.
- Require the Reliability Coordinator to include a process in its SOL methodology to assess this list of stability-related multiple contingencies and associated limits based on real-time conditions.

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The drafting team believes that these modifications support the portion of the stakeholder recommendation that is applicable to this set of standards. Focusing on stability-related contingencies addresses those limits that can have catastrophic results — instability, cascading outages, or uncontrolled separation.

Are the above modifications (to address Category C contingencies) to the set of proposed standards acceptable? If you think the modifications are overly restrictive or aren't restrictive enough, please identify what you think needs to be modified.

- Yes the modifications made to the proposed standards are acceptable.
- No the modifications made to the proposed standards are not acceptable.

Comments:

4. Do you believe the modifications to link the requirements between the Planning Authority (requiring the Planning Authority in FAC-014 to provide a list of stability-related multiple contingencies and associated limits to the Reliability Coordinator) and the Reliability Coordinator (requiring the Reliability Coordinator in FAC-011 to include a process in its SOL methodology to address this list of stability-related multiple contingencies and associated limits based on real-time conditions) provide the appropriate linkage between operations and planning standards? If not, please explain in the comment area.

- Yes I think the modifications do provide the appropriate linkage between operations and planning standards.
- No I do not think the modifications provide the appropriate linkage between operations and planning standards.

Comments:

5. Adoption of the philosophy of operating to stability-related Category C multiple contingencies results in the need to modify the language in some approved Version 0 standards, including changes to TOP-002, TOP-004, and COM-002. Note that BAL-002 and TOP-007 include references to operating to a single contingency, but the drafting team does not believe that conforming changes are needed for these standards.

Do you agree with conforming changes to the Version 0 standards (TOP-002, TOP-004, COM-002) highlighted in the revised implementation plan? If you know of any other standards that should be modified to conform to the changes made for multiple contingencies, please identify them.

- Yes I agree with the proposed conforming changes to TOP-002, TOP-004, and COM-002.
- No I don't agree with the proposed changes to TOP-002, TOP-004, and COM-002.

Comments:

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6. The effective dates in the proposed standards and associated Implementation Plan were changed to reflect that time is needed for the PA to 'hand off' a set of contingencies and limits to the RC and the RC may need some time to review those documents before finalizing its SOL methodology. The implementation plan gives the PA 6 months after BOT adoption to become compliant, and gives the RC an additional 3 months to become compliant. The standard that requires entities to follow their SOL methodologies would then become effective 3 months beyond that — or 12 months from the BOT adoption date.

Do you agree with the revised effective dates in the implementation plan?

- Yes I agree with the revised effective dates in the implementation plan.
 No I do not agree with the revised effective dates in the implementation plan.

Comments:

7. NPCC proposes the following changes for FAC-011 and TOP-004. These changes require operation to all Category C Contingencies rather than to the stability-related subset of Category C Contingencies.

- A. Add the following sub-requirement to FAC-011 Requirement 2:

Following the Category C Contingencies identified in TPL-003 Table 1, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

- B. Modify FAC-011 Requirement R 2.3 as follows:

In determining the system's response to a single or Category C Contingency, the following shall be acceptable:

- C. Add the following requirement to TOP-004:

Following a Category C Contingency (TPL-003 Table 1), the Transmission Operator shall adjust the system, if necessary, to withstand the next single contingency within 30 minutes and the Transmission Operator shall prepare for the next Category C Contingency within XX minutes. (This time requirement, presumably longer than 30 minutes, needs to be defined by the industry.)

Do you agree with NPCC's three recommended changes?

- Yes I agree with the NPCC recommendations. If yes, please identify how long you believe system operators should have to reconfigure the system to prepare for the next Category C Contingency?
 No I do not agree with the recommendations.

Comments: NPCC's proposed requirements do not distinguish between contingencies that may result in interconnection-wide impacts and those that may not. In addition, after the system has already suffered a multiple contingency, the next overlapping single (Category B) or multiple contingency (Category C) is deemed an Extreme Contingency in the current NERC Reliability Standard TPL-004, for which corrective transmission plans are not required. Strict adherence to NPCC's proposed requirements in setting real-time operating limits to protect against overlapping loss of any facilities or any combination of facilities could result SOLs within local areas

that would be overly restrictive. Overly restrictive operating limits indiscriminately applied could force entities to shed load or unnecessarily reduce economic transfers in anticipation of the next contingency or multiple contingencies, which may not occur or may not have regional impacts even if they did occur, resulting in reduced customer service.

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8. Which version of the standards do you prefer — the version that was balloted in March or the version that is currently posted or a version that would include NPCC's recommended changes?

March version

June version

New version with NPCC's recommended changes

Comments: