

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Note — This form is to be used to comment on version 2 of the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard.

Comments will be accepted from December 1, 2003–January 21, 2004.

Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Organization MAAC
Industry Segment # 2
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative: Representative Phone: Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

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The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

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The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

X No

Comments - What is not clear (i.e. is not stated) is that for an outage that lasts for some time (24 hours?) the system must be readjusted to achieve pre-contingency conditions, as in 603(a)(3)(i). Section 603(a)(3)(iii)(f) only states that readjustment is permitted; something should be added to state it is required. Also, Section 603(a)(3)(iv) should be eliminated and a note added in 603(a)(3)(iii) to state that interruption of load is permitted for Subsequent Contingencies only. I think this is the only difference between (iii) and (iv).

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

X Yes

No

Comments – “Level C contingencies” are appropriate for the Planning Authority and Transmission Planner to examine. This is because the system studied by planners is the “ideal” system with almost everything in service, whereas the system as operated in real time almost always has some elements out already. Therefore the planned system can and should be subjected to more severe contingencies to test its robustness. The contingencies in 603(a)(3)(ii) could then be noted as applicable to all 4 entities (RA, TOP, PA and TP), and additional “Level C contingencies” could be specified as applicable to the PA and TP only.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

X No

Comments – The changes suggested in 1. and 2. above are not intended to be a Regional Difference, they should apply to everyone.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments – The team’s response was very good and complete. The team also did something logical in their response document by grouping the three questions related to each Section of the Standard. However, the team also renumbered the questions, so that original questions # 6, # 7, and # 8 from the comment form became a three part question # 6 in the response document, original questions # 9, # 10, and # 11 became a three part question # 7, etc. This was very confusing when searching for the response to a comment made to a particular original question. The numbering of questions should always be maintained to be that used in the original comment form.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

X Yes

No

Comments – The PA and TP should have a limited role in developing SOLs. The SOLs they may develop should be used mainly to determine the difference in SOLs that occurs when certain facilities are placed in service. Planning SOLs should not be compared directly (number for number) to current operational SOLs

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments- The following are “wordsmithing / typo” comments: no issues, but minor changes that should be made.

Section 601(d) – Interchange the order of (1) and (2), to be more logical to the “initial compliance” and “subsequent compliance” order.

Section 601(e)(1), Section 601(e)(2)(i), and Section 601(e)(3)(l) – Replace, in three places, the word “items” with “applicable equipment types”, since the reference is to equipment types in 601(a)(3).

Section 603(a)(3) – Replace “603(a)(3)(i)-603(a)(3)(iv)” with “603(a)(3)(i) through 603(a)(3)(iv)”, for clarity.

Section 603(a)(4)(v) – Replace “603.1.4.1.-1.4.4.” with “603(a)(3)(i) through 603(a)(3)(iv)”, to conform to the revised numbering system.

Section 603(d) – Interchange the order of (1) and (2), to be more logical to the “initial compliance” and “subsequent compliance” order.

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Section 605(a)(3)(v) – Replace “605(a)(3)(i)” with “605(a)(3)(i) through 605(a)(3)(iv)”, since the reference should be to all the preceding conditions.

Section 605(d) – Interchange the order of (1) and (2), to be more logical to the “initial compliance” and “subsequent compliance” order.

Section 605(e)(3)(iii) – Replace “equipment types” with “items”, since the reference is to items in 605(a)(3).

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Industry Segment #

Telephone

E-mail

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Name of Group: <i>SERC Planning Standards Subcommittee (PSS)</i>	Group Representative: <i>Bob Jones (SERC PSS Chairman)</i>	
	Representative Phone: (205) 257-6148	
	Representative Email: rajones@southernco.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Art Brown</i>	<i>South Carolina Public Service Authority</i>	<i>1</i>
<i>Byron Stewart</i>	<i>Tennessee Valley Authority</i>	<i>1</i>
<i>David Weekley</i>	<i>Municipal Electric Authority of Georgia</i>	<i>1</i>
<i>Brian Moss</i>	<i>Duke Power</i>	<i>1</i>
<i>Darrell Pace</i>	<i>Alabama Electric Cooperative</i>	<i>1</i>
<i>Bob Jones</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Kham Vongkhamchanh</i>	<i>Entergy</i>	<i>1</i>
<i>Pat Huntley</i>	<i>SERC</i>	<i>2</i>

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- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments: This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: The majority of the PSS feels that this should be a requirement for Planning Horizon SOLs. However, real-time and day-ahead SOLs need only consider the next N-1 contingencies.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

4. **The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments: In the drafting team’s response to comments on Draft-1 they stated on numerous occasions that “the NERC requirement is intended as a minimum and regions have the right to use more stringent requirements if they choose.” However, this **intent** is not stated anywhere in Standard 600. We feel strongly that this intent needs to be included in the document. The following should be added on page 1 of the standard to make it clear that it applies to the entire standard: ***“The level of performance specified is a minimum and more stringent criteria for individual transmission providers or regions are permissible.”***

Many of the Transmission Providers in SERC plan beyond N-1 criteria. The majority of the PSS feels that adherence to 603 as written without this wording will result in reduced reliability in SERC.

5. **Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

6. **Please enter any other comments you have regarding this standard in the space below.**

Comments:

1. Section 603 (a) (4) (v): References listed at end of sentence need to be updated to the new format.

2. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

3. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon.

4. Section 604 (d) (1): The Transmission Planner function should be included in the annual verification process of the Compliance Monitoring Process.

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Name	Alan Adamson
Organization (NYSRC)	New York State Reliability Council
Industry Segment # 2	
Telephone	518-355-1937
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The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: Standard 600, as presently proposed, removes "Level C contingencies" that now exist in present NERC criteria, and as a result, weakens existing NERC criteria and reduces reliability. For many years NPCC and New York State Power System reliability criteria have required the system to withstand contingencies involving the loss of more than one element – usually the loss of both circuits of a double-circuit tower line or a fault with a stuck breaker. A major limiting contingency for three Regions – NPCC, MAAC and ECAR – has been the loss of both poles of the bipolar DC line between Radisson, Quebec and Sandy Pond, Massachusetts. Standard 600, without covering "Level C contingencies", would permit this contingency. Not including such contingencies in the criteria would increase transfer capabilities (on paper); however, an increase in the number of cascading outages, system separations, and blackouts could assuredly be expected. We recognize that if NERC does not adopt "Level C contingencies" in Standard 600, NPCC and the New York State Reliability Council (NYSRC) could still maintain their more stringent criteria, i.e., Regional or sub-Regional Standards. However, even then, the reliability of the NPCC Region and the New York State Power System could be jeopardized by inter-Regional impacts caused by the adoption of weakened NERC criteria in other Regions. We also note that "Level D" assessment, evaluation of extreme contingencies, was also not included in Standard 600 or any other presently proposed NERC Standard. Although extreme contingency assessment is not normally used for the calculation of transfer limits, it is presently required by the existing NERC Planning Standards "to measure the robustness of electric systems and should be evaluated for risks and consequences" (quoted from NERC Planning Standards IA Introduction). This type of assessment is particularly needed in the aftermath of the August 14, 2003 Blackout. NERC should not weaken its present criteria by elimination of this very important system planning requirement.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments: The NYSRC has adopted Reliability Rules that are more stringent and more detailed than Standard 600. The NYSRC Reliability Rules are not inconsistent with or less stringent than the NERC Reliability Standards, and the NYSRC has elected not to propose that they be made part of the NERC Standards.

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments:

The NYSRC is opposed to monetary sanctions as the only option for dealing with noncompliance as applied in this and other proposed NERC Standards. Unfortunately, direct monetary sanctions invite “gaming the system”, and encourage “business” decisions based on potential profits or savings versus potential penalties. Instead of monetary sanctions, the NYSRC prefers that NERC have the authority to issue letters of increasing degrees of severity to communicate noncompliance of mandatory standards. The NYSRC and NPCC now rely on a more stringent and mandatory process than monetary sanctions to assure compliance with reliability standards. Compliance is now mandatory through the contractual agreements and tariffs that all participants need in order to conduct business. The use by the NYSRC and NPCC of letters to regulatory agencies and other oversight bodies for reporting noncompliance has demonstrated that letter sanctions are a more effective tool for ensuring adherence to standards. Such letters establish the basis for liability in the event of a subsequent criterion violation, and in the case of market participant noncompliance,

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threaten the violator’s ability to do business with or through an ISO or RTO. Moreover, letters that communicate noncompliance best allow focus on the “root cause” of a violation, as well as its reliability impact.

Therefore, the NYSRC recommends that this and other NERC Standards expressly provide that letter sanctions be used in addition to or instead of monetary sanctions under circumstances in which they would be an equally or more effective enforcement mechanism.

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SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
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- 6 - Brokers, Aggregators, and Marketers
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>SERC Planning Standards Subcommittee (PSS)</i>	Group Representative: <i>Bob Jones (SERC PSS Chairman)</i>	
	Representative Phone: (205) 257-6148	
	Representative Email: rajones@southernco.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Art Brown</i>	<i>South Carolina Public Service Authority</i>	<i>1</i>
<i>Byron Stewart</i>	<i>Tennessee Valley Authority</i>	<i>1</i>
<i>David Weekley</i>	<i>Municipal Electric Authority of Georgia</i>	<i>1</i>
<i>Brian Moss</i>	<i>Duke Power</i>	<i>1</i>
<i>Darrell Pace</i>	<i>Alabama Electric Cooperative</i>	<i>1</i>
<i>Bob Jones</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Kham Vongkhamchanh</i>	<i>Entergy</i>	<i>1</i>
<i>Pat Huntley</i>	<i>SERC</i>	<i>2</i>

Background Information:

Notes to Industry Commenters:

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What has changed from Version 1 to Version 2?

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

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- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i) - (iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

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In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603, 605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments: This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: The majority of the PSS feels that this should be a requirement for Planning Horizon SOLs. However, real-time and day-ahead SOLs need only consider the next N-1 contingencies.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments: In the drafting team’s response to comments on Draft-1 they stated on numerous occasions that “the NERC requirement is intended as a minimum and regions have the right to use more stringent requirements if they choose.” However, this **intent** is not stated anywhere in Standard 600. We feel strongly that this intent needs to be included in the document. The following should be added on page 1 of the standard to make it clear that it applies to the entire standard: ***“The level of performance specified is a minimum and more stringent criteria for individual transmission providers or regions are permissible.”***

Many of the Transmission Providers in SERC plan beyond N-1 criteria. The majority of the PSS feels that adherence to 603 as written without this wording will result in reduced reliability in SERC.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments:

1. Section 603 (a) (4) (v): References listed at end of sentence need to be updated to the new format.

2. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

3. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon.

4. Section 604 (d) (1): The Transmission Planner function should be included in the annual verification process of the Compliance Monitoring Process.

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If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name Neil Shockey
Organization Southern California Edison
Industry Segment # 5
Telephone 626-302-2669
E-mail neil.shockey@sce.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative:	
	Representative Phone:	
	Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

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Comments

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Yes

No

Comments

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

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Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments It appears certain definitions used in this standard are geared toward “normal operating conditions” and do not adequately address real time events, which can and do change equipment and facility ratings. For example, a generator RAS may be activated real time that impacts (lowers) a Facility Rating or Equipment Rating. If this is not the intent of this standard, it is recommended that the definition of Facility Rating be changed to read: “...comprising the facility under normal operating conditions.”

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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: Operating Reliability Working Group – Southwest Power Pool	Group Representative: Scott Moore Representative Phone: 614-716-6600 Representative Email: spmoore@aep.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Matt Bordelon</i>	<i>CLECO</i>	<i>1</i>
<i>Dan Boezio</i>	<i>AEP</i>	<i>1</i>
<i>Bob Cochran</i>	<i>SPS</i>	<i>1</i>
<i>Keith Comeaux</i>	<i>CLECO</i>	<i>1</i>
<i>Mike Gammon</i>	<i>KCP&L</i>	<i>1</i>
<i>Allen Klassen</i>	<i>Westar</i>	<i>1</i>
<i>Connie Osthermann</i>	<i>Westar</i>	<i>1</i>
<i>Robert Rhodes</i>	<i>SPP</i>	<i>2</i>

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- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603, 605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

The proposed standard is not clear that such limits are to be modified for long-term outages. We struggled with this question because we were not exactly sure of the definition of long-term. Also, in the given example, for the next contingency following the loss of the 345 kV transformer, we would be prohibited from utilizing load shedding to operate within the provided limits as indicated in 603(a)(3)(iii)(f). This is too restrictive. Load shedding should be allowed in this situation.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

However; credible, multiple contingencies such as bus faults, double-circuit tower outages, etc. should be examined to determine if system cascading, instability or uncontrolled separation could result as a consequence of such an occurrence.

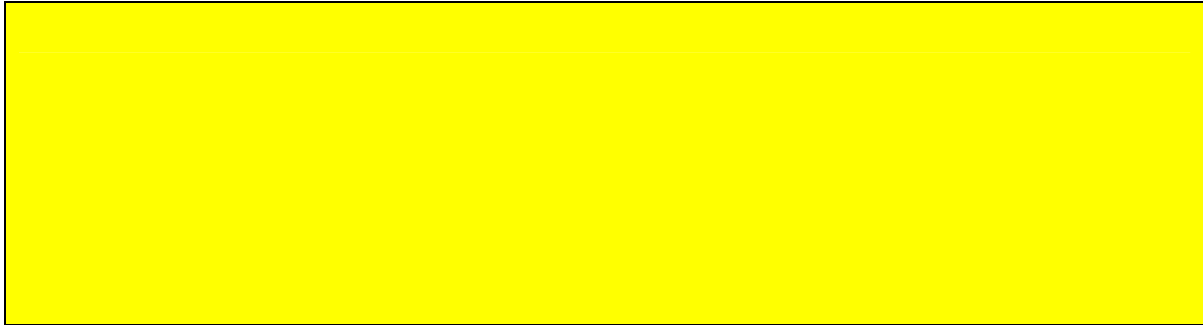
3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

But, we are not convinced that more restrictive regional differences should be incorporated into the standards. NERC standards are minimal criteria and regional differences for exceptions from the criteria are all that should be included, not additions to the criteria.



- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments

In our previous comments regarding sanctions for lack of methodology, we indicated that lacking a methodology or having an inaccurate methodology was just as serious an issue as not having an established rating. The SDT responded that this was a judgment call and that the majority of commenters had not concurred with our position. We still have concerns about this issue and would ask that the SDT reconsider its position. The SDT states that the lack of a methodology is not a reliability issue, but we believe it is. Maintaining a reliable system is contingent upon having accurate facility ratings. If the ratings are not accurate or are developed without a sound basis, then there is most definitely a reliability issue that needs to be addressed.

In their response to our previous comment on the requirement in 606(a)(1), the SDT indicated that the Planning Authority is responsible for long-term transfer capabilities and the Reliability Authority is responsible for real-time transfer capabilities. We concur with this conclusion. In order to prevent confusion we suggest the SDT incorporate this time horizon into 606(a)(1) and 605(a)(1) as the SDT did in 606(e)(2) and 606(e)(4).

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

One would be hard pressed to find a reason to justify responding negatively to this question.

6. Please enter any other comments you have regarding this standard in the space below.

Comments

In 601(e)(2)(i), what are the items referred to in 601(a)(3)?

In 602(e), what was the thought process involved in deciding that not being consistent with methodology was more critical than not having a specific rating? Similar situations also occur in 604(e) and 606(e).

The severity of the penalty for noncompliance should not be based upon whether the facility is an existing facility or a new facility as is stated in 602(e)(1) and 602(e)(2). The sanctions should be the same in either case since the consequences for exceeding these ratings would be the same.

Shouldn't curtailments of transfers be included in 603(3)(iii)(g) and 603(3)(iv)(g) since they are one of the most commonly used responses to overloads?

Shouldn't the reference in 603(4)(v) be 603(a)(4)(i)-(a)(4)(iv)?

The draft standard contains two-604(d)s. The last one should be 604(e).

The use of "some, but not all requested" terminology in a situation that is in fact "all are required" lessens the intent of the standard. The language used in the first draft was more direct. Why did the SDT change it?

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Industry Segment # 1 – Transmission Owner
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E-mail edavis@entergy.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
- 9 - Federal, State, and Provincial
Regulatory or other Govt. Entities

Comment Form — 2nd Posting of the draft 'Determine Facility Ratings, System Operating Limits, and Transfer Capabilities' Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative: Representative Phone: Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments:

We see several potential problems reflected in this first question.

First, we have the understanding that the base case load flow models used to estimate SOLs should reflect the power system and the expected in-service/out-of-service condition of all of the elements of the power system under examination. This base case load flow model reflection of the condition of the elements of the power system applies to all base case load flow models: planning, operations planning, operations, etc., not just longer-term planning models. All SOLs should be redetermined when those expected in-service/out-of-service conditions change in the planning, operations planning, operations, etc horizons. Therefore, we suggest an obvious statement be placed in the Standard to the effect that SOLs are redetermined whenever the power system elements in-service change from those contained in the base case load flow models when SOLs were determined.

Second, we have been unable to find any place in the Standard that would restrict load shedding and/or system reconfiguration requirements because an element is out-of-service. Therefore, in response to the posed question, it is not clear that the Standard does “reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection”.

Third, the Standard does permit system adjustments, interruption of load or system configuration in response to contingencies. We believe there should be no need to change the rules for load shedding and/or system reconfiguration under contingency conditions when SOLs are redetermined to reflect expected in-service conditions of the elements of the power system.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Comments

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments: The drafting team did develop responses to our comments and we agree with some of the responses and disagree with others.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

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SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

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- 8 - Small Electricity Users
- 9 - Federal, State, and Provincial Regulatory or other Govt. Entities

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>South Carolina Electric & Gas</i>		Group Representative: <i>Clay Young</i>
		Representative Phone: 803-217-9129
		Representative Email: <i>cyoung@scana.com</i>
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Clay Young</i>	SCE&G	3
<i>Lee Xanthakos</i>	SCE&G	1
<i>Gene Delk</i>	SCE&G	1
<i>Charles White</i>	SCE&G	1
<i>Al McMeekin</i>	SCE&G	1
<i>Peter Chow</i>	SCE&G	3
<i>Phil Kleckley</i>	SCE&G	3
<i>Johnny Martin</i>	SCE&G	3
<i>Gene Sault</i>	SCE&G	5

Background Information:

Notes to Industry Commenters:

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What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments This section needs clarification on the operating and planning horizons. It is not clear what time frame the standard is applicable to. Also, same comments as submitted by the SERC Planning Standards Subcommittee.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments SCE&G believes that a significant majority of the industry has used contingencies such as "Level C contingencies" in determining transmission performance in the past. Exclusion of these kinds of requirements will result in "decreased reliability" of the US transmission grid. SCE&G believes that these kinds of requirements should be retained in the NERC Standards. Also, same comments as submitted by the SERC Planning Standards Subcommittee.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments If these standards do not evolve to include "Level C" type contingencies, then SCE&G will ask SERC to review its recently retired "Planning Principles and Guides" to determine if they need to be revived. SERC recently retired these requirements because SERC determined that they were redundant to the NERC Planning Standards. They are not redundant to this reduced 603 standard. SERC will determine at that point if a SERC Regional Difference will be pursued. Also, same comments as submitted by the SERC Planning Standards Subcommittee.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments If these standards do not evolve to include "Level C" type contingencies, then these standards must include specific statements that Regions, sub-regions, and individual transmission providers may have more stringent standards to ensure that the current and expected level of transmission performance is continued. Also, same comments as submitted by the SERC Planning Standards Subcommittee.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments Same comments as submitted by the SERC Planning Standards Subcommittee.

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>Southern Co. Generation & Energy Marketing</i>		Group Representative: <i>Roman Carter</i> Representative Phone: 205.257.6027 Representative Email: <i>jrcarter@southernco.com</i>
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Roman Carter</i>	<i>SCGEM</i>	<i>5,6</i>
<i>Joel Dison</i>	<i>SCGEM</i>	<i>5,6</i>
<i>Tony Reed</i>	<i>SCGEM</i>	<i>5,6</i>
<i>Lucius Burris</i>	<i>SCGEM</i>	<i>5,6</i>
<i>Terry Crawley</i>	<i>SCGEM</i>	<i>5</i>
<i>Roger Green</i>	<i>SCGEM</i>	<i>5</i>

Background Information:

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- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
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Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
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General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments- This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

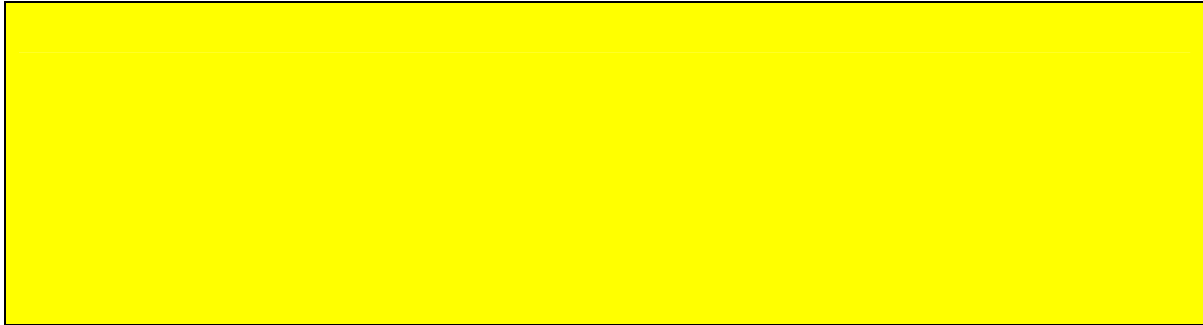
Comments – We answer both “yes” and “no” on this question. This should be a requirement for Planning Horizon System Operating Limits. However, real-time and day-ahead System Operating Limits need only the next N-1 contingencies.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments- We do not currently know of any Regional differences at this time. However, during the initial phasing in of standards, each region may find adopting or developing a different approach provides increased reliability. Therefore, we believe that differences should be considered as they are identified in the future.



4. **The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments – In the Drafting team’s response to comments on Draft 1, they stated on numerous occasions that “the NERC requirement is intended as a minimum and Regions have the right to use more stringent requirements if they choose.” However, this intent is not stated anywhere in Standard 600. We feel strongly that this intent needs to be included in the document. The following should be added on Page 1 of the Standard to make it clear that it applies to the entire standard: “***The level of performance specified is a minimum and more stringent criteria for individual transmission providers or Regions are permissible.***”

5. **Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments- From a Generating plant perspective, we heavily rely upon the Planning Authorities and Transmission Planners to identify appropriate system operating limits during the performance of studies related to **planned** changes in the transmission system. The addition of transmission equipment (such as capacitors or reactors), interconnection of new generation, replacement of generator excitation systems, addition of power system stabilizers, changes in voltage schedules, and other changes can have significant impacts on generators and the generator substation equipment. These changes can affect existing System Operating Limits and create the need for new ones that are not only important for the integrity and reliability of the transmission system, but for generator / transmission interconnections as well. Failure to address this during the **planning** process could result in loss or instability of several generators at a point on the grid and could have significant impact on the reliability of an area of the interconnected grid.

6. Please enter any other comments you have regarding this standard in the space below.

Comments –

1. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

2. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon.

3. This and all NERC Reliability Standards should be very clear in requiring a Company to provide Facility Ratings, Operating Limits, and other data for “Reliability-based” needs only. The schedule for requesting the data from the Company shall be reasonable for the scope and type of data requested.

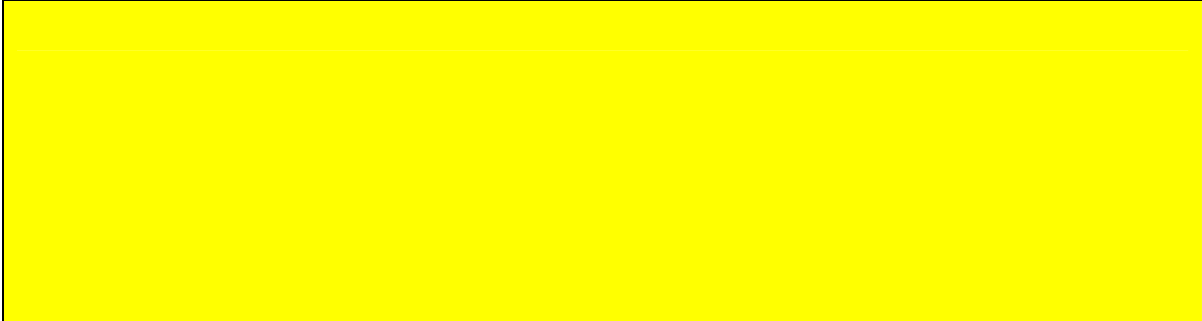
4. There may be some confusion between what constitutes a Facility rating versus an Operating limit in some cases. For example, the reactive capability or rating of a generator is typically considered to be the limit based on the machine D curve or capability curve. However, the generator bus voltage or auxiliary bus voltage may limit the reactive capability of a particular generator for certain system or operating conditions. Unless the reactive limit in VARs is a single value (which it usually is not), this is typically referred to as an operating limit. However, classifying such a limit as the reactive power “Facility rating” for the generator seems to be what this standard requires. We request clarification on this.

5. Standards approved using the Functional Model paradigm prior to the Functional Model being implemented should require some type of transitional language applying the Standard to a Control Area environment. Future changes to the Functional Model should also be fully coordinated and synchronized with the NERC Standards.

6. Section 604 (d) (1): Need to add Planning Authority and Transmission Planner in this monitoring process to be consistent with 604 (a) (2).

7. Section 603 (a) (4) (v) has wrong references. It should refer to sections located at 603 (a) (4) (i) through 603 (a) (4) (iv).

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)	
Name	Joe Willson
Organization	PJM Interconnection
Industry Segment #	2
Telephone	610-666-8820
E-mail	willsojd@pjm.com

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Name of Group:	Group Representative: Representative Phone: Representative Email:	
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For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments What is not clear (i.e. is not stated) is that for an outage that lasts for some time (24 hours?) the system must be readjusted to achieve pre-contingency conditions, as in 603(a)(3)(i). Section 603(a)(3)(iii)(f) only states that readjustment is permitted; something should be added to state it is required. Also, Section 603(a)(3)(iv) should be eliminated and a note added in 603(a)(3)(iii) to state that interruption of load is permitted for Subsequent Contingencies only.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments Yes but there must be a clear delineation about the time frame being reviewed and analyzed. The Planning arena and the real-time Operations expectations must be spelled out with specific measurements and non-compliance elements for each.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments NPCC's request is for more stringent requirements which a region can always implement. The NERC standards must be for all.

4.

5. **The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments

6. **Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

7. **Please enter any other comments you have regarding this standard in the space below.**

Comments

Problem with this Standard 600 has to do with the non-compliance elements. For example requirement 601 (e) Levels of Noncompliance, every level 1 and 2. " or does not address one of the items listed in 601 (a)(3) . However, when you read the requirement, it states the following: 601 (a) (3)

The methodology required is 601 (a)(1) shall identify the assumptions used to determine Facility Ratings Are determined and references to industry rating practices or other standards (e.g. IEEE, ANSI, CSA), when applied. It does state "including the method by which..." so what is being measured? The assumptions or specific methodology for devices? If the later it need to be more descriptive of "electric system equipment types"

For 602

The non-compliance levels are not measurable unless someone is collecting all the facility information (existing and new facilities) and then comparing it or asking the RA if they have revised ratings for these pieces of equipment. Levels one and two have "some but not all" without any way of determining what all is. Level 3 (methodology) doesn't belong here.

603

The compliance monitoring process doesn't even specify what the compliance monitor will be checking. Submit any information and you are compliant? Also problems with non-compliance levels The requirement is for a methodology but level 3 is based on performance to that methodology.

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Name of Group: <i>Southern Company Services, Inc</i>		Group Representative: Marc Butts Representative Phone: 205-257-4839 Representative Email: mmbutts@southernco.com
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Marc Butts</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Bob Jones</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Mike Miller</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Chuck Chakravarthi</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Mike Oatts</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Monroe Landrum</i>	<i>Southern Company Services</i>	<i>1</i>
<i>Gwen Frazier</i>	<i>Southern Company Services</i>	<i>1</i>

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The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments --This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments --We answer both "yes" and "no" on this question. This should be a requirement for Planning Horizon System Operating Limits. However, real-time and day-ahead System Operating Limits need only the next N-1 contingencies.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments --We do not currently know of any Regional differences at this time. However, during the initial phasing in of standards, each region may find adopting or developing a different approach provides increased reliability. Therefore, we believe that differences should be considered as they are identified in the future.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments --In the Drafting team’s response to comments on Draft 1, they stated on numerous occasions that “the NERC requirement is intended as a minimum and Regions have the right to use more stringent requirements if they choose.” However, this intent is not stated anywhere in Standard 600. We feel strongly that this intent needs to be included in the document. The following should be added on Page 1 of the Standard to make it clear that it applies to the entire standard: “***The level of performance specified is a minimum and more stringent criteria for individual transmission providers or Regions are permissible.***”

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments ---- Operating timeframe: Planning must be involved, particularly for stability analyses, given the state of current real-time analyses tools. Although the industry must work towards better online tools for stability analyses, currently most, if not all, entities rely on planning to perform stability studies.

Planning/study timeframe: Planners are necessary for developing SOLs for the study timeframe since SOLs are based not only the physical characteristics of equipment, but the status and configuration of the system.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments -

1. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

2. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon.

3. This and all NERC Reliability Standards should be very clear in requiring a Company to provide Facility Ratings, Operating Limits, and other data for “Reliability-based” needs only. The schedule for requesting the data from the Company shall be reasonable for the scope and type of data requested.

4. There may be some confusion between what constitutes a Facility rating versus an Operating limit in some cases. For example, the reactive capability or rating of a generator is typically considered to be the limit based on the machine D curve or capability curve.

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However, the generator bus voltage or auxiliary bus voltage may limit the reactive capability of a particular generator for certain system or operating conditions. Unless the reactive limit in VARs is a single value (which it usually is not), this is normally referred to as an operating limit. However, classifying such a limit as the reactive power “Facility rating” for the generator seems to be what this standard requires. We request clarification on this.

5. Standards approved using the Functional Model paradigm prior to the Functional Model being implemented should require some type of transitional language applying the Standard to a Control Area environment. Future changes to the Functional Model should also be fully coordinated and synchronized with the NERC Standards.

6. Section 604 (d) (1): Need to add Planning Authority and Transmission Planner in this monitoring process to be consistent with 604 (a) (2).

7. Section 603 (a) (4) (v) has wrong references. It should refer to sections located at 603 (a) (4) (i) through 603 (a) (4) (iv).

8. Sections 605 and 606 should include “Transmission Planner and Transmission Operator”. We realize the Standards Drafting team had earlier responded that the Standard does not prohibit the Transmission Operator (or Planner) from participation, but it likewise doesn’t specifically say they are allowed input.

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
- 9 - Federal, State, and Provincial Regulatory or other Govt. Entities

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>MAPP Regional Reliability Council, assisted by the MAPP Operations Subcommittee (members listed below)</i>		Group Representative: <i>Lloyd Linke</i> Representative Phone: 605-882-7500 Representative Email: <i>lloyd@wapa.gov</i>
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Allan Silk</i>	<i>Manitoba Hydro</i>	2
<i>John Swanson</i>	<i>Nebraska Public Power District</i>	2
<i>Paul Koskela</i>	<i>Minnesota Power</i>	2
<i>Larry Larson</i>	<i>Otter Tail Power</i>	2
<i>Darrick Moe</i>	<i>WAPA</i>	2
<i>Dick Pursley</i>	<i>Great River Energy</i>	2
<i>Martin Trence</i>	<i>Xcel Energy</i>	2
<i>Todd Gosnell</i>	<i>Omaha Public Power District</i>	2
<i>Joe Knight</i>	<i>MAPP</i>	2
<i>Robert Coish</i>	<i>Manitoba Hydro</i>	2

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i) - (iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603, 605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

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The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments With the exception of "Category D" disturbances, the system should not be subjected to instability, uncontrolled separation, or cascading.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments Planning Authorities and Transmission Planners should be coordinating their

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

system additions with the people who develop operating guides.

6. Please enter any other comments you have regarding this standard in the space below.

Comments This standard and standard 200, should coordinate with each other, especially if the concept of an IROL is adopted and defined. If this is the case, IROLs should be defined and addressed within this standard

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SAR Commenter Information (For Individual Commenters)

Name Ray Morella
Organization FirstEnergy Corp
Industry Segment # 1
Telephone 330.384.5686
E-mail
 morellar@firstenergycorp.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative: Representative Phone: Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
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Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

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For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments: If the condition indicated above is intended to be covered, as I think it should, it should be stated more directly. Possible wording could be that an outage that will extend through an entire summer or winter peak loading season would apply.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments: It seems that if the planning standards require these events be considered, and there is an Operating Policy 2 that requires adjustment within 30 minutes to avoid cascading outages for a next contingency, that NERC Level Cs should be examined to ensure transfer levels are not exceeded which could cause a cascade for a Level C outage. Having said that, the problem will be setting the bar to measure when the potential exists for a cascading outage.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>SERC Operations Planning Subcommittee</i>	Group Representative: <i>Don Reichenbach</i> Representative Phone: 704-382-3146 Representative Email: dereiche@duke-energy.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Carter Edge</i>	<i>Southeastern Power Administration</i>	4 & 5
<i>William Gaither</i>	<i>South Carolina Public Service Authority</i>	1
<i>Ken Skrobak</i>	<i>Alabama Electric Cooperative</i>	1
<i>Gene Delk</i>	<i>South Carolina Electric and Gas</i>	1
<i>Dan Kay</i>	<i>South Mississippi Electric Power Association</i>	1
<i>Mike Clements</i>	<i>Tennessee Valley Authority</i>	1
<i>Don Reichenbach</i>	<i>Duke Power</i>	1
<i>Lynna Estep</i>	<i>SERC</i>	2
<i>Mike Miller</i>	<i>Southern Company</i>	1

Background Information:

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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
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- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The requirement to recalculate/adjust SOLs post-contingency is not clear. This requirement is ultimately important in maintaining the reliability of the Interconnection. As a best practice, it should indicate that these recalculations/adjustments should be done on an ongoing basis to accommodate system changes (changes in generation, contingencies, etc.) Also, the necessary adjustments vary according to which timeframe is being studied, i.e., real-time is very different from the planning timeframe, with the operational planning timeframe falling somewhere in between. The standard needs clarity in this section and throughout on the differences between the different timeframes (real-time, day-ahead, operational planning, and planning.)

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments The Level C contingencies are very important to test the strength of the system. The analyses on level C contingencies, while not as probable, are somewhat of a stress test of the system and help identify weaknesses in the system. This is a vital test for timeframes other than real-time. Real-time and day-ahead analyses do not need to include any contingencies past N-1. As stated in the response to #1, the standard would benefit from distinct sections for the various timeframes.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments Many of the SDT's responses relied on the Functional Model either in its current form or with the identified necessary changes. It is even stated that the Model is the "foundation" of the standard. It is not practical for the foundation of a standard to be based upon potential future changes to the Functional Model.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments Operating timeframe: Planning must be involved, particularly for stability analyses, given the state of current real-time analyses tools. Although the industry must work towards better online tools for stability analyses, currently most, if not all, entities rely on planning to perform stability studies.

Planning/study timeframe: Planners are necessary for developing SOLs for the study timeframe since SOLs are based not only on the physical characteristics of equipment, but the status and configuration of the system.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments The references and reliance of this standard on the still-evolving Functional Model, with the identified deficiencies (as pointed out by the SDT on page 3 of this document) is bothersome. The standard makes assumptions based on what is believed or hoped will be in a future version of the Functional Model. It would be prudent to wait on a more mature version of the Functional Model before approving standards based upon it.

There is a lack of coordination between Standard 200 and 600 that needs to be resolved.

Section 603 (a) (4) (v): References listed at end of sentence need to be updated to the new format.

Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon. Again, throughout the standard a clear distinction of the timeframes being addressed would be beneficial. (Reference comments under #1 & 2.)

Section 604 (d) (1): The Transmission Planner function should be included in the annual verification process of the Compliance Monitoring Process.

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

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SAR Commenter Information (For Individual Commenters)

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Industry Segment # 5
Telephone 412-858-1635
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative:	
	Representative Phone:	
	Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

Notes to Industry Commenters:

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What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

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- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

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1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The section is confusing on what limits are determined by planning or operating studies.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments Level C should be used in planning studies.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

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Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

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SAR Commenter Information (For Individual Commenters)

Name Ed Riley
Organization California ISO
Industry Segment # 2
Telephone (916) 351-4463
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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SAR Commenter Information (For Groups Submitting Group Comments)		
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List of Group Participants that Support These Comments:		
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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
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The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The intent of Requirement 603 was not clear until reading the explanation that accompanies this question. The limits should be adjusted for changes in topology, if necessary.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments This answer is based on the assumption that by "planning", the Standard refers to a time horizon of less than one year from the operations date, or "real-time or near-time planning", which should then be specified in the Standard. The measurements must be specific and one authority identified as the responsible entity.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments While the CAISO feels that Regional differences are important, and should be supported by NERC, we do not feel that it is appropriate to include specific Regional differences within the framework of the Standards, but rather to include a more generic statement that NERC recognizes that there are Regional differences, and that NERC supports the Regions in enforcing the reliability requirements for such Regions as have identified Regional differences. NERC should specify minimum standards. Regions may have standards which are more stringent. Any variances from NERC Standards could be submitted to and supported by NERC.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.**

Comments While we agree that the drafting team responded to industry comments, we believe that the August 14th Blackout Report might require additions or clarifications to items in this Standard. The CAISO feels that this should be considered in the decision to move forward with this Standard.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments The CISO believes that in some jurisdictions, the Planning Authorities, the Transmission Planners and Transmission Operators contribute to the development of SOL (and also IROL), the standard must be clearly identify which function (authority) is responsible for development of the final product (limits, security ratings or transfer capabilities).

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments 1) Section 603, (a), (3), (i), A): The fourth sentence is confusing when it refers to "curtailment of transfers is not required to maintain the system within the System Operating Limits." If there is loop flow, etc. on the system, curtailment of transfers would be utilized.

2) Section 603, (a), (3), (ii), A), (c.): The CAISO recommends the use of monopole and bipole.

3) Section 603, (a), (3), (iii), A), (e.): The CAISO recommends adding a new letter with the following: "Reactive margin criteria is satisfied if appropriate for the system."

4) Section 603, (a), (3), (iii), A), (g.): The CAISO recommends modifying this section to include "next single contingency". Also, one of the system adjustments could be the cutting in a SPS/RAS.

5) Section 603, (a), (3), (iv), A), (after d.): The CAISO recommends adding a new letter with the following: "Reactive margin criteria is satisfied if appropriate for the system."

6) Section 603, (a), (3), (iv), A), (f.): This is a relaxation of the criteria to allow for interruption of load for a single contingency. The CAISO does not believe we should allow this for the bulk transmission.

7) Section 603, (a), (3), (iv), A), (g.): Probably should modify to include "next single contingency". One of the system adjustments could be the cutting in a SPS/RAS. Again, this is a relaxation of the criteria to allow for interruption of load for a single contingency.

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The CAISO does not believe we should allow this for the bulk transmission

8.) The CAISO feels that the term "Cascading Outage" as currently written is not adequate, or, more specifically, is too broad;

9.) The term "local network" is not defined. The CAISO's recommends, based on previous experiences in attempting to define this term, that the Standard Drafting Team consider replacing this term with the more generally defined, and accepted term "radial".

10.) The CISO has been involved in the IRC's SRC review process and agrees with the comments submitted jointly by the SRC.

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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: NPCC CP9 Reliability Standards Working Group	Group Representative: Guy V. Zito Representative Phone: 212-840-1070 Representative Email: gzito@npcc.org	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Roger Champagne</i>	<i>TransEnergie (Quebec)</i>	<i>1</i>
<i>Ralph Rufrano</i>	<i>New York Power Authority</i>	<i>1</i>
<i>Dan Stosick</i>	<i>ISO New England</i>	<i>2</i>
<i>David Kiguel</i>	<i>Hydro One Networks</i>	<i>1</i>
<i>Barry Gee</i>	<i>National Grid US</i>	<i>1</i>
<i>Al Miller</i>	<i>The IMO (Ontario)</i>	<i>2</i>
<i>Guy Zito</i>	<i>Northeast Power Coordinating Council</i>	<i>2</i>
<i>Kathleen Goodman</i>	<i>ISO New England</i>	<i>2</i>
<i>Tony Elacqua</i>	<i>New York ISO</i>	<i>2</i>

Background Information:

Notes to Industry Commenters:

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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

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- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
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- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
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Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments: NPCC feels the language is insufficient to require recalculation during long-term outages. The Standard needs to specify recalculation of the SOLs and IROLs on a regular basis from real time through planning timeframes or every time that conditions change. The Standard should identify when the limits should be recalculated.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: NPCC feels a statement such as that in NERC Operating Policy 2a Section 1.1, needs to be made consistent with the thought of assessing the effect of "multiple outages of a credible nature".

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments: N/A

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments:

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments; Yes, however we believe the System Operating Limits and the role planners might play are more “near term” or “day ahead” in nature or a planning horizon. We would also stress that the ultimate responsibility for the SOLs resides with the Reliability Authority.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments; NPCC feels there are coordination issues between Standard 200 and this one. Additional work is needed to ensure there is a seamless flow between the two Standards. This lack of coordination has been identified as a concern in the recent Standard 200 balloting.

NPCC feels it is not made clear that System Operating Limits (SOLs) need to be recalculated as the system topology changes. Also time horizons for SOLs should be established. These crucial requirements do not appear anywhere in Requirement 603 or its associated measures.

Definition of Inter-Regional and Intra-Regional, what does an area consist of?

What Transfer Capability time horizon needs to be used and should it be based on peak only?

NPCC feels there must be a clear methodology or practice identified for the establishment of System Operating Limits. The methodology required in Standard 603(a)(3) should either identify an industry wide process for the establishment of SOL (and IROL) directly in the standard or an associated Technical Reference.

In Section 602 b 2 the standard should specify that the schedule that is established is reasonable and can be met.

In Section 603 a 1 the standard needs to indicate which of the entities has ultimate accountability for establishing the operating limits methodology. It is recommended that the Reliability Authority should have this accountability. Without this, multiple methodologies might be used.

In the Compliance section NPCC would again like to voice its opposition to monetary sanctions and feels that market mechanisms and letters of varying degrees of severity be utilized to enforce compliance.

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In Section 603 C 1 i A The following change is requested for our Regional Difference wording;

Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is an acceptable risk and therefore can be excluded. *"Other similar situations can be excluded on the basis of acceptable risk, provided that the Reliability Coordinating Committee specifically accepts each request for exclusion (see Guidelines for Requesting Exclusion to Section 5.1(B) and 6.1(B) of the NPCC basic Criteria for Design and Operation of Interconnected Power Systems[Document B-10])."*

In Section 603 a 4 v references listed are incorrect and from a previous version.

Lastly, the NPCC Regional difference includes references to "normal", "emergency", and "delayed fault clearing". NPCC would like the NPCC Regional Difference to reference its definitions as in NPCC Criteria A-7 to avoid any potential for conflicting NERC definitions of these terms.

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If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name Alan Boesch
Organization Nebraska Public Power District
Industry Segment # 1
Telephone 402-845-5210
E-mail agboesc@nppd.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
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Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments Level C contingencies should not cause cascading instability or uncontrolled separation at system transfers consistent with the limits developed using this methodology.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

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FRCC Comments 1/21/04

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Name Patti Metro on behalf of FRCC members

Organization FRCC

Industry Segment # 2

Telephone 813-289-5644

E-mail pmetro@frcc.com

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<i>Linda Campbell</i>	<i>FRCC</i>	<i>2</i>
<i>Roger Westphal</i>	<i>City of Gainesville</i>	<i>3</i>
<i>Paul Elwing</i>	<i>Lakeland Electric</i>	<i>5</i>
<i>Bob Remley</i>	<i>Clay Electric Cooperative</i>	<i>3</i>
<i>Steve Wallace</i>	<i>Seminole Electric Cooperative</i>	<i>4</i>
<i>Ken Bachor</i>	<i>Seminole Electric Cooperative</i>	<i>4</i>
<i>Charles Wubbena</i>	<i>Seminole Electric Cooperative</i>	<i>4</i>
<i>Garl Zimmerman</i>	<i>Seminole Electric Cooperative</i>	<i>5</i>
<i>Alan Gale</i>	<i>City of Tallahassee</i>	<i>5</i>
<i>Herman Dyal</i>	<i>Clay Electric Cooperative</i>	<i>3</i>
<i>Joe Krupar</i>	<i>Florida Municipal Power Agency FMPA</i>	<i>3</i>
<i>John Shaffer</i>	<i>Florida Power and Light</i>	<i>1</i>
<i>Bob Schoneck</i>	<i>Florida Power and Light</i>	<i>3</i>
<i>Richard Gilbert</i>	<i>Lakeland Electric</i>	<i>3</i>
<i>Mark Bennett</i>	<i>Gainesville Regional Utilities</i>	<i>5</i>
<i>Ron Donahey</i>	<i>Tampa Electric Company</i>	<i>3</i>
<i>Bill May</i>	<i>Florida Municipal Power Agency FMPA</i>	<i>4</i>
<i>Howard Guggle</i>	<i>Progress Energy</i>	<i>3</i>

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Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

This section is very unclear. What is the difference between planning studies and operating studies?

We do not believe that it is clearly stated in Requirement 603 that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection. It is our understanding that this question refers to 603(3)(iv) which states that controlled interruption of load is permitted in subsections (e) and (f).

We do, however, agree that in the example provided that limits would need to be re-established for a loss of equipment that cannot be replaced for an extended period of time.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

There is a need to examine "Level C contingencies" in the planning horizon so the system design can be adjusted to maintain reliable system operations. Some Reliability Authorities or Transmission Operators may want to study selected "Level C contingencies" for some operating horizons because of possible real-time issues.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

FRCC Comments 1/21/04

Comment Form — 2nd Posting of the draft 'Determine Facility Ratings, System Operating Limits, and Transfer Capabilities' Standard

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.**

Comments

The drafting team did a very thorough job in reviewing and addressing the comments provided during the 1st posting.

The explanation of the Compliance portion was very helpful, however in reviewing the standard there are still inconsistencies in the formatting of the Compliance Monitoring Process sections. The format used for Requirements 601, 603, and 605 should also be used for Requirements 602, 604, and 606. Specifically d2 and d3 in 602, 604, and 606 can be combined in the same format used for d1 in 601, 603, and 605.

The Applicability is more clearly defined than the previous standards posted for comment, however there continues to be confusion about the functions vs. entities in the functional model.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments

The Purpose statement should be changed from "To determine Facility Ratings, System...." To "To determine and communicate Facility Ratings, System...."

The Applicability statement references Version 2 of NERC's functional model. We suggest you leave out any reference to the Version of the model. If a new version is approved, would this standard then need to be revised? The proposed Functional Model Working

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Group has the responsibility to review and model revisions so that they do not conflict with existing standards, so we do not think reference to the version is a good idea.

Specific comments on Requirement 601

Requirement 601(a)(3) seems a little confusing. We believe we understand the intent, however we think rewording would provide more clarification. We would suggest rewording the paragraph to something like this : "The methodology in 601(a)(1) shall identify the assumptions used to determine Facility Ratings **and** the method by which ratings of major bulk electric system equipment that compromise the facilities are determined. Equipment types would include, but are not limited to, generators, transmission lines, transformers, terminal equipment, series and shunt compensation devices. References to industry rating practices or other standards (e.g. IEEE, ANSI, CSA) should be included when applied."

601(d)(3) in the Compliance Monitoring Process states that the reset period is connected to non-compliance to 601(a). Shouldn't the compliance monitoring process be linked to the measures which are in (b) rather than the requirements? The measures are supposed to be the specific items to look at to insure that you are meeting the requirement.

In the levels of non-compliance, 601(e)(1) we are somewhat confused about what "one of the items listed in 601(a)(3)" is. We believe that it refers to the assumptions, methods of rating the bulk equipment and references to industry ratings, but are not sure. It really needs to be clarified. This same concern carries for levels two and three as well.

Specific comments on Requirement 602

602(d)(4) in the Compliance Monitoring Process states that the reset period is connected to non-compliance to 602(a). Shouldn't the compliance monitoring process be linked to the measures which are in (b) rather than the requirements? The measures are supposed to be the specific items to look at to insure that you are meeting the requirement.

602(e)(1) states "Some, but not all requested Facility Ratings....." In 602(a), or (b) it is never stated that the RA, PA, TP, Top need to request particular ratings. In the requirements and measures it only states that the TOW and GO have to provide them. Should the request part be expanded?

602(e)(3) requires someone to check the accuracy of the ratings provided against the method identified. Is it intended that the Compliance Monitor be the one to do this? Will the compliance monitor have the expertise and all the information necessary to do this?

Specific comments on Requirement 604

In 604(b)(2), it indicates that the RA's and Top's shall provide system operating limits to TSP's and TOP's. Do they also need to provide it to other RA's?

Specific comment on Requirement 605 and 606

The requirements in 605 and 606 apply to Transfer Capabilities. Is this intended only to be TTC, or is ATC also included? It needs to be clarified.

Overall comment:

In reviewing the standard it appears the applicable entities referenced in requirements 601-604 are those defined in Version 2 of the Functional Model. However, in requirements 605 and 606 which address the Transfer Capabilities, it appears that the Reliability Authority is an entity that monitors/oversees the "big picture" for system reliability especially when discussing interregional communication of information to other entities. This leads us to believe that this is really a Reliability Coordinator type entity that has not been defined in

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the Functional Model. Until this confusion is resolved, it is impossible to create reliability standards that the industry can implement.

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative: Representative Phone: Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments This section does not differentiate sufficiently between planning and operating studies. Sections 603(a)(3)(iii-iv) are unclear as to what studies are being referenced.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments We would answer "Yes" if this applies only to Planning Studies.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments Section 604(b)(2) does not seem to recognize that most System Operating Limits that are supplied in real-time. Limits typically vary with ambient temperature or coincident with system changes but the timing of these events is not predictable. This section infers that System operating Limits are delivered on a schedule.

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SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

X No

Comments System Operating Limits should be recalculated whenever there are significant equipment outages; however, it is clear that load shedding and/or system adjustments are permitted as described in 603 (3) (iv) (e) and (f).

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

X Yes

No

Comments Category C contingencies should be evaluated in the planning horizon so that system design can be adjusted to minimize exposure. Simulation or analysis of category C contingencies in operating time horizons should be at the discretion of the Reliability Authority and Transmission Operators.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments:

A question on the use of outage transfer distribution factors was raised in comments to the 1st draft of the standard (see page 87 of comment_responses12-03). The response was “see response to earlier comment.” No earlier response addressing this question could be found. In order to improve readability of the responses, it is suggested the responses be repeated where relevant rather than referring elsewhere in the document.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

X Yes

No

Comments

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments:

603

The Requirement 603 (a) (3) (ii) should be modified as shown below to make it clear the analysis and/or simulations may not be needed for Contingency 603 (a) (3) (ii) A) (a) (i.e. normally cleared three phase faults).

A) The following single contingencies must be ~~evaluated~~ assessed.

The word assessment is defined in the NERC Planning Standards to make it clear that simulation studies may not be required. In Regions that do not have significant problems with normally cleared three phase faults, the need to conduct dynamic simulations of these faults can be assessed based on periodic stability studies. While most Reliability Authorities have power flow computation tools to permit rapid and large scale simulation of single contingency outages, a similar capability for dynamic simulation of faults is neither common place nor necessary in many Regions.

603

It appears that requirement 603 (a) (3) (iv) is intended to require that operational studies evaluate single contingency outages that are followed by system readjustments and then another single contingency outage. This is reasonable for real time contingency analysis and may be needed on a day ahead basis for a few select contingency pairs. The problem is this requirement language could

be interpreted to mean all possible N-1 outages followed by system readjustments and then any other N-1 outage for all operating time horizons. The level of calculations need to support such an interpretation is neither practicable nor useful. It is recommended 603 (a) (3) (iv) be changed as follows: (iv) Response to Subsequent Contingencies [for key System Operating Limits \(operations studies only\)](#):

604

It is not clear in the language of 604 that the term “schedule” means both when and what. Transmission operators should have the flexibility to request different levels of SOL detail for different time horizons. A Transmission Operator may want to see all SOLs for real time but only selected relevant SOLs for a week ahead time horizon.

605

Requirement 605 (a) (2) could be interpreted to exclude the use of transfer distribution factor cutoffs for ignoring overloads that have a very low sensitivity to transfer. The allowed use of TDF cutoff factors (as described in NERC reference Document: Transmission Transfer Capability – May 1995) should be explicitly identified.

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SAR Commenter Information (For Individual Commenters)

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- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments: For planning, the language "consistent with the planned system condition" is adequate. However, this section should provide more delineation between planning vs. operating. For planning, it is appropriate to consider the existing NERC Category A and B criteria. For the operating time frame, the system may have unexpected equipment outages that degrade System Operating Limits to well below those of the planned case. The goal during operating is to make the system stable for the next worst contingency, regardless of the number of preceding contingencies. (Note that the next worst contingency could consider loss of multiple components, if appropriate.) When a contingency occurs, the System Operating Limit changes immediately. The system must respect the new limit through whatever means are necessary. Therefore, the criteria of 603(a)(3)(iv)(A)(a-g) always apply. For example, in the operating time frame, there is no way to guaranty that a System Operating Limit can be established that does not require interruption of load.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: Loss of multiple components should be considered in establishing System Operating Limits whenever it is deemed appropriate by the responsible entity.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

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SAR Commenter Information (For Individual Commenters)

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Organization Midwest ISO
Industry Segment # 2
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
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For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments This however, shouldn't be arbitrary. Such contingencies should be included when history has shown them possible (a particular right-of way or breaker type having multiple occurrences of a common failure).

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments We can't speak for other Regions.

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Comments

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments

1. MISO is in support of the comments drafted by the ISO-RTO council.
2. There is no mention in this standard regarding coordination with neighboring entities. Transfer capability cannot be determined in a vacuum.
3. There is a common issue with the functional model. Who is the RA? Some people believe it is the current Reliability Coordinator. Some people believe it is typically the existing TO. There will be problems monitoring compliance if it is unclear who is responsible for what. Someone needs to create a table that shows a mapping of current entities and the role they appear to match under the functional model.
4. What if an entity in this standard belongs to multiple Regions? Will there be multiple compliance jeopardy and differing expectations of what is compliance?

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SAR Commenter Information (For Individual Commenters)

Name Peter Burke [on behalf of ATC's Jason Shaver]
Organization American Transmission Company
Industry Segment # 1
Telephone 262-506-6863
E-mail PBurke@atcllc.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
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- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments This requirement is written so that the Reliability Authority, Transmission Operator, Planning Authority, and Transmission Planner shall all document the methodology used. It does not require that they all use the same methodology nor does it address the question of which entity is ultimately responsible. The SDT seems to want these four entities to work together but that is not made a requirement as the standard is currently written.

This standard recognizes that a radial customer is exposed to risk of loss of service but does not address how much risk is acceptable. That leaves an entity free to accept any amount of first contingency risk as long as that risk entails only loss of load and not cascading or wide area outages. This allowance may lead to the unintended consequence of unusually large loads exposed to unusually long outages resulting from first contingency events. For example, through planning, a planned outage, a forced outage, a large load could be left dependent on a large power transformer or underground transmission line. Any limit to what risk is allowed is removed when this standard accepts that a radial load may be put at risk of the next contingency.

Would this rule be applied to the 69 kV transmission system?

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

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Comments

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments I agree that they may play a role in the development of System Operating Limits, but I would strongly suggest that only one entity establish the limits.

I would suggest that the Transmission Operator establish the limits for the area under its control. Most of the System Operating Limits are going to be determined using the Facility Ratings Methodology. The Transmission Operators are closer to the area and in many cases more familiar with the area. They have the ability to use that knowledge to address real-time concerns in cases were a System Operating Limit might need to be updated to accommodate real-time system conditions.

The Reliability Authority also has a role to play in the development of SOL’s but, in many cases, differences within a Reliability Authority’s footprint may lead to many System Operating Limit methodologies. Although it is the Reliability Authority function to direct action to maintain the system under its area within SOL’s, it should not also be given the role as the ultimate SOL decider.

6. Please enter any other comments you have regarding this standard in the space below.

Comments

601(e)(4)

Add the statement: “...Planning Authority for the areas in which the facilities are located within...”

602(a)(1)

What about jointly owned facilities?

Since an entity will be non-compliant if they do not follow their methodology what should be done for jointly owned facilities.

602(a)(2)

In the Functional Model the Transmission Owner (TO) has to provide ratings information to everyone listed in this standard but they also have to supply it to Transmission Service Providers (TSP). Which document should we use and if we use both than if I do not supply it to a Transmission Service Provider do I become non-compliant under this standard?

602(b)(2)

The way this measure is worded the TO would have to provide Facility Ratings on a schedule determined by entities other than themselves. This should be reworded to say: “...on a agreed upon schedule between the TO or Generator Owner (GO) with the RA, PA, Transmission Planner (TP), TSP and Transmission Operator.”

602(d)(2)

The word “randomly” should be removed. How would a Compliance Monitor (CM) ensure that the facilities have been selected randomly?

602(d)(3)

What does the Standard Draft Team (SDT) mean by the words “impacted party”? This could be interpreted to mean a market impact. These standards are being develop to insure reliability not market availability.

602(e)(1)

I’m troubled by the word requested. Nowhere in the requirements was a TO or GO required to provided requested ratings. The requirements are that a TO or GO first establishes, update as required then provide but nothing is mentioned about request for rating.

If the word requested is to remain than they need to make it clear on who’s request a TO or GO has to honor. Though they list RA, PA, TP and Transmission Operator they don’t make a distinction between associated and non-associated RA, PA, TP and Transmission Operators. This could lead to a noncompliance issue if a non-associated RA request ratings from a TO or GO and it is not provided.

Overall Problems with 603.

This standard fails to determine which entity is responsible for developing a methodology. In the Functional Model it seems that the Transmission Operator is the main entity responsible for determining SOLs.

603(c)(1)

The word “the” needs to be added to the following statemet:

“...for “the” following...”

605(b)(1)

In the requirements section the RA and PA need to document the methodology used so why would they need to make it available to themselves?

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605(e)(4)

If the RA and PA have to document the methodology why would they need to request a copy of the methodology?

606(b)(1)&(2)

They need to remove the word “responsible entities” and replace it with a list of the responsible entities.

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Organization Reliant Energy
Industry Segment # 5
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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments In the first posting, Reliant submitted comments that raised concerns about the lack of consistent ATC calculations and methodologies. Reliant understands that the NERC DFR standard is focused on reliability (TTC) and commends the drafting team in adopting the industry comments received that called for the exclusion of ATC from a reliability standard due to its commercial nature. However, Reliant also understands that many entities do not believe

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NAESB should develop a business practice to standardize an ATC methodology due largely in part to the fact that ATC values are derived from many divergent methodologies that are based upon individual TSP and/or Regional reliability needs – particularly in the calculation of CBM. Reliant is a member and active participant in both the NERC and the NAESB organizations and is concerned a lack of standardization of methodologies will lead to inconsistent ATC values and affect both reliability and the markets. Reliant recalls correspondence from 2 NERC members to the NERC Board (4/17/02 Roy Thilly of WPPI and Dave McMillan of Calpine) that described the commercial nature of ATC and called for the removal of ATC methodologies from the existing NERC Planning Standards. In those letters, there was also recognition of the same concern Reliant raises now; that is in the February 2002 Board decision to adopt the revised NERC Planning Standards, NERC continued the possibility of each Region having its own methodology in calculating CBM. Those letters are attached to these comments. Since then, NAESB has been formed to develop commercial standards for the wholesale electric market and NERC has formed the Market Committee to continue NERC activities in the determination of market impacts of reliability standards. Because the DFR Standard removes the ATC and the associated CBM calculation from the reliability requirements, and NAESB has received recommendations that it should NOT pursue the development of standardized ATC business practices, the industry seems to be in a quandary on how to address the consistency of ATC and CBM calculations. The Market Committee should be asked to address the impact on the market of the proposed DFR Standard and provide a NERC position (with possible Board approval) of which standard setting organization should tackle the problem of ATC standard methodology.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments Yes, in fact, the 1-20-04 NERC Recommendation # 14 in response to the August 14 Blackout states: “The Planning Committee within two years shall reevaluate system design, and study criteria, methods and practices, to reevaluate transmission facility ratings methods and practices, and to recommend revisions.”

6. Please enter any other comments you have regarding this standard in the space below.

Comments The DFR Standard appears to lack requirements for TSPs and Regions to coordinate the development of Facility Ratings and System Operating Limits that impact more than a single system. The written discussion to Recommendation # 14 specifically requests that “Reliability Regions will review system design, planning, and study methods and practices within their respective regions to ensure such activities are technically adequate and coordinated among the entities within the region.” The discussion goes on to place the coordination beyond the regional level, “NERC and the Reliability Regions will review the scope, frequency, and coordination of interregional studies, to include the possible need for additional simultaneous transfer studies based on transactional trends.” So, it seems the recommendation calls for NERC to take a lead role in requiring Regions to consider the impacts of market transactions that traverse regional boundaries when assessing transmission facility ratings methods and practices. This last point contemplates coordination of facility ratings by considering market transactions. Is this not what ATC is

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about? How will industry embody such a requirement? Should there be a ATC coordination requirement? Will NERC expect Regional Councils or NAESB be the organization(s) to propose any ATC coordinated calculation methodology to complement the NERC DFR standard?

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Note — This form is to be used to comment on version 2 of the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard.

Comments will be accepted from December 1, 2003–January 21, 2004.

Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name	Chifong Thomas
Organization Subcommittee	WECC-Technical Studies
Industry Segment # 2	
Telephone	(415) 973-7646
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
- 9 - Federal, State, and Provincial
Regulatory or other Govt. Entities

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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>WECC Technical Studies Subcommittee</i>	Group Representative: <i>Peter Mackin</i> Representative Phone: 916-631-3200 Representative Email: <i>pmackin@navigantconsulting.com</i>	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Peter Mackin</i>	<i>Transmission Agency of Northern California</i>	<i>1</i>
<i>John Collins</i>	<i>Platte River Power Authority</i>	<i>1</i>
<i>Jay Seitz</i>	<i>US Department of Interior Bureau of Reclamation</i>	<i>4</i>
<i>Chuck Russell</i>	<i>Salt River Project</i>	<i>1</i>
<i>Craig Quist</i>	<i>PacifiCorp</i>	<i>1</i>
<i>Peter Krzykos</i>	<i>Arizona Public Service Company</i>	<i>1</i>
<i>C.V. Chung</i>	<i>Seattle City Light</i>	<i>4</i>
<i>David Barajas</i>	<i>Imperial Irrigation District</i>	<i>1</i>
<i>Vance Crocker</i>	<i>Black Hills Power</i>	<i>1</i>
<i>Mathew Stoltz</i>	<i>Basin Electric Power Cooperative</i>	<i>1</i>
<i>Kenneth Dillon</i>	<i>Portland General Electric Company</i>	<i>1</i>
<i>Mark Hanson</i>	<i>Idaho Power Company</i>	<i>1</i>
<i>Chuck Stigers</i>	<i>NorthWestern Energy</i>	<i>1</i>
<i>Abbas Abed</i>	<i>San Diego Gas and Electric Company</i>	<i>1</i>
<i>Joe Seabrook</i>	<i>Puget Sound Energy</i>	<i>1, 3</i>
<i>Milt Percival</i>	<i>Western Area Power Administration - DSW</i>	<i>1</i>
<i>Tom Green</i>	<i>Public Service Company of Colorado</i>	<i>1</i>
<i>Dana Cabbell</i>	<i>Southern California Edison Company</i>	<i>1</i>
<i>Joe Tarantino</i>	<i>Sierra Pacific Power Company</i>	<i>1</i>
<i>Ben Morris</i>	<i>Pacific Gas and Electric Company</i>	<i>1</i>
<i>Phil Park</i>	<i>British Columbia Transmission Corporation</i>	<i>1</i>

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<i>Gary DeShazo</i>	<i>CAISO</i>	<i>2</i>
<i>Pamela Johnson</i>	<i>Southwest Transmission Cooperative, Inc.</i>	<i>1</i>
<i>John D. Martinsen</i>	<i>Snohomish County Public Utility District</i>	<i>4</i>
<i>Mary Ann Tilford</i>	<i>Tucson Electric Power</i>	<i>1</i>
<i>Pamela Mclean</i>	<i>Alberta Electric System Operator</i>	<i>2</i>

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i) - (iv)).
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The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments The WECC TSS feels that these contingencies should be examined as is the current practice in WECC. However, this additional level of analysis can be implemented as a Regional Standard specific to WECC.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments *WECC is requesting a "Regional Difference" as shown in the attached file.*

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments The WECC TSS believes that all of its previous comments were adequately addressed.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

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No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments The WECC TSS would like to complement the SDT on this revised draft standard. It is obvious that a great deal of effort has been expended in developing the draft and in responding to industry comments.

We have some additional minor comments on Draft 2:

(1) Some of our reviewers are not sure why the definition for “Cascading Outages” was changed to exclude the second sentence, “Cascading results in widespread electric service interruption, which cannot be restrained from sequentially spreading beyond an area predetermined by appropriate studies”. This second sentence would clarify the extent of the outages and should be included.

(2) Some of our reviewers were confused by the definition of Facility. It might be helpful to also define Equipment. This additional definition would help clarify the Facility definition. A draft definition for Equipment is provided below:

Equipment: A single piece of electrical apparatus that can comprise a portion of a Facility and that has ratings that may limit the capability of the Facility of which the electrical apparatus is a part. Examples of Equipment include: disconnect switches, circuit breakers, generator excitation systems, line voltage regulators, and line conductors.

(3) We are confused about the use of the “minimum” values in the definition of SOL, since, depending on the specific value referenced, these terms may not be applicable. (For example, what would a minimum current limit apply to?) We understand that the definition must be broad enough to cover limits that are set based on parameters other than MW or MVAR flows. Perhaps rewording the definition by separating it into two parts and some examples may help.

(4) Standard 200 refers to the Interconnection Reliability Operating Limit (IROL) as a subset of SOLs and only would enforce that subset of limits. Standard 600 does not refer to IROLs or explain/identify the requirement for documenting the methodology and developing these specific limits, unless it is implied in 603 and 604. 600 and 200 need to be linked.

(5) 601(a)(3) is a long sentence. We suggest rewording for readability, as follows:

“The methodology required in 601(a)(1) shall identify the assumptions used to determine Facility Ratings, including:

- the method by which ratings of major bulk electric system equipment types that

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comprise the Facilities* are determined and

- references to industry rating practices or other standards (e.g., IEEE, ANSI, CSA), when applied.

*Facilities for which rating methodologies are required include, but are not limited to,

- generators,
- transmission lines,
- transformers,
- terminal equipment, and
- series and shunt compensation devices”

(6) Section 601(d)(2) allows entities one year to get in compliance after adoption of the Standard. This is a very tight time frame and significant reporting burden; after all it generally takes longer than a year to just write a standard. We suggest a longer time frame for entities to initially comply. Similar comment for 603(d)(2) and 605(d)(2).

(7) 601(e) Levels of noncompliance. Suggest adding words on all levels to the effect that the non-compliance levels do not address non-*applicable* items. We have seen confusion on noncompliance levels where missing items would determine noncompliance when some of the items listed may not be applicable to all entities

(8) Section 602(b)(1) states: “Responsible entities shall establish their Facility Ratings consistent with their ratings methodology, described in 601(a).” Section 601(a) does not describe any ratings methodology, it cites the requirement for a methodology. We suggest a little wordsmithing, rewriting the sentence to read: “Responsible entities shall establish their Facility Ratings consistent with their ratings methodology required by 601(a).”

(9) Section 602(d): Once this standard is approved, it does not seem reasonable to expect entities to have ratings for all facilities completed immediately. There should be a reasonable period of time to allow organizations to complete facility ratings. We suggest a three-year period.

(10) Levels of noncompliance in section 602(e) are cumbersome. Identify whether “some” ratings were not provided would also require considerable tracking of rating information.

(11) The references to 603.1.4.4-603.1.4.4 in 603(a)(4)(iv) on page 8 should probably be changed to 603(a)(4)(i)-603(a)(4)(iv).

(12) Please move the last sentence in section 603(a)(3)(i)(A), “Curtailed load or transfers is not required to maintain the system within the System Operating Limits”, to section 603(a)(3)(i)(B). This change would remove the potential conflict between 603(a)(3)(i)(A) and 603(a)(3)(i)(C) and allow the operators the flexibility to curtail transmission service if deemed necessary to accommodate planned maintenance.

(13) In section 603(a)(3)(ii) requires the evaluation of “(a) Single line to ground or 3-phase fault, with Normal Clearing, on *any* faulted Facility”. The previous draft showed a Table I, which specifies “single line to ground or 3-phase fault, with normal clearing on, Generator, Transmission Circuit, or Transformer”. Since “any Facility” includes more than those specified in Table I, for example, faults on bus sections, this draft appears to be more stringent than the previous version. Please replace “any faulted Facility” with “any faulted Generator, Transmission Circuit, or Transformer”.

(14) Please replace 603(a)(3)(iv)(e) with footnote d from Table I. Footnote d states:

“Depending on system design and expected system impacts, the controlled interruption of electric supply to Customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of

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the interconnected transmission systems.”

Footnote (d) applies to Category C contingencies (N-1-1), which is more in line with operating studies.

(15) In section 603(a)(3)(iv)(f) and (g), we allow interruption of firm load for operating studies, but make no mention of interruption of contracted firm transfer. This would put contracted firm transfer ahead of firm load. Please change these sections to allow for interrupting "contracted transfer" if needed.

(16) In section 603(c)(1)(i) there is no mention of single line-to-ground faults with normal clearing on a bus section or a circuit breaker (failure or internal fault) as in the previous version of the draft. Was this intentional or was it an oversight?

(17) Section 603(e)(1) might be clearer if a parenthetical reference was made to section 603(a)(2) since that section [603(a)(2)] is also referenced in non-compliance level 3 just below in section 603(e)(3).

(18) Sections 602, 604 and 606 have no requirements for periodic review and update of the ratings established in 602 – Establish and Communicate Facility Ratings, 604 – Establish and Communicate System Operating Limits, and 606 – Establish and Communicate Transfer Capabilities. To assure the ratings are still current and accurate we believe this issue should be addressed by the standard.

(19) In section 605(a)(2) “The methodology required in 605(a)(1) shall state that Transfer Capabilities shall adhere to all applicable System Operating Limits”. Please change “adhere to” to “remain within” because as written, this section could be interpreted as the Transfer Capabilities shall be the same as all applicable System Operating Limits.

603 System Operating Limits Methodology

c. Regional Differences

2. The following Regional Difference shall apply only in the Western Electricity Coordinating Council (WECC). The WECC methodology required in 603(a)(1) shall require that System Operating Limits be established for following system conditions, in addition to those listed in 603(a)(3)(i)
 - i. Single Contingencies
 - A) The following single contingencies must be evaluated:
 - a. Single line to ground or 3-phase fault, with Normal Clearing, on any faulted Generator, Transmission Circuit or Transformer.
 - b. Loss of any Facility without a fault.
 - c. Single pole block, with Normal Clearing, in a monopolar or bipolar HVdc system.
 - B) System Operating Limits shall be established such that for contingencies in 603(c)(2)(i)(A) operation within the System Operating Limit shall provide system performance consistent with that prescribed in 603(a)(3)(iii)–603(a)(3)(iv) above.
 - ii. Multiple Contingencies
 - A) In addition to the single Facility contingencies listed in 603(c)(2)(i)(A), the following multiple Facility contingencies must also be evaluated when establishing System Operating Limits:
 - a. Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is an acceptable risk and therefore can be excluded.
 - b. A permanent phase to ground fault on any generator, transmission circuit, transformer, or bus section with Delayed Fault Clearing except for bus sectionalizing breakers or bus-tie breakers addressed in (g) below.
 - c. Simultaneous permanent loss of both poles of a direct current bipolar facility without an AC fault.
 - d. The failure of a circuit breaker associated with a special protection system to operate when required following: the loss of any element without a fault; or a permanent phase to ground fault, with Normal Clearing, on any transmission circuit, transformer or bus section.

WECC Regional Difference

- e. Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on separate towers in a common right-of-way, with Normal Clearing.
 - f. A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by Standard 603.
 - g. The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground fault.
- B) System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(a)- 603(c)(2)(ii)(d) operation within the System Operating Limit shall provide system performance consistent with the following:
- a. All Facilities are operating within their applicable post-contingency thermal, frequency and voltage limits.
 - b. Cascading outages do not occur.
 - c. Uncontrolled separation of the system does not occur.
 - d. The system demonstrates transient, dynamic and voltage stability.
 - e. Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.
 - f. Interruption of firm transfer, load or system reconfiguration is permitted through manual or automatic control or protection actions.
 - g. To prepare for the next contingency, system adjustments are permitted, including changes to generation, load and the transmission system topology when determining limits.
- C) System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(e) operation within the System Operating Limit shall provide system performance consistent with the following with respect impacts on other systems:
- a. All Facilities are operating within their applicable post-contingency thermal, frequency and voltage limits.
 - b. Cascading outages do not occur.
 - c. Uncontrolled separation of the system does not occur.
 - d. The system demonstrates transient, dynamic and voltage stability.
 - e. Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.

WECC Regional Difference

- f. Interruption of firm transfer, load or system reconfiguration is permitted through manual or automatic control or protection actions.
 - g. To prepare for the next contingency, system adjustments are permitted, including changes to generation, load and the transmission system topology when determining limits.
- D. System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(f) – 603(c)(2)(ii)(g) operation within the System Operating Limit shall provide system performance consistent with the following with respect to impacts on other systems:
- a. Cascading outages do not occur.
- E. When planning systems and facilities, WECC may make changes (performance category adjustments) to the contingencies required to be studied and/or the required responses to contingencies based on actual system performance and robust design. Such changes will apply in determining System Operating Limits.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

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If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>Standards Review Committee of the ISO/RTO Council</i>		Group Representative: <i>Bruce Balmat</i> Representative Phone: <i>610-666-8860</i> Representative Email: <i>balmatbm@pjm.com</i>
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Karl Tammar</i>	<i>NY ISO</i>	<i>2</i>
<i>Carl Monroe</i>	<i>SPP</i>	<i>2</i>
<i>Ed Riley</i>	<i>Cal ISO</i>	<i>2</i>
<i>Don Tench</i>	<i>IMO</i>	<i>2</i>
<i>Dave LaPlante</i>	<i>ISO-NE</i>	<i>2</i>
<i>Bruce Balmat</i>	<i>PJM</i>	<i>2</i>
<i>Bill Phillips</i>	<i>MISO</i>	<i>2</i>

Background Information:

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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

Include requirements that:

- Limits need to be modified for topology changes.
- Tools or procedures should be required to allow this modification to ratings in real-time (or close to real time).
- Standard rating practices should be identified to provide consistent methodologies for determining ratings, security limits or transfer capabilities.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

There should be clear delineation of the time frame being reviewed and analyzed for multiple credible outages. The Planning arena and the real-time Operations expectations must be spelled out with specific measurements and non-compliance elements for each.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Comments

While regional differences are important, and should be supported by NERC, it may not be appropriate to include specific Regional differences within the framework of the Standards. Rather, there should be a more generic statement that NERC recognizes that there are Regional differences, and that NERC supports the Regions in enforcing the reliability requirements for such Regions that have identified Regional differences. Regions may have Standards which are more stringent. Variances to NERC Standards would still be expected to be included in the NERC Standards.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments

While we recognize that in some jurisdictions, the Planning Authorities, the Transmission Planners and Transmission Operators play a role in the development of SOL (and also IROL), it must be clear and unambiguously identified in this set of Standards which function (authority) is responsible for development of the final product (limits, security ratings or transfer capabilities).

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments

There should be a requirement for coordination of the calculation of limits between planning authorities and reliability authorities.

There should be a requirement for coordination of the calculation of limits with neighboring systems.

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SAR Commenter Information (For Individual Commenters)

Name Ed Riley
Organization California ISO
Industry Segment # 2
Telephone (916) 351-4463
E-mail eriley@caiso.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
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	Representative Phone:	
	Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The intent of Requirement 603 was not clear until reading the explanation that accompanies this question. The limits should be adjusted for changes in topology, if necessary.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments This answer is based on the assumption that by "planning", the Standard refers to a time horizon of less than one year from the operations date, or "real-time or near-time planning", which should then be specified in the Standard. The measurements must be specific and one authority identified as the responsible entity.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments While the CAISO feels that Regional differences are important, and should be supported by NERC, we do not feel that it is appropriate to include specific Regional differences within the framework of the Standards, but rather to include a more generic statement that NERC recognizes that there are Regional differences, and that NERC supports the Regions in enforcing the reliability requirements for such Regions as have identified Regional differences. NERC should specify minimum standards. Regions may have standards which are more stringent. Any variances from NERC Standards could be submitted to and supported by NERC.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.**

Comments While we agree that the drafting team responded to industry comments, we believe that the August 14th Blackout Report might require additions or clarifications to items in this Standard. The CAISO feels that this should be considered in the decision to move forward with this Standard.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments The CISO believes that in some jurisdictions, the Planning Authorities, the Transmission Planners and Transmission Operators contribute to the development of SOL (and also IROL), the standard must be clearly identify which function (authority) is responsible for development of the final product (limits, security ratings or transfer capabilities).

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments 1) Section 603, (a), (3), (i), A): The fourth sentence is confusing when it refers to "curtailment of transfers is not required to maintain the system within the System Operating Limits." If there is loop flow, etc. on the system, curtailment of transfers would be utilized.

2) Section 603, (a), (3), (ii), A), (c.): The CAISO recommends the use of monopole and bipole.

3) Section 603, (a), (3), (iii), A), (e.): The CAISO recommends adding a new letter with the following: "Reactive margin criteria is satisfied if appropriate for the system."

4) Section 603, (a), (3), (iii), A), (g.): The CAISO recommends modifying this section to include "next single contingency". Also, one of the system adjustments could be the cutting in a SPS/RAS.

5) Section 603, (a), (3), (iv), A), (after d.): The CAISO recommends adding a new letter with the following: "Reactive margin criteria is satisfied if appropriate for the system."

6) Section 603, (a), (3), (iv), A), (f.): This is a relaxation of the criteria to allow for interruption of load for a single contingency. The CAISO does not believe we should allow this for the bulk transmission.

7) Section 603, (a), (3), (iv), A), (g.): Probably should modify to include "next single contingency". One of the system adjustments could be the cutting in a SPS/RAS. Again, this is a relaxation of the criteria to allow for interruption of load for a single contingency.

Comment Form — 2nd Posting of the draft 'Determine Facility Ratings, System Operating Limits, and Transfer Capabilities' Standard

The CAISO does not believe we should allow this for the bulk transmission

8.) The CAISO feels that the term "Cascading Outage" as currently written is not adequate, or, more specifically, is too broad;

9.) The term "local network" is not defined. The CAISO's recommends, based on previous experiences in attempting to define this term, that the Standard Drafting Team consider replacing this term with the more generally defined, and accepted term "radial".

10.) The CISO has been involved in the IRC's SRC review process and agrees with the comments submitted jointly by the SRC.

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SAR Commenter Information (For Individual Commenters)	
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1 – Trans. Owners
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Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

X No

Comments: This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments: This should be a requirement for Planning Horizon SOLs. However, real-time and day-ahead SOLs need only consider the next N-1 contingencies.

The Level C contingencies are very important to test the strength of the system. The analyses on level C contingencies, while not as probable, are somewhat of a stress test of the system and help identify weaknesses in the system. This is a vital test for timeframes other than real-time. Real-time and day-ahead analyses do not need to include any contingencies past N-1. The standard would benefit from distinct sections for the various timeframes.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

X No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

The drafting team responded as follows to the question regarding the NPCC proposed regional difference (draft 1 comments, question 3).

Response: The drafting team understands this position. However, the NERC process allows Regions to seek incorporation of more stringent requirements if they desire. The manual allows for Regional differences as long as they:

- o Are developed in fair and open process*
- o Do not have a significant adverse impact on commerce that is not necessary for reliability*
- o Provide an appropriate level of bulk system reliability*
- o Are based upon a justifiable difference between Regions or subregions*

The response above was listed nine times in the responses document for the first posting. Based on the comments to question 3 on the first posting, the drafting team response is inadequate. Due to the multiple views of the original intent of recognizing regional differences, the drafting team should forward the feedback to the appropriate entities in NERC to review this interpretation.

More stringent requirements for a Region should be managed and determined by the Region's members, not all of North America.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments: Operating timeframe: Planning must be involved, particularly for stability analyses, given the state of current real-time analyses tools. Although the industry must work towards better online tools for stability analyses, currently most, if not all, entities rely on planning to perform stability studies.

Planning/study timeframe: Planners are necessary for developing SOLs for the study timeframe since SOLs are based not only on the physical characteristics of equipment, but the status and configuration of the system.

6. Please enter any other comments you have regarding this standard in the space below.

Comments:

1. Section 603 (a) (4) (v): References listed at end of sentence need to be updated to the new format.
2. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?
3. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon. Throughout the standard a clearer distinction of the timeframes being addressed would be beneficial.
4. Section 604 (d) (1): The Transmission Planner function should be included in the annual verification process of the Compliance Monitoring Process.

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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- 8 - Small Electricity Users
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>Bonneville Power Administration - Transmission Business Line</i>	Group Representative: <i>Mike Viles</i>	
	Representative Phone: 360 418-2322	
	Representative Email: mrviles@bpa.gov	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Kyle Kohne</i>	<i>BPA</i>	<i>1</i>
<i>Ravi Aggarwal</i>	<i>BPA</i>	<i>1</i>
<i>Don Gold</i>	<i>BPA</i>	<i>1</i>
<i>Marv Landauer</i>	<i>BPA</i>	<i>1</i>
<i>Barbara Rehman</i>	<i>BPA</i>	<i>1</i>
<i>Jamie Murphy</i>	<i>BPA</i>	<i>1</i>
<i>Dick Spence</i>	<i>BPA</i>	<i>1</i>
<i>John Kerr</i>	<i>BPA</i>	<i>1</i>

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
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The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments We believe that it is prudent to examine "Level C contingencies" when planning the system but that decision should left up to the regions.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments WECC is requesting a "Regional Difference". See comments from WECC Technical Studies Subcommittee.

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments

Definition comments:

1. Definition of Cascading outages does not match the existing definition that was laboriously reviewed within NERC (the last sentence of the old definition was not included here). The widespread component of cascading in the original definition is important – some local cascading could be acceptable and must be preserved.
2. The Facility Rating definition includes another term “applicable rating” that corresponds to a single piece of equipment. However there is a separate definition for Equipment Rating. Are Equipment Rating and applicable rating one and the same?
3. Since the term Transfer Capability as defined is not used in the Western Interconnection it would be helpful for more information explaining how the transfer capability is used in the Eastern Interconnection. The Western Interconnection uses the term Operating Transfer Capability that fits the definition for System Operating Limit. We suggest providing an example of a Transfer Capability and how it may relate to System Operating Limits in a technical reference for this standard.
4. The standard needs a definition for the occurrence period referred to in the compliance section.

Comments to specific sections

Section 601.a.2: Refers to applicable ratings, not equipment ratings. We suggest that “applicable ratings” be changed to “applicable equipment ratings” to be consistent with the “equipment rating” definition.

Section 601.d.3, second sentence: Please clarify what “data” needs to be kept.

Sections 601.e.1, 601.e.2.i, and 601.e.3.i: Replace the word “item” with “applicable equipment types”. This eliminates the mixing of items and equipment types in section 601.e.

Sections 602.b.1 and 602.b.2: Replace the term “Responsible entities” with “The Transmission Owner and Generator Owner” to be consistent with terms used in Section 602.a.

Section 602.b.2, third line: Add “associated “ before “Reliability Authority “ to clarify that the Facility Ratings do not need to be provided to entities that do not need them.

Section 603.a.3.i.A: In the second sentence replace “pre-contingency thermal and voltage limits” with “applicable facility ratings”. The steady-state condition may follow a contingency so a pre-contingency limit may not be applicable. Not all facility ratings are based on thermal or voltage limits. For example series capacitors can be current limited due to dielectric limits.

Remove the last sentence. In real-time operations the pre-contingency condition could follow a contingency and it may be necessary to curtail load or transfers to maintain the system within the System Operating Limits.

Section 603.a.3.i.B: Replace “steady-state” with “system “. The term steady-state exists pre-contingency and post-contingency and can be confusing when it is only used in the pre-contingency discussion. Also replace “maintenance” with “outages that may impact System Operating Limits during the period of the planning study”. The planned outages may be related to construction, or equipment failures in addition to maintenance. Not all outages will have an impact on System Operating Limits and this allows some flexibility in determining which outages need to be included in the planning study.

Section 603.a.3.i.C: Replace “steady-state” with “system”. The term steady state exists pre-contingency and post-contingency and can be confusing when it is only used in the pre-contingency discussion.

Section 603.a.3.ii.A.a: Revise to read as “Loss of any facility with single line to ground or 3-phase fault (whichever is more severe) with Normal Clearing. This clarifies that the faulted facility is permanently lost.

Section 603.a.3.iii: The “planned system” needs clarification since there are future planning studies and there are near term operational studies that include planned outages for construction and maintenance.

Section 603.a.3.iii.A.a: Suggest replacing the sentence with: All facilities are operating within their applicable facility ratings.

Section 603.a.3.iv: We are not sure what the term “Subsequent Contingency” means? The only difference between the response for the planned system (Section 603.a.3.iii) and this section is the option to interrupt load in response to the contingency. This difference is consistent with the difference between planning studies and operational studies but the term “subsequent contingency” implies closely following the previous contingency which also implies there may not be time for system readjustment. Is that what is intended? If it is, it needs to be clarified.

Section 603.a.3.iv.A.a: Suggest that “post-contingency thermal, frequency and voltage limits” be changed to “facility ratings”.

Section 603.a.4.v: Refers to Sections that do not exist. It looks like it should be Sections 603a.4.i-iv.

Section 603.c.1, second sentence: Add “the” preceding “following”.

Section 604: Does the Balancing Authority need to be included in this section to receive System Operating Limits applicable to scheduled paths?

Section 605.a.3.v: Include 605.a.3.i-iv not just 605.a.3.i.

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SAR Commenter Information (For Individual Commenters)

Name	Khaqan Khan
Organization	Independent Electricity Market Operator
Industry Segment #	2
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E-mail	khaqan.khan@theIMO.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:		Group Representative: Representative Phone: Representative Email:
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

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For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

It is not clear in Standard 603 that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection.

Additionally, the IMO has some fundamental concerns with Standard 603.

Firstly, while the standard 603 promotes a post performance criteria that must be observed, there is no clear methodology or practice identified for the establishment of System Operating Limits. For example, Standard 601 (a)(3) identifies industry rating practices or other standards (IEEE, ANSI, CSA etc) to provide for a consistent methodology to be used in the establishment of ratings across the industry.

It is the IMO's position that a consistent methodology or acceptable industry practices should be identified 603(a)(4) to recognize the acceptable and critical assumptions and methods for addressing items (i to v) when satisfying the post performance criteria in Standard 603(a)(3). This should ensure the methodology used by one RA to determine System Operating Limits (and IROL) do not place another RA's jurisdictions at risk.

With regards to 603(a)(4), the methodology must also address the scope of assumptions, i.e. the assumptions must be wide enough to recognize electrical performance, not just owner or jurisdictional territory.

These comments can be equally applied to the methodologies for 605.

Secondly, it is not clear that System Operating Limits (SOL) need to be recalculated as the system topology changes anywhere in Requirement 603 or its associated measures.

To make it clear, the IMO believes a statement, similar to the one used in the Operate Within IROL Requirement 201 Measure 1.i should be included so that there is no mistake with respect to the requirement to revise SOL's as topology changes. (201.b.1.i states, "the RA shall have evidence that it reviews and updates the list of facilities to reflect changes in

system topology").

The example above, leads one to believe that SOLs only need to be recalculated where the outage is of an extended nature. While this may be true for a base set of limits for the planning time frame, in fact all SOLs (and IROLs) need to be constantly reviewed and revised (or have the training and tools available to establish safe operating postures following a contingency) to reflect the real-time system configuration. If this action is not taken, the RA or other authority will not be able to respect T_v , as stated in Standard 200.

Therefore this requirement should not only identify a need to revise the SOL, but should also indicate the timeliness of updates to cover both the planning and the real-time determination of SOLs (and IROL).

The IMO is not advocating that the "Authorities" operators have SOLs available to them for all the possible configurations. Rather the IMO believes that these operators should have the capability (Tools and / or Training) at their disposal to identify and deal with unforeseen circumstances or conditions where they are no longer operating within the boundaries of the studied limits.

As a minimum, the operators should have at their disposal a base set of limits that include N-1 configurations, along with identifying the following:

- *The boundary conditions for which the published limits are applicable,*
- *The critical contingency that drive the applicable limit and*
- *An understanding of what the associated limit is designed to protect the system against (i.e. transient stability, voltage decline etc)*

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

The Current NERC Policy 2 A section 1.1 states: " Multiple outages of a credible nature, as specified by Regional policy, shall also be examined and, when practical, the CONTROL AREAS shall operate to protect against instability, uncontrolled separation, or cascading outages resulting from these multiple outages."

The spirit of this statement should be embodied in this standard to ensure that as a minimum, assessments are made of conditions and circumstances where there may be a need to respect multiple contingencies they are respected.

The IMO believes that as a minimum, there are attributes of the NPCC policy with respect to multiple element coverage that can be beneficial to the interconnection.

For example, for unexplained automatic operations, it may be prudent to operate to a higher level of security (i.e. operate to SOLs that include multiple outages) until the cause of the outage has been positively identified.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

Yes- the drafting team made efforts to provide response

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

While the IMO recognizes that in some jurisdictions, the Planning Authorities, the Transmission Planners and Transmission Operator play a role in the development of SOL (and also IROL). It must be clear and unambiguously identified in this set of Standards that only one function i.e., the Reliability Authority is responsible for the final product.

Emphasis: *The RA should be responsible for the SOLs that are used in real-time operation and for near-term operation.*

Without a single entity being responsible for the development of "limits" it is entirely conceivable that the results of various studies required for the development of SOL (and IROLs) may not reflect current system configuration. Hence there is a risk of incomplete or incorrect limit coverage.

Additionally, the use of a single entity ensures a more consistent application of the development methodology, the distribution of limits and lastly, application of the limits being assessed in both the planning and real-time periods.

Since IROLs (which are a subset of SOLs) are the responsibility of the RA to identify, monitor, analyze and take actions on (Standard 201, 202, 203 and 204) it is the IMO's position that this responsibility to ensure System Operating Limits are derived should rest with the RA.

The above comments are also applicable to 603 (a) and 604 (a).

This thought process is consistent with Requirement 1 and the associated Principles

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

(Requirements for establishing and Communicating Limits) contained in the OLD-TF Report accepted by NERC:OC in March of 2003.

Additionally some of the comments NERC received in the balloting of Standard 200 indicate concerns over lack of coordination. In one submission, it was stated "There must be an express provision stating that Reliability Authorities have authority over all entities with facilities or operating within the RA's footprint" (PSEG). In this case the reference was to prevent instances of exceeding an IROL but the principle should be equally applied to the Derivation and Identification of the SOL (and hence IROL).

6. Please enter any other comments you have regarding this standard in the space below.

(1) The IMO is concerned about an apparent lack of coordination between Standard 200 and Standard 600.

The backgrounder for this comment form correctly identifies that IROLs are a subset of SOLs. The backgrounder goes further to state that the intent of this standard " is to identify all system operating limits and not to differentiate them based upon the impacts of violating them".

While, this may be true, the statement raises a coordination issue between this Standard 600 and Standard 200.

For example Standard 201 requires the RA to identify IROL Facilities, however it makes no reference on what "Function" has the requirement to determine / derive the IROL Limit. Therefore, Standard 600 must define the need to determine when a limit has a wide area impact.

As a first step, Standard 603(4) should include a requirement to describe the methodology used to determine the local and wide spread impact used to determine whether a limit is an SOL or an IROL.

(2) While Standard 602(a) (2) and 604(a)(2) and the associated measure identify a schedule for the transfer of Limits and Transfer Capability, the standard must recognize the need to provide the Ratings, Limits (SOL and IROL) and Transfer Capability to the required entities that must implement them in a timely manner. Having the best ratings or limits does not ensure the reliability of the system if they are not available to the appropriate authorities on the timeline required for their specific application. Based on the comments in # 5 above, the Reliability Authority should provide the limits to those who require them. Also it is not clear of the context of the word "associated" in 604 (2a).

The following comments are offered with regards to Compliance Monitoring Process.

(3) *There is a need to define the entity responsible for the role of a compliance monitor. Would it be NERC, the Region, the Reliability Authority or Control area or all.*

(4) *The Sanction Matrix needs clear instructions on how to interpret the two sanction tables outlined at the end of the standard 600.*

(5) *There is no clear process or mode defined in standard 602(d) for the Compliance Monitor to verify Facility Ratings.*

Note: The IMO also agrees with the comments submitted by ISO/RTO Standards Review Committee (SRC) of the ISO/RTO Council (IRC)

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name Robert W Waldele
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Industry Segment # 2
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
- 9 - Federal, State, and Provincial Regulatory or other Govt. Entities

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative: Representative Phone: Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The section now seems to gray the boundary between planning and operating studies. One can get the impression that “day-ahead” is planning, and real-time is operating. This question and example seem to raise a concern that system operating limits do NOT have to be adjusted for a short-term outage: 603.a.3.iv should clearly state (at the outset) that following a contingency “System Operating Limits” (may) need to be (re) determined.

2. Do you see a need for contingencies known in the current NERC Planning Standards as “Level C contingencies”, such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments These are normal criteria contingencies in the NPCC Areas. Systems/Areas/Regions that do not have the stringent design criteria similar to NPCC should evaluate system response to these types of contingencies as a relative measure of system strength (robustness). In particular, delayed clearing events are not always the result of breaker failure, but could result from protection failure (where there may not be redundant protection groups).

The standard needs an explicit reference to the contingencies and their application. Absent an explicit statement, this standard can only be viewed as a weakening of the reliability goals of Operating Policy P2.A.1.1

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments The drafting team still has not offered any evidence that monetary sanctions will be more effective at achieving compliance with this (or any other) standard. We are concerned that monetary sanctions may result in planning or operating entities doing a cost/benefit analysis of the “cost of compliance” vs. the benefit of “not getting caught.”

This draft is no closer to respecting the reliability goals of the original Operating Policies. There is a lack of clarity, and references to multiple entities does not establish a hierarchy of command and control where the RA should have the ultimate responsibility.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments The references to day-ahead as a “planning” study to be performed by planners confuses the concept of operating studies: day-ahead and real-time assessment of system operating limits should be performed using the same criteria/methodology by the same personnel. Further, it is not clear what the “longer term” horizon is (weeks?, months?) and Transmission Planners and Planning Authorities should be cognizant of the methodologies used in the development of System Operating Limits, but the determination of operating limits should be the responsibility of the operations engineering/security analysis staff of the Reliability Coordinator.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments Sections 604, 605 and 606 make references to “responsible entities.” There is a concern that this may lead to conflicting objectives among the reliability authority, transmission planner, etc. Further, the phrase “schedule established by the transmission operators and transmission service providers” weakens the role of the Reliability Authority. The RA should have the final determination of what schedule is appropriate.

The document should clearly define whether IROLs are a subset of SOLs (or the converse). Should IROLs be coordinated among Reliability Authorities?

The NYISO supports the consensus comments submitted by the ISO/RTO group.

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SAR Commenter Information (For Individual Commenters)

Name

Organization

Industry Segment #

Telephone

E-mail

Key to Industry Segment #'s:

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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: Duke Power SAR 600 Comment Drafting Team	Group Representative: Tom Pruitt, Facilitator Representative Phone: (704) 382-3658 Representative Email: tvpruitt@duke-energy.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Tom Pruitt</i>	<i>Duke Power</i>	<i>1</i>
<i>Don Reichenbach</i>	<i>Duke Power</i>	<i>1</i>
<i>Bob Pierce</i>	<i>Duke Power</i>	<i>1</i>
<i>Chris Schaeffer</i>	<i>Duke Power</i>	<i>5</i>

Background Information:

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- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

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General Philosophy:

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Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

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Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

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The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Overall, the revised standard is now more confusing than the first draft. Section 603 is very difficult to understand. In attempting to clarify how to apply the I.A standard contingency table in version 1, it is now unclear as to what contingencies should be considered in which horizon (operating vs. planning) and what operating actions are allowable to prevent exceeding of operating limits.

This section does not clearly differentiate between various time horizons (e.g., real time, next day, operational planning (up to 18 mos., usually), and long term planning (greater than 18 mos.)). The distinctions made do not clearly map to the time frames currently known and used.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes, **but in the proper time frame.**

No

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comment: We believe there may be other regions with differences, but the current version is not clear enough to determine if more stringent requirements would be necessary in this region or others.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

The 603 section on regional differences that allows NPCC’s alternative methodology speaks to transfer capability under normal and emergency conditions. It is unclear as to when each condition, normal or emergency, applies and how system operation would be affected. The titles Normal & Emergency "Transfer Capability" are in themselves confusing because the non-NPCC requirements don't use the term "Transfer Capability". What is the reason for the different nomenclature? All this once again points out that allowing for regional differences will create different market conditions that should be evaluated by a joint NAESB/NERC effort. i.e. A point to point reservation in NPCC may be denied because of an N-2 condition. A marketer normally operating in SERC would only expect to be denied for N-1 conditions. The bottom line is: The restrictiveness of each region’s reliability standards will ultimately determine the openness of their market.

There needs to be some level of consistency as to methods (which margins are applied and how are they applied). The effort to be non-prescriptive will result in gaming or the appearance of it.

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comment: Generation owners/operators may also play a role in setting these limits (see example in comments to 6 below).

- 6. Please enter any other comments you have regarding this standard in the space below.**

- a. There is some confusion between what constitutes a facility rating versus an operating limit in some cases, such as generator reactive capability and Nuclear Switchyard voltage Limits.
- i. The reactive capability or rating of a generator is typically considered to be the limit based on the machine D curve or capability curve. However, the generator bus voltage or auxiliary bus voltage may limit the reactive capability of a particular generator for certain system or operating conditions. Unless the reactive limit in VARs is a single value (which it usually is not), this is normally referred to as an operating limit. However, classifying such a limit as the reactive power “facility rating” for the generator seems to be what this standard requires. Is this true? The standard seems open for interpretation on this point, so shouldn’t this be clarified?
- ii. It's not clear if items such as Nuclear Switchyard Voltage operating limits should be documented as a "Facility Rating", which the generator would specify and section 603 requires the TO to not violate. Another question is

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

how should potential changes to these limits be facilitated?

Assuming the nuclear switchyard voltage limits would be specified as a Facility Rating, should this standard require the TO to notify the nuclear operators if their contingency studies indicate the voltage could be degraded below the required minimums under certain contingencies so the plants may evaluate if they must take some compensatory actions, such as entering a Tech Spec required Limiting Condition for Operations, etc?

- b. Section 601 and 602 - A generation owner/operator will not necessarily know which of their equipment ratings are significant to grid reliability and we would not want to develop a methodology and associated rating documentation for the rating of every piece of plant equipment. Should this standard either specify, or require the associated RA, PA, TP/TO to specify, what generation ratings are significant to their studies and thus must be documented?
- c. We are concerned that the standard as written may not reflect the latest revision of the Functional Model. In the “Applicability” section, it references a specific version of the functional model - probably should reference the current version of the functional model (FM) since it will likely change.
- d. How does one map between the entities in the FM (authorities) to the current state entities (control areas, etc). If the standard applies to the existing entities but the standard references FM entities, we will all get confused in attempting to implement this standard – this problem needs to be addressed for all standards.
- e. Section 605.a.3.v has a generic statement about applying "reliability margins" to the calculation of transfer capability. This statement is too nebulous and will allow for all kinds of inconsistency as to how/what margins are applied. This effort to be non-prescriptive will result in gaming of markets or at least the appearance that it is occurring.
- f. Does this standard have any dependencies to other standards? Do other standards have to be in place before this one could be implemented? For example, in sections 605/606 - How are these transfer limits posted for implementation? How are these limits implemented in the real time and changed based on current system? The answer will be in the Operate Within Limits Standard (200) - clearly a dependencies description is important for these standards.

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If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
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Regulatory or other Govt. Entities

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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>Tennessee Valley Authority</i>		Group Representative:
		Representative Phone:
		Representative Email:
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

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- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

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- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
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General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments (TVA agrees with the SERC Planning Standard Subcommittee). This whole section is unclear on the difference between planning and operating studies. Is this section specifically dealing with operational horizon (less than 18 months) Next-Day (day ahead planning) and Real-time (operating) studies? Does this section have anything to do with planning horizon (18 months and out) studies or is that still being handled by the existing NERC Planning Standards (Table I.A. and associated measures) or a future standard (Assess Transmission Future Needs and Develop Transmission Plans). The contingencies seem to follow existing Category A, B, and C descriptions, but it's not clear what 603(a)(3)(i)(B-C) "planning purposes" vs. "operations" is saying and what studies the headers for 603(a)(3)(iii-iv) are referencing "on the planned system" vs. "operations studies only".

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments (TVA agrees with the SERC Planning Standard Subcommittee). This should be a requirement for Planning Horizon SOLs. However, real-time and day-ahead SOLs need only consider the next N-1 contingencies.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments (TVA agree with the SERC Planning Standard Subcommittee).

4. **The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments (TVA agrees with the SERC Planning Standard Subcommittee). In the drafting team’s response to comments on Draft-1 they stated on numerous occasions that “the NERC requirement is intended as a minimum and regions have the right to use more stringent requirements if they choose.” However, this **intent** is not stated anywhere in Standard 600. We feel strongly that this intent needs to be included in the document. The following should be added on page 1 of the standard to make it clear that it applies to the entire standard: ***“The level of performance specified is a minimum and more stringent criteria for individual transmission providers or regions are permissible.”***

Many of the Transmission Providers in SERC plan beyond N-1 criteria. The PSS feels that adherence to 603 as written without this wording will result in reduced reliability in SERC.

5. **Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments (TVA agrees with the SERC Planning Standard Subcommittee).

6. **Please enter any other comments you have regarding this standard in the space below.**

Comments (TVA agrees with the SERC Planning Standard Subcommittee).

1. Section 603 (a) (4) (v): References listed at end of sentence need to be updated to the new format.

2. Section 603 (c) (1) (ii): What constitutes Emergency Transfer Capability system conditions?

3. Section 604 (b) (2) and (3): Paragraphs are confusing as to what SOLs are addressed. Suggest paragraph (2) address operating horizon and paragraph (3) address planning horizon.

4. Section 604 (d) (1): The Transmission Planner function should be included annual verification process of the Compliance Monitoring Process.

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SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
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1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments: The proposed language does not make this point clear.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments: The drafting team adequately addressed Mirant's comments. Thank you.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments These functions play a role in that they provide information that the RA may use in the setting of SOLs.

6. Please enter any other comments you have regarding this standard in the space below.

Comments: Still have a few concerns:

1. Section 602 (e), items 1,2 and 4. The last sentence of all three items reads "...in accordance with their respective schedules." Would like to see this modified to read, "in accordance with their respective duly noticed and publicly available schedules." This request is made to acknowledge that there is a two-sided responsibility here. The TO and GO have a responsibility to provide Facility Ratings. However, the RA, PA, TP, and TOP have a responsibility to clearly identify what information it requires and to allow sufficient lead-time for the TO and GO to provide it. If this is not done, the TO and GO should not be subject to sanctions under items 1,2 or 4.
2. Section 605 (a): This section deals with the calculation of TTC which is a core reliability issue. The standard should be tighter, more defined so that consistency is achieved within and across the interconnections regarding the calculation of transfer capability. This is consistent with direction from the NERC Board at its February 20, 2002 meeting. Sub-item (v) looks a lot like TRM of today. As described within the proposed standard, the responsible entities are allowed too much flexibility to come away with a uniform standard for the calculation of TTC. This issue should be given further consideration, especially post 8/14/03, prior to ballot.

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SAR Commenter Information (For Individual Commenters)

Name Tom Mielnik
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Industry Segment # 3
Telephone 563-333-8129
E-mail tcmielnik@midamerican.com

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- 1 – Trans. Owners
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Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments All system operating limits should be checked for instability, cascading and separation for "Level C" contingencies and adjusted to avoid these conditions. This is not the same as establishing limits based upon full consideration of Level C contingencies but provides an important reliability margin.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments In today’s open access environment, Planning Authorities and Transmission Planners must use the same study criteria and methodology in planning the system as the Reliability Authority and Transmission Operators use in operating the system.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments This standard and Standard 200 should be coordinated with each other. If the concept of an IROL is adopted and defined, then IROLs should be defined and addressed within this standard.

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Note — This form is to be used to comment on version 2 of the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard.

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Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

Name	Gerald Rheault
Organization	Manitoba Hydro
Industry Segment #	1,3,5,6
Telephone	204-487-5423
E-mail	gnrheault@hydro.mb.ca

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative:	
	Representative Phone:	
	Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Doug Chapman</i>	<i>Manitoba Hydro</i>	<i>1</i>
<i>Robert Coish</i>	<i>Manitoba Hydro</i>	<i>1</i>
<i>Ron Mazur</i>	<i>Manitoba Hydro</i>	<i>1</i>
<i>David Jacobson</i>	<i>Manitoba Hydro</i>	<i>1</i>
<i>Gerald Rheault</i>	<i>Manitoba Hydro</i>	<i>1</i>

Background Information:

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The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
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- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

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603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

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The “Operate Within IROL” standard will be balloted in December.

- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments While it is clear in standard 603 that system adjustments or reconfigurations may be necessary to prepare for the next contingency (i.e. 603 (3) (iii) (A) (g)), there are several aspects that are not clear. What is the permissible readjustment period (e.g. 30 minutes or several months as in your 345 kV transformer example)? In 603 (3) (iv), is the subsequent contingency within the readjustment period (i.e. within 30 minutes of the first contingency) or following all necessary system readjustments? You mention above that load shedding and/or system reconfiguration will not be permitted for a first contingency and yet in 603 (3) (iii) (A) (f), system adjustment or reconfiguration is permitted for a single contingency. Please clarify exactly what adjustments or reconfigurations are permissible (e.g. spinning and non-spinning operating reserve, capacitor/reactor switching, load tap changers, phase shifters, HVdc converters, generator rejection, transmission reconfiguration, non-firm load shed). A definition for “post contingency time frame” should be provided as part of the definitions. Also what is meant by “applicable post contingency limits”

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments All system operating limits should be checked for instability, cascading and separation for “Level C” contingencies and adjusted to avoid these conditions. This is not the same as establishing limits based on full consideration of level C contingencies but provides an important reliability margin in stability limited systems. A statement to this effect should be added to 603.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

No

Comments . Manitoba Hydro believes that the MAPP Region develops its operating limits using a methodology consistent with Standard 603 with variation as defined in 2 above. We do not require a Regional Difference to plan and operate the regional interconnected network reliably if a statement addressing question 2 is added to the Standard. .

The rationale NPCC has for its regional difference is not clear – the requirements should be consistent with the system design, but it is unclear what value is added in the calculation of limits from consideration of level D contingencies

Manitoba Hydro does not possess adequate information to address the need for Regional Differences in other regions than MAPP.

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments Manitoba Hydro’s comments for the first posting of this Standard have been addressed.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments Manitoba Hydro believes that the Planning Authorities and Transmission Planners play a role in the development of system operating limits(SOL)s. However there is a disconnect in the methodology to establish the planning and operating SOLs for system intact conditions. The planners use level C contingencies to establish planning level SOLs. The operators use level B contingencies and would check level C for cascading, instability and uncontrolled separation to establish their SOLs. As written in this Standard, it could be said that there is no reason to plan beyond the same criteria for transfer capability purposes. The group developing the planning standard may have to address this issue and this standard, in turn, may have to be re-examined.

Planning time frame SOLs developed using the methodology in this Standard should be safe since level C contingencies would be checked for cascading, stability, and uncontrolled separation. In the operating time frame, for a rare fully system intact situation, there would be an inconsistency in that the operating limits would be higher than the planning limits which were developed with full consideration of category C contingencies. For this situation should these limits be dropped for system intact conditions to respect category C or should the operators be allowed to take advantage of the fat in the system intact situation.

6. Please enter any other comments you have regarding this standard in the space below.

- Comments This version is much clearer than previous versions – but this clarity highlights an inconsistency for system intact evaluations in the planning time frame.
- The Performance-reset Period definition is not compatible with the context in which it is used in the standard. For example, in 601 (d) (3), the performance-reset is the time since the last non-compliance which is different than what is said in the definition. The definition in 601 (d) is the correct one.
- It is not clear how the development of each methodology and schedules by multiple parties is to be coordinated. Who has authority to resolve disputes?
- In item 603 (a)(4)(v) there is a mistake in the numbers referenced in conditions listed at end of sentence. Item 603.1.4.1 – 1.4.4 should be 603(a)(4)(i) – (a)(4)(iv).

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Name

Organization

Industry Segment #

Telephone

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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>CenterPoint Energy</i>	Group Representative: <i>Don Chandler</i> Representative Phone: 713-207-2785 Representative Email: don.chandler@centerpointenergy.com	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Paul Rocha</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>John Jonte</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>Richard Sikes</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>Dennis Caufield</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>Wayne Kemper</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>James Hayes</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>Glenn Hemperley</i>	<i>CenterPoint Energy</i>	<i>1</i>
<i>Brad Calhoun</i>	<i>CenterPoint Energy</i>	<i>1</i>

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The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

The question asks if it is clear that “system limits may have to be adjusted during long term outages”. Yes, this is clear. In fact, 603(a)(3)(iii)(A)(f) clearly allows for system reconfiguration following a first contingency: “System adjustment or reconfiguration is permitted...”.

The question also asks if it is clear that “. . . load shedding and/or system reconfiguration will not be permitted for a first contingency . . .”, except for radially connected loads. This is less clear. Regarding load shedding: load shedding (other than radially connected or directly impacted loads) is not permitted in 603(a)(3)(iii)(A)(e) for a Category B (single contingency) condition. Additionally, this is consistent with the Planning Standard. However, as noted above, system reconfiguration is permitted by 603(a)(3)(iii)(A)(f) following a first contingency.

However, the question, coupled with the conclusion of the provided example, seems to imply that load shedding would not be permitted for a condition that qualifies as Category C (double contingency) from a planning perspective. It is not clear that such actions would be prohibited. In fact, **such a conclusion is an inappropriate interpretation of Requirement 603 in that it restricts load shedding for any subsequent contingency after a first contingency** (an n-2 or Category C condition). This conclusion is also inconsistent with 603(a)(3)(iv)(A)(f) that permits interruptions after subsequent contingencies. The Planning Standard permits load shedding for this set of circumstances. A system designed to the Planning Standard may need to shed some load (not limited to radially connected load) for the next (n-2) contingency. The operator may not have another operating option other than load shedding because no other option was designed into the system for this set of circumstances. It is unreasonable to prohibit an operating action that was contemplated in the design of the system for the specified set of circumstances.

For this same reason, the permission, but not the requirement, of system reconfiguration following a first contingency that seems to be allowed in 603(a)(3)(iii)(A)(f) is appropriate and should remain in the standard.

Further, the question refers to “long term outages” but the proposed Standard does not have a comparable reference. What may constitute “long term” is somewhat subjective and could reasonably mean different time frames in different circumstances. Requirement 603 does not specify any time frame or circumstance after which an n-1 condition becomes a new n-0 condition.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

It is unrealistic to require the same level of contingency screening in the operating environment as is required in the planning environment. In the operating environment, system conditions are more dynamic and time horizons are much shorter than in the planning environment. Therefore, it is feasible to perform more robust analysis in the planning environment than in the operating environment.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

See comments to question 1 as an example. The system should be operated the way it is designed (i.e., planned) to operate.

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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>Alberta Electric System Operator</i>	Group Representative: <i>Pamela Mclean</i>	
	Representative Phone: (403)-705-5222	
	Representative Email: Pamela.mclean@aeso.ca	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Pamela Mclean</i>	<i>AESO</i>	<i>2</i>

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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

• Comments .

- The AESO supports the comments made by to this point by the Standards Review Committee of the iSO/RTO Council
- Standard rating practices should be identified to provide consistent methodologies for determining ratings, security limits or transfer capabilities. 601 appears to be watered down from the existing NERC std. There is no wording requiring that rating methodologies be based on "good industry practice" or follow applicable industry standards. No requirement for seasonal ratings or emergency ratings. 601 places no minimums on the quality of the rating methodology to ensure certainty of risk.

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

• Comments

- The AESO supports the comments made by to this point by the Standards Review Committee of the iSO/RTO Council
- Level C contingencies are required within WECC, but that requirement can be handled by a regional difference.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

- Comments:
 - The AESO supports the WEcomments made by to this point by the Standards Review Committee of the iSO/RTO Council

One advantage of including Regional Differences even when they are more stringent than the

4.

5.

6. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

7. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

8. Please enter any other comments you have regarding this standard in the space below.

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If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
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SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group:	Group Representative:	
	Representative Phone:	
	Representative Email:	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #

Background Information:

Notes to Industry Commenters:

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- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
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- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
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- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

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Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments The issue was clear only by providing the example in the above question. Clearer language in the standard would be appropriate.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

X Yes

No

Comments The SOL should be determined at the first contingency level, but this SOL would be 'valid' only if cascading, instability or uncontrolled separation does not occur with the loss of a second facility (before adjustment) when the interface/flowgate is operating at the SOL level.

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

X No

Comments Despite the inclusion of NPCC's more stringent requirements applicable in NPCC, a regional difference at the NERC level should only be used to substitute a less stringent standard or a different standard to be applied for a particular Region. A region can always requires its members to perform to a level higher than the NERC minimum standards through Regional processes.

- 4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.**

Comments

- 5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?**

Yes

No

Comments Planning Authorities and transmission planners would/should have the responsibility to determine the SOLs for time periods beyond the responsibility of the Reliability Authorities. The SOLs determined by the planning functions would be inputs for the RA to determine the real-time SOLs for the current system conditions.

- 6. Please enter any other comments you have regarding this standard in the space below.**

Comments The term ‘some’ is not appropriate to use in the levels of non-compliance in for standards 602, 604, and 606. Whether one entity supplied 2% of the information or 99% of the information, they will be only Level 1 non-compliant. Only when 100% of the values are not provided is the level of non-compliance a level 4. To remedy, delete Levels 1 and 2 of non-compliance for each of these standards. Change the Level 4 to the following ““Not all Facilities Ratings (or SOLs or TC; as appropriate) were provided.....”

Standard 606(a)1 requirement 1 is not clear who has the ultimate authority, the PA or the RA. The standard needs to be very clear. I suggest the following: “ The Planning Authority in coordination with the reliability authority shall establish and provide.....”

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SAR Commenter Information (For Individual Commenters)

Name	John Mayhan
Organization	Omaha Public Power District
Industry Segment #	1 - Transmission Owner
Telephone	(402) 552-5173
E-mail	jmayhan@oppd.com

Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
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- 1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.**

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

The standard as currently written could easily be interpreted as saying that any forced outage, regardless of its time duration, places the system in a state where the requirements of Section 603(a)(3)(iv) apply; Section 603(a)(3)(iv) allows both load shedding and system reconfiguration in response to a contingency.

Additionally, even Section 603(a)(3)(iii) allows system reconfiguration in response to a contingency.

The example given in the question implies that a forced outage is to be considered "planned maintenance" at some point in time after its occurrence. If this is true, then the standard should be modified to make this very clear. Additionally, if a forced outage is to be considered "planned maintenance" at some point in time after its occurrence, then at what point in time does this transition occur? The point in time at which this transition occurs needs to be clearly specified; otherwise, confusion and inconsistency in interpretation of the standard will result.

- 2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?**

Yes

No

Comments

- 3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?**

Yes

No

Comments

[Redacted comment area]

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

- Yes
- No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments

The definition of the word "Facility" is not clear enough to determine whether the following would be included in the list of contingencies that must be evaluated:

- A fault, with Normal Clearing, on a bus section, resulting in more than one branch of the transmission network being removed from service
- A fault internal to a circuit breaker, resulting in more than one branch of the transmission network being removed from service.

COMMENTS OF CONSOLIDATED EDISON

1. **Global Change** : Where it says Transmission Planning please replace it with Transmission Planning or Engineering. This change is necessary because some of the Transmission Planning organizations may not be responsible for developing the methodology for ratings. They are normally developed by the Engineering folks and sent to Planning and Operations.

2. **Sanctions** : We need to object to dollar penalties. If NERC disagrees then we should ask another global change stating:

“For the NPCC Region, the sanctions for non-compliance will be in accordance with NPCC criteria and procedures”. According to long outstanding practice in NPCC, fixed dollar penalties are not permitted. The sanction matrix adopted in NPCC is similar to that described on Page 18 under the paragraph titled “Letter” and it has worked very well. We propose that the paragraph titled “Fixed Dollars” and “Dollar per MW” be removed along with the second half of Page 19.

3. **Definitions** : Please provide a rational for how “frequency” ratings are being developed at NERC or at the Regions.

4. System Operating Limits-

- Since the SAR provides for System Operating Limits used by the Transmission Planner and Transmission Owner, does that preserve the use of Thunder Storm Operating Limits in New York?
- In Section 603 iv, Response to Subsequent Contingencies (operating studies only). Does this mean that studies also look at the next contingency, assuming one contingency has already occurred and the system has had time to readjust itself? See item (g)

5. Transfer Capabilities-

- Section 606 (a) Communication of Transfer Capabilities should make it clear that Transfer Capabilities must be communicated to other (adjacent) impacted Reliability Authorities and Transmission Operators, not just the associated Reliability Authorities and Transmission Owners.

Bob Kotecha

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SAR Commenter Information (For Individual Commenters)

Name	Kirit Shah
Organization	Ameren
Industry Segment #	1
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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
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- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602,

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

603,605), the levels of noncompliance are based on the availability of the values *requested by the users* of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally, formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes, with following comments:

1. What is long term? If it is several months, like in example, we agree. If it is anything less than a few days, say a week, we do not agree.
2. Why would system reconfiguration be not allowed, even for a long-term outage?
3. The second paragraph is confusing as it is a long sentence. The sentence may be split to avoid any confusion.

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments 1. If it is "local" why would instability (angular) a problem if it does not result in uncontrolled separation?

2. How is cascading define and how is to be determined?
3. How are "system transfers" defined?

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments As we have commented earlier, this standard includes too many items. We still believe and recommend that, particularly after "lessons learned" from August 14th blackout, Facility Ratings should be separated as a separate standard.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments Does Operation Planning falls under Planning Authority?

6. Please enter any other comments you have regarding this standard in the space below.

Comments

Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

Note — This form is to be used to comment on version 2 of the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard.

Comments will be accepted from December 1, 2003–January 21, 2004.

Please review the draft standard and answer the questions in the yellow boxes. Send completed comment forms to sarcomm@nerc.com

If you have questions, please call Tim Gallagher at 609-452-8060 or send a question to timg@nerc.com

SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
- 3 – LSE's
- 4 – TDU's
- 5 - Generators
- 6 - Brokers, Aggregators, and Marketers
- 7 - Large Electricity End Users
- 8 - Small Electricity Users
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is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i)–(iv).
- In some cases, the levels of non-compliance have been re-ordered or clarified, as suggested by industry commenters.
- In some cases, the compliance monitoring process has been modified or clarified, as suggested by industry commenters.
- Additional definitions have been added in response to industry comments, such as: cascading outage, normal clearing, delayed clearing and performance-reset period.
- The numbering system used in the standard has been revised. Comments received in response to other standards indicated confusion with the previous numbering system.
- Minor clarifications have been made in various locations in response to industry comments, including capitalization of defined terms.

Changes were also made in the standard to conform to the recently approved version 2 of NERC’s Functional Model. Version 2 identified a few new functions, such as Transmission Planner, Generator Owner, and Planning Authority, which are associated with this standard. The drafting team is generally supportive of Version 2 of the Functional Model, but did notice some inappropriate or incomplete task descriptions in it. These deficiencies will be pointed out to the group responsible for the model so that the Model can be corrected. Notably:

- The Model incorrectly assumes that Reliability Authorities will only determine Interconnected Reliability Operating Limits (IROL). In the draft standard, Reliability Authorities are responsible for determining all System Operating Limits (SOL) in their area, not just the subset that are considered IROLs.
- The Model misunderstands the relationship between SOLs and IROLs. IROLs are a subset of SOLs.
- The Model does not recognize the role played by the Planning Authority and Transmission Planner in the determination of SOLs.

General Philosophy:

The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

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The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

For example, if a large 345 kV transformer is damaged and cannot be replaced for several months, the system limits would need to be re-established with the base condition including the transformer outage. Any subsequent outages would be considered n-1 contingencies and must meet the requirements in 603.

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team’s response did not properly respond to your comment, please let us know in the space below.

Comments

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments These comments represent additional comments prepared by Ron Mazur, Manitoba Hydro.

General Comments

1. Each standard should have a “responsible entity” section. The standards use the term “responsible entity” in some cases, and refer to the responsible entities defined in the Functional Model (Reliability Authority (RA), Planning Authority (PA), Transmission Planner (TP), Generator Owner (GO), etc) in other cases. In many cases, responsible entity seems to have the obligation to provide the documentation/data to itself. The SDT should review the use of the Functional Model terminology throughout each standard and clarify the roles and obligations to eliminate the confusion.
2. Further to item 1 above, the measure will assign an obligation for the responsible entity (Transmission Owner (TO) or GO) provide documentation to the RA, PA, TP, Transmission Service Provider (TSP) or Transmission Operator (TOP). The levels of Noncompliance then repeat the list of entities that are to receive the documentation. The Standards could be made more readable by eliminating such unnecessary duplication.
3. Since the standard includes a Compliance Monitoring Process and Levels of Noncompliance, the SDT should also include a section on what is expected for mitigation of non-compliance.
4. The number of levels of bullets (e.g. 605(a)(3)(iii)) makes the standard difficult to read. Other section naming designations should be considered.
5. Each standard should be reviewed to ensure all defined terms are appropriately marked (capitalized when used in the text). Similarly, a statement should be added to indicate that other NERC

definitions are capitalized.

6. I am concerned that the SOLs and Transfer Capabilities defined in these standards for operation will not be determined using the same level of performance (existing NERC Planning Standard I. A. Table I Category B and C) as is used for planning the system.

Definitions

- Where possible NERC Standard definitions should be used. Where used, the NERC definitions should also be capitalized (e.g. Bulk Electric System).
- Delayed Fault Clearing: What is a protection group? The Normal Clearing definition uses “protection system”.
- Facility: An element is normally defined as a group of equipment that is relayed together. Why not used the more common terminology.
- Equipment Rating: Uses the term “equipment apparatus” while the Facility Rating definition uses “equipment”.
- Performance-reset Period: The definition is not compatible with the context in which it is used in the standard. For example, in 601 (d) (3), the performance-reset is the time since the last non-compliance.
- System Operating Limit: All defined terms (Facility(ies), Facility Ratings, System Operating Limits) should be capitalized. Where is the term “reliability criteria” defined?
- Transfer Capability: Capitalize “system operating limits”

Standard 600

- Purpose: The purpose may be more appropriately stated as: “To document methodologies used, and to determine and communicate Facility Ratings, System Operating Limits and Transfer Capabilities of the Bulk Electric System.”
- Purpose: Capitalize bulk electric system.
- Effective Date: What existing Operating Policy(ies) and Planning Standards will these Standards replace on the effective date? Does the SDT have a plan to transition to the new Standards?

Standard 601

- 601 (a) (3): Capitalize bulk electric system.
- 601 (b) (1): Clarify who has responsibility to make the methodology available (TO and GO). While the Compliance Monitor requires the documentation of the rating methodology, is it required by the other entities, and is this proposed obligation consistent with the SAR?

- 601 (b) (2): This measure requires the methodology to contain all items specified in 601 (a) (2) and 601 (a) (3). The wording “as applicable to the responsible entity” should be added, since the TO, for example, would not discuss generator rating methodology.
- 601 (e): The Levels of Noncompliance should include the wording “as applicable to the responsible entity” as noted in the bullet above to allow TO who does not own generation, or a GO who does not own transmission to be compliant.

Standard 602

- 602 (b) (1): Define responsible entities.
- 602 (b) (2): Rather than using a pre-defined schedule, the ratings should be provided whenever they are established or recalculated.
- 602 (d) (3): The impacted parties should be defined and limited to the entities with a verifiable need for the data.
- 602 (e) (3): There is more impact on reliability if ratings are not provided. Providing ratings that are inconsistent with methodology should be the lowest level of noncompliance.

Standard 603

- 603 (a) (1): Define the responsible entities.
- 603 (a) (3): This section of performance criteria should be an attachment that can be referenced by Standard 604 and Standard 606 – it is not part of the methodology.
- 603 (a) (3) (i) A): Use “applicable loading” instead of “thermal” in this section and throughout the standard – why not use the terminology already established in the NERC Planning Standard I. A. and its associated Table I.
- 603 (a) (3) (i) B): This may be possible for new facilities but what were the planned conditions. Can the SDT explain the intent in more detail. Is the objective to ensure that the system is operated to the same standard to which it was planned?
- 603 (a) (3) (ii) A): This contingency section should use the same terminology as was used in the existing Planning Standard Table I. For example, Contingency A) (a) should use the words “For the loss of a single element (Facility is used by the SDT) due to” (a) Single line to ground , as it is not clear as written that an element is loss due to the fault.
- 603 (a) (3) (iii): Similar to the bullet above, replace “Response to the first contingency” with “Response to the loss of a single element”.
- 603 (a) (3) (iii) (a): Use “applicable loadings” instead of “thermal”.
- 603 (a) (3) (iii) (e): Define “affected area” – Can the SDT provide criteria to define an “adverse impact”?
- 603 (a) (3) (iii) (f): What “system adjustments are allowed? Is generator tripping allowed for following the loss a single Facility?
- 603 (a) (3) (iii) (g): Does a system adjustment allow curtailment of firm transfers as is specified in Table I notes of the existing NERC Planning Standards. Such reliability curtailment would have to be done outside of the pro-forma tariff which requires pro-rata load curtailment with firm transfer curtailment, since loss of load

is not permitted for a single credible contingency.

- 603 (a) (3) (iv) (a): Use “loadings” instead of “thermal”.
- 603 (a) (3) (iv) (e): Define: affected area”.
- 603 (a) (3) (iv) (f)/(g): Can firm transfers be interrupted as well as load? Why is load interruption allowed for a single (NERC Table I Cat B) event? This represents an unacceptable degradation in performance criteria.
- 603 (a) (4) (ii): Can the SDT explain what is required to deal with model accuracy? Benchmarking, sensitivity analysis to load level, load power factor, etc?
- 603 (a) (4) (v): Reference appears to be incorrect.
- 603 (a) (4) (b) (i): Should the transmission Service Provider (TSP) be included in the list of those receiving the methodology (see 604(a) (2) – TSP receives data).
- 603 (a) (4) (c): The regional difference is requiring that SOLs be determined by considering some of the Category C contingencies from Table I of the existing I. A. What is the SDT’s argument for setting SOLs using a lesser standard?
- 603 (a) (4) (d) (2): Define responsible entities.

Standard 604

- 604 (a): Clarify/confirm the responsible entities. It appears that PAs provide SOLs to PAs (to themselves?) for the area they are responsible.
- Section 604 should contain the performance criteria in Section 603 (a) (3), or reference it as the performance criteria used to establish the SOLs.
- 604 (b) (2) & (3): Should the obligation to provide data be on a schedule, or as it becomes available?
- 604 (d) (2): Reword the phrase “the Compliance Monitor shall verify by information submittal” – the responsible entity will be the one providing the information (not the CM).
- 604 (d) (3): Define “impacted party”.

Standard 605

- 605 (a) (3) (iv): Can the SDT explain what they expect to see in a discussion of “Current and projected transmission uses”?
- 605 (a) (3) (v): Why is uncertainty only limited to 605 (a) (3) (i) – system topology?
- 605 (b) (i): Clarify who the responsible entities are (again the RA makes the methodology available to the RA).
- 605 (d) (1) (iii): Clarify the nature of the compliant and who can make the compliant.

Standard 606

- 606 (a): What performance criteria are to be used to establish Transfer Capabilities? A reference is required to Standard 603 (a) (3), or preferably, the section should be an Appendix common to Standards 604 and 606.
- 606 (b) (1) and (2): Define the responsible entities. Also, I believe that the obligation to communicate data should be tied to whenever the

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transfer capabilities are calculated or recalculated, instead of on a pre-determined schedule, or perhaps in addition to a schedule.

- 606 (d) (2) Clarify who is to provide the information submittal – it is not the CM.
- 606 (e): Since the measures in 606 (b) define the entities that are to receive the data, readability of the standard(s) would be enhanced if the information were not repeated in the Levels of Noncompliance.

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SAR Commenter Information (For Individual Commenters)

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Key to Industry Segment #'s:

- 1 – Trans. Owners
- 2 – RTO's, ISO's, RRC's
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- 4 – TDU's
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Comment Form — 2nd Posting of the draft ‘Determine Facility Ratings, System Operating Limits, and Transfer Capabilities’ Standard

SAR Commenter Information (For Groups Submitting Group Comments)		
Name of Group: <i>WECC Technical Studies Subcommittee</i>	Group Representative: <i>Peter Mackin</i> Representative Phone: 916-631-3200 Representative Email: <i>pmackin@navigantconsulting.com</i>	
List of Group Participants that Support These Comments:		
Name	Company	Industry Segment #
<i>Peter Mackin</i>	<i>Transmission Agency of Northern California</i>	<i>1</i>
<i>John Collins</i>	<i>Platte River Power Authority</i>	<i>1</i>
<i>Jay Seitz</i>	<i>US Department of Interior Bureau of Reclamation</i>	<i>4</i>
<i>Chuck Russell</i>	<i>Salt River Project</i>	<i>1</i>
<i>Craig Quist</i>	<i>PacifiCorp</i>	<i>1</i>
<i>Peter Krzykos</i>	<i>Arizona Public Service Company</i>	<i>1</i>
<i>C.V. Chung</i>	<i>Seattle City Light</i>	<i>4</i>
<i>David Barajas</i>	<i>Imperial Irrigation District</i>	<i>1</i>
<i>Vance Crocker</i>	<i>Black Hills Power</i>	<i>1</i>
<i>Mathew Stoltz</i>	<i>Basin Electric Power Cooperative</i>	<i>1</i>
<i>Kenneth Dillon</i>	<i>Portland General Electric Company</i>	<i>1</i>
<i>Mark Hanson</i>	<i>Idaho Power Company</i>	<i>1</i>
<i>Chuck Stigers</i>	<i>NorthWestern Energy</i>	<i>1</i>
<i>Abbas Abed</i>	<i>San Diego Gas and Electric Company</i>	<i>1</i>
<i>Joe Seabrook</i>	<i>Puget Sound Energy</i>	<i>1, 3</i>
<i>Milt Percival</i>	<i>Western Area Power Administration - DSW</i>	<i>1</i>
<i>Tom Green</i>	<i>Public Service Company of Colorado</i>	<i>1</i>
<i>Dana Cabbell</i>	<i>Southern California Edison Company</i>	<i>1</i>
<i>Joe Tarantino</i>	<i>Sierra Pacific Power Company</i>	<i>1</i>
<i>Ben Morris</i>	<i>Pacific Gas and Electric Company</i>	<i>1</i>
<i>Phil Park</i>	<i>British Columbia Transmission Corporation</i>	<i>1</i>

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<i>Gary DeShazo</i>	<i>CAISO</i>	<i>2</i>
<i>Pamela Johnson</i>	<i>Southwest Transmission Cooperative, Inc.</i>	<i>1</i>
<i>John D. Martinsen</i>	<i>Snohomish County Public Utility District</i>	<i>4</i>
<i>Mary Ann Tilford</i>	<i>Tucson Electric Power</i>	<i>1</i>
<i>Pamela Mclean</i>	<i>Alberta Electric System Operator</i>	<i>2</i>

Background Information:

Notes to Industry Commenters:

The standard drafting team (SDT) considered the SAR for this proposed standard as well as the SAR comments and comments in response to version 1 of this standard while developing version 2 of the standard. The SDT believes that it is helpful for the industry to understand the perspective of the SDT while reviewing this draft standard. The SDT also believes that it would be helpful to explain the linkages with other standards currently under development. The explanations below are offered to provide context and facilitate industry comments.

What has changed from Version 1 to Version 2?

The drafting team is most appreciative of all those who submitted comments in response to the first posted version of this standard. These comments were used as the basis for revisions to the standard that is now posted for a second round of industry review. Highlights of the changes made in response to industry comments:

- The table of expected performance used when determining System Operating Limits (Section 603) has been replaced with text in order to add greater clarity (Subsections 603(a)(3)(i) - (iv).
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The SDT addressed the three components of this draft standard in three sets of pairs: Facility Ratings (601, 602), System Operating Limits (603, 604), and Transfer Capabilities (605,606). In each of these pairs, the draft standard requires the development and availability of a “methodology” to determine the required quantities and secondly the application of this methodology in the establishment and communication of these values to the users of the values. These standards were developed assuming that the Facility Ratings, System Operating Limits and Transfer Capability values are to be provided to the user (e.g. those entities performing the reliability authority, planning authority, and transmission operator functions) on a schedule established by the *user*. The SDT endeavored to ensure that this draft standard would not require the determination of various values that had no identified user. For this reason, the user of the various values must request the specific values from the value provider (e.g. those entities performing the facility owner and planning authority functions) through the establishment of a schedule to supply the data.

Levels of Noncompliance:

In the three ‘methodologies’ sections (601, 603, 605), the levels of noncompliance are based upon the availability and completeness of the documented procedures. In the three ‘communication’ sections (602, 603,605), the levels of noncompliance are based on the availability of the values requested by the users of the information and the consistency of these values with the documented methodologies.

Sanctions:

The SDT believes that failure to comply with the three ‘methodologies’ sections (601, 603, 605) does not warrant monetary sanctions, since the methodologies themselves would not *directly* impact the ability to operate the transmission system. However the SDT feels that the issuance of Letters of Non-compliance to various officer level persons and oversight bodies will provide sufficient encouragement to promote compliance.

The unavailability of Facility Rating *values*, System Operating Limit *values* and to a lesser extent, Transfer Capability *values* will have a real and detrimental impact on the real time reliability of the transmission system as well as the validity of transmission plans for future transmission system additions. Therefore, the three ‘communication’ sections (602, 604, 606) include monetary sanctions for repeated and/or significant noncompliance as per the sanction table. The SDT believes that nominal, fixed dollar sanctions are appropriate in these cases. The application of ‘per MW’ variable sanctions would be inappropriate for these infractions compared to the consequences of violating the requirements of the standard. While the SDT realizes that a minor omission of a requested value could result in sanction, the SDT also believes that graduated sanctions based upon the level of ‘completeness’ of the data received by the users are impractical. The SDT is of the opinion that not all values have equal importance to the reliability of the transmission system, and therefore, sanctions based upon ‘percentage of requested data received’ (perhaps omitting values of specific critical limitations) would be arbitrary. Additionally,

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formulating levels to include completeness and importance would result in a cumbersome and complex matrix in itself.

Relationship with “Operate Within Interconnected Reliability Operating Limits” Standard:

The SDT suggests that this draft standard be reviewed in concert with the “Operate Within IROL” draft standard. The Facility Ratings, System Operating Limits, and Transfer Capabilities draft standard requires the availability and usability of these data. The Operate Within Limits standard addresses the use of a subset of these values in real time operation. The SDT believes that the definitions developed in conjunction with this standard do not prohibit the stratification, or sub-classification, of the requested data (Facility Ratings, System Operating Limits, Transfer Capabilities) for specific uses or users. The intent and purpose of this standard, however, is to identify *all* system operating limits and not to differentiate them based upon the impacts of violating them.

The “Operate Within IROL” standard will be balloted in December.

1. Requirement 603 has been rewritten to clarify and amplify the material contained in the table present in the earlier version of this draft standard. The underlying requirements in that table were not modified.

Is it clear that system limits may have to be adjusted during long term outages to reflect the requirement that load shedding and/or system reconfiguration will not be permitted for a first contingency on any generator, transmission circuit or transformer except when such an element is part of a single circuit radial connection?

Yes

No

Comments

2. Do you see a need for contingencies known in the current NERC Planning Standards as "Level C contingencies", such as breaker failure, double circuit loss and bipole block, to be examined to ensure that system cascading, instability and uncontrolled separation do not result at system transfers consistent with the limits developed using this methodology?

Yes

No

Comments The WECC TSS feels that these contingencies should be examined as is the current practice in WECC. However, this additional level of analysis can be implemented as a Regional Standard specific to WECC.

3. NPCC has requested a Regional Difference in this section. Are there any other Regions who require a Difference, in light of the revisions to this section?

Yes

No

Comments *WECC is requesting a "Regional Difference" as shown in the attached file.*

4. The drafting team made every effort to respond to industry comments received during the first posting of this proposed standard. The standard was modified in response to these comments in many cases. If the team's response did not properly respond to your comment, please let us know in the space below.

Comments The WECC TSS believes that all of its previous comments were adequately addressed.

5. Do you agree with that Planning Authorities and Transmission Planners play a role in the development of System Operating Limits?

Yes

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No

Comments

6. Please enter any other comments you have regarding this standard in the space below.

Comments The WECC TSS would like to complement the SDT on this revised draft standard. It is obvious that a great deal of effort has been expended in developing the draft and in responding to industry comments.

We have some additional minor comments on Draft 2:

(1) Some of our reviewers are not sure why the definition for “Cascading Outages” was changed to exclude the second sentence, “Cascading results in widespread electric service interruption, which cannot be restrained from sequentially spreading beyond an area predetermined by appropriate studies”. This second sentence would clarify the extent of the outages and should be included.

(2) Some of our reviewers were confused by the definition of Facility. It might be helpful to also define Equipment. This additional definition would help clarify the Facility definition. A draft definition for Equipment is provided below:

Equipment: A single piece of electrical apparatus that can comprise a portion of a Facility and that has ratings that may limit the capability of the Facility of which the electrical apparatus is a part. Examples of Equipment include: disconnect switches, circuit breakers, generator excitation systems, line voltage regulators, and line conductors.

(3) We are confused about the use of the “minimum” values in the definition of SOL, since, depending on the specific value referenced, these terms may not be applicable. (For example, what would a minimum current limit apply to?) We understand that the definition must be broad enough to cover limits that are set based on parameters other than MW or MVAR flows. Perhaps rewording the definition by separating it into two parts and some examples may help.

(4) Standard 200 refers to the Interconnection Reliability Operating Limit (IROL) as a subset of SOLs and only would enforce that subset of limits. Standard 600 does not refer to IROLs or explain/identify the requirement for documenting the methodology and developing these specific limits, unless it is implied in 603 and 604. 600 and 200 need to be linked.

(5) 601(a)(3) is a long sentence. We suggest rewording for readability, as follows:

“The methodology required in 601(a)(1) shall identify the assumptions used to determine Facility Ratings, including:

- the method by which ratings of major bulk electric system equipment types that

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comprise the Facilities* are determined and

- references to industry rating practices or other standards (e.g., IEEE, ANSI, CSA), when applied.

*Facilities for which rating methodologies are required include, but are not limited to,

- generators,
- transmission lines,
- transformers,
- terminal equipment, and
- series and shunt compensation devices”

(6) Section 601(d)(2) allows entities one year to get in compliance after adoption of the Standard. This is a very tight time frame and significant reporting burden; after all it generally takes longer than a year to just write a standard. We suggest a longer time frame for entities to initially comply. Similar comment for 603(d)(2) and 605(d)(2).

(7) 601(e) Levels of noncompliance. Suggest adding words on all levels to the effect that the non-compliance levels do not address non-*applicable* items. We have seen confusion on noncompliance levels where missing items would determine noncompliance when some of the items listed may not be applicable to all entities

(8) Section 602(b)(1) states: “Responsible entities shall establish their Facility Ratings consistent with their ratings methodology, described in 601(a).” Section 601(a) does not describe any ratings methodology, it cites the requirement for a methodology. We suggest a little wordsmithing, rewriting the sentence to read: “Responsible entities shall establish their Facility Ratings consistent with their ratings methodology required by 601(a).”

(9) Section 602(d): Once this standard is approved, it does not seem reasonable to expect entities to have ratings for all facilities completed immediately. There should be a reasonable period of time to allow organizations to complete facility ratings. We suggest a three-year period.

(10) Levels of noncompliance in section 602(e) are cumbersome. Identify whether “some” ratings were not provided would also require considerable tracking of rating information.

(11) The references to 603.1.4.4-603.1.4.4 in 603(a)(4)(iv) on page 8 should probably be changed to 603(a)(4)(i)-603(a)(4)(iv).

(12) Please move the last sentence in section 603(a)(3)(i)(A), “Curtailed load or transfers is not required to maintain the system within the System Operating Limits”, to section 603(a)(3)(i)(B). This change would remove the potential conflict between 603(a)(3)(i)(A) and 603(a)(3)(i)(C) and allow the operators the flexibility to curtail transmission service if deemed necessary to accommodate planned maintenance.

(13) In section 603(a)(3)(ii) requires the evaluation of “(a) Single line to ground or 3-phase fault, with Normal Clearing, on *any* faulted Facility”. The previous draft showed a Table I, which specifies “single line to ground or 3-phase fault, with normal clearing on, Generator, Transmission Circuit, or Transformer”. Since “any Facility” includes more than those specified in Table I, for example, faults on bus sections, this draft appears to be more stringent than the previous version. Please replace “any faulted Facility” with “any faulted Generator, Transmission Circuit, or Transformer”.

(14) Please replace 603(a)(3)(iv)(e) with footnote d from Table I. Footnote d states:

“Depending on system design and expected system impacts, the controlled interruption of electric supply to Customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of

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the interconnected transmission systems.”

Footnote (d) applies to Category C contingencies (N-1-1), which is more in line with operating studies.

(15) In section 603(a)(3)(iv)(f) and (g), we allow interruption of firm load for operating studies, but make no mention of interruption of contracted firm transfer. This would put contracted firm transfer ahead of firm load. Please change these sections to allow for interrupting "contracted transfer" if needed.

(16) In section 603(c)(1)(i) there is no mention of single line-to-ground faults with normal clearing on a bus section or a circuit breaker (failure or internal fault) as in the previous version of the draft. Was this intentional or was it an oversight?

(17) Section 603(e)(1) might be clearer if a parenthetical reference was made to section 603(a)(2) since that section [603(a)(2)] is also referenced in non-compliance level 3 just below in section 603(e)(3).

(18) Sections 602, 604 and 606 have no requirements for periodic review and update of the ratings established in 602 – Establish and Communicate Facility Ratings, 604 – Establish and Communicate System Operating Limits, and 606 – Establish and Communicate Transfer Capabilities. To assure the ratings are still current and accurate we believe this issue should be addressed by the standard.

(19) In section 605(a)(2) “The methodology required in 605(a)(1) shall state that Transfer Capabilities shall adhere to all applicable System Operating Limits”. Please change “adhere to” to “remain within” because as written, this section could be interpreted as the Transfer Capabilities shall be the same as all applicable System Operating Limits.

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c. Regional Differences

2. The following Regional Difference shall apply only in the Western Electricity Coordinating Council (WECC). The WECC methodology required in 603(a)(1) shall require that System Operating Limits be established for following system conditions, in addition to those listed in 603(a)(3)(i)
 - i. Single Contingencies
 - A) The following single contingencies must be evaluated:
 - a. Single line to ground or 3-phase fault, with Normal Clearing, on any faulted Generator, Transmission Circuit or Transformer.
 - b. Loss of any Facility without a fault.
 - c. Single pole block, with Normal Clearing, in a monopolar or bipolar HVdc system.
 - B) System Operating Limits shall be established such that for contingencies in 603(c)(2)(i)(A) operation within the System Operating Limit shall provide system performance consistent with that prescribed in 603(a)(3)(iii)–603(a)(3)(iv) above.
 - ii. Multiple Contingencies
 - A) In addition to the single Facility contingencies listed in 603(c)(2)(i)(A), the following multiple Facility contingencies must also be evaluated when establishing System Operating Limits:
 - a. Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is an acceptable risk and therefore can be excluded.
 - b. A permanent phase to ground fault on any generator, transmission circuit, transformer, or bus section with Delayed Fault Clearing except for bus sectionalizing breakers or bus-tie breakers addressed in (g) below.
 - c. Simultaneous permanent loss of both poles of a direct current bipolar facility without an AC fault.
 - d. The failure of a circuit breaker associated with a special protection system to operate when required following: the loss of any element without a fault; or a permanent phase to ground fault, with Normal Clearing, on any transmission circuit, transformer or bus section.

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- e. Simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on separate towers in a common right-of-way, with Normal Clearing.
 - f. A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by Standard 603.
 - g. The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground fault.
- B) System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(a)- 603(c)(2)(ii)(d) operation within the System Operating Limit shall provide system performance consistent with the following:
- a. All Facilities are operating within their applicable post-contingency thermal, frequency and voltage limits.
 - b. Cascading outages do not occur.
 - c. Uncontrolled separation of the system does not occur.
 - d. The system demonstrates transient, dynamic and voltage stability.
 - e. Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.
 - f. Interruption of firm transfer, load or system reconfiguration is permitted through manual or automatic control or protection actions.
 - g. To prepare for the next contingency, system adjustments are permitted, including changes to generation, load and the transmission system topology when determining limits.
- C) System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(e) operation within the System Operating Limit shall provide system performance consistent with the following with respect impacts on other systems:
- a. All Facilities are operating within their applicable post-contingency thermal, frequency and voltage limits.
 - b. Cascading outages do not occur.
 - c. Uncontrolled separation of the system does not occur.
 - d. The system demonstrates transient, dynamic and voltage stability.
 - e. Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.

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- f. Interruption of firm transfer, load or system reconfiguration is permitted through manual or automatic control or protection actions.
 - g. To prepare for the next contingency, system adjustments are permitted, including changes to generation, load and the transmission system topology when determining limits.
- D. System Operating Limits shall be established such that for multiple Facility contingencies in 603(c)(2)(ii)(f) – 603(c)(2)(ii)(g) operation within the System Operating Limit shall provide system performance consistent with the following with respect to impacts on other systems:
- a. Cascading outages do not occur.
- E. When planning systems and facilities, WECC may make changes (performance category adjustments) to the contingencies required to be studied and/or the required responses to contingencies based on actual system performance and robust design. Such changes will apply in determining System Operating Limits.