

Implementation Plan for Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standards

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Prerequisite Approvals

There are no other Reliability Standards or Standard Authorization Requests (SARs), in progress or approved, that must be implemented before this set of standards can be implemented.

Retirement of Sections of Version 0 Standards

Many elements contained in the proposed set of Standards address the same or similar performance objectives as sections of Version 0 Standards FAC-004-0, FAC-005-0 and TOP-004-0. To eliminate duplication and minimize confusion, the following Version 0 Requirements and associated Measures should be retired when this set of proposed standards is adopted. Justification for these retirements is provided in the tables on the following pages.

FAC-004-0 Methodologies for Determining Electrical Facility Ratings

- Retire the entire standard coincident with the implementation of FAC-008-1.

FAC-005-0 Electrical Facility Ratings for System Modeling

- Retire the entire standard coincident with the implementation of FAC-009-1.

TOP-004-0 Transmission Security

- Retire the following requirements coincident with the implementation of FAC-011-1:
 - R6.1
 - R6.5

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FAC-004-0	FAC-008-1
<p>1. The Transmission Owner and Generator Owner shall each document the methodology(ies) used to determine its electrical Facility and equipment Rating. Further, the methodology(ies) shall comply with applicable Regional Reliability Organization requirements. The documentation shall address and include</p> <p>1.1. The methodology(ies) used to determine Facility and equipment Rating of the items listed for both normal and emergency conditions:</p> <p>1.1.1. Transmission circuits.</p> <p>1.1.2. Transformers.</p> <p>1.1.3. Series and shunt reactive elements.</p> <p>1.1.4. Terminal equipment (e.g., switches, breakers, current transformers, etc.)</p> <p>1.1.5. VAR compensators.</p> <p>1.1.6. High voltage direct current converters.</p> <p>1.1.7. Any other device listed as a Limiting Element.</p> <p>1.2. The Rating of a facility shall not exceed the Rating(s) of the most Limiting Element(s) in the circuit, including terminal connections and associated equipment.</p> <p>1.3. In cases where protection systems and control settings constitute a loading limit on a facility, this limit shall become the Rating for that facility.</p> <p>1.4. Ratings of jointly-owned and jointly-operated facilities shall be coordinated among the joint owners and joint operators resulting in a single set of Ratings.</p> <p>1.5. The documentation shall identify the assumptions used to determine each of the Facility and equipment Ratings, including references to industry Rating practices and standards (e.g., ANSI, IEEE, etc.). Seasonal Ratings and variations in assumptions shall be included.</p> <p>2. The Transmission Owner and Generator Owner shall provide documentation of the methodology(ies) used to determine its transmission Facility and equipment Ratings to the Regional Reliability Organization(s) and NERC on request (30 calendar days).</p>	<p>R1. The Transmission Owner and Generator Owner shall each document its current methodology used for developing Facility Ratings (Facility Ratings Methodology) of its solely and jointly owned Facilities. The methodology shall include all of the following:</p> <p>R1.1. A statement that a Facility Rating shall equal the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.</p> <p>R1.2. The method by which the Rating (of major BES equipment that comprises a Facility) is determined.</p> <p>R1.2.1 The scope of equipment addressed shall include, but not be limited to, generators, transmission conductors, transformers, relay protective devices, terminal equipment, series and shunt compensation devices.</p> <p>R1.3. Consideration of the following:</p> <p>R1.3.1 Ratings provided by equipment manufacturers.</p> <p>R1.3.2 Design criteria (e.g., including applicable references to industry Rating practices such as manufacturer’s warranty, IEEE, ANSI or other standards).</p> <p>R1.3.3 Ambient conditions.</p> <p>R1.3.4 Operating limitations.</p> <p>R1.3.5 Other assumptions.</p> <p>R2. The Transmission Owner and Generator Owner shall each make its Facility Ratings Methodology available for inspection and technical review by those Reliability Coordinators, Transmission Operators, Transmission Planners and Planning Authorities that have responsibility for the area in which the associated Facilities are located, within 15 business days of receipt of a request.</p> <p>R3. If a Reliability Coordinator, Transmission Operator, Transmission Planner or Planning Authority provides written comments on its technical review of a Transmission Owner’s or Generator Owner’s Facility Ratings Methodology, the Transmission Owner or Generator Owner shall provide a written response to that commenting entity within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Facility Ratings Methodology and, if no change will be made to that Facility Ratings Methodology, the reason why.</p>

Comparison of V0 to V1:

- The scope of equipment addressed has been reduced to eliminate duplication and has been expanded to specifically include generators
- The list or sub-requirements has been reduced to eliminate duplication
- V1 introduces the concept of providing the Facility Ratings Methodology for ‘technical review’. This supports the concept of ‘peer review’ that was requested following the August 2003 Blackout.
- The list of entities that must be provided with the methodology has been expanded to include all the entities that have a reliability-related need to use the Facility Ratings developed with the Facility Ratings Methodology.
- The timeframe for providing the methodology has been shortened.
- V1 introduces peer pressure as a method of encouraging facility owners to be responsive to concerns identified about Facility Ratings Methodologies. This supports the concept of ‘peer review’ that was requested following the August 2003 Blackout.

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FAC-005-0	FAC-009-1
<p>R1. The Transmission Owner, and Generator Owner shall each have on file or be able to readily provide, a document or database identifying the Normal and Emergency Ratings of all of its transmission facilities (e.g., lines, transformers, terminal equipment, and storage devices) that are part of the interconnected transmission systems. Seasonal variations in Ratings shall be included as appropriate.</p> <p>1.1. The Ratings shall be consistent with the entity’s methodology(ies) for determining Facility Ratings and shall be updated as facility changes occur.</p> <p>R2. The Transmission Owner and Generator Owner shall provide the Normal and Emergency Facility Ratings of all its transmission facilities to the Regional Reliability Organization(s) and NERC on request (30 calendar days).</p>	<p>R1. The Transmission Owner and Generator Owner shall each establish Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings Methodology.</p> <p>R2. The Transmission Owner and Generator Owner shall each provide Facility Ratings for its solely and jointly owned Facilities that are existing Facilities, new Facilities, modifications to existing Facilities and re-ratings of existing Facilities to its associated Reliability Coordinator(s), Planning Authority(ies), Transmission Planner(s), and Transmission Operator(s) as scheduled by such requesting entities.</p>
<p>Comparison of V0 to V1:</p> <ul style="list-style-type: none"> – V1 eliminates redundant language. – V1 shifts the focus from providing Facility Ratings to just Regions to providing Facility Ratings to all those entities that have a reliability-related need for those ratings. 	

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TOP-004-0	FAC-011-1
<p>R 6. Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including:</p> <p>R 6.1. Equipment ratings.</p> <p>R 6.21. Monitoring and controlling voltage levels and real and reactive power flows.</p> <p>R 6.32. Switching transmission elements.</p> <p>R 6.43. Planned outages of transmission elements.</p> <p>R 6.5. Development of IROLs and SOLs.</p> <p>R.6.64. Responding to IROL and SOL violations.</p>	<p>R1. The Reliability Coordinator shall ensure that SOLs, including Interconnection Reliability Operating Limits (IROLs), for its Reliability Coordinator Area are established and that the SOLs (including Interconnection Reliability Operating Limits) are consistent with its SOL Methodology.</p> <p>R2. The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology.</p> <p>R5. The Reliability Coordinator, Planning Authority, and Transmission Planner shall each provide its SOLs and IROLs to those entities that have a reliability-related need for those limits and provide a written request that includes a schedule for delivery of those limits as follows:</p> <p>R5.1 The Reliability Coordinator shall provide its SOLs (including the subset of SOLs that are IROLs) to adjacent Reliability Coordinators and Reliability Coordinators who indicate a reliability-related need for those limits, and to the Transmission Operators, Transmission Service Providers and Planning Authorities within its Reliability Coordinator Area. For each IROL, the Reliability Coordinator shall provide the following supporting information:</p> <p>R5.1.1 Identification and status of the associated Facility (or group of Facilities) that is (are) critical to the derivation of the IROL.</p> <p>R5.1.2 The value of the IROL and its associated T_v.</p> <p>R5.1.3 The associated Contingency(ies).</p> <p>R5.1.4 The type of limitation represented by the IROL (e.g., voltage collapse, angular stability).</p> <p>R5.2 The Transmission Operator shall provide any SOLs it developed to its Reliability Coordinator and to the Transmission Service Providers that share its portion of the Reliability Coordinator Area.</p>

Comparison of V0 to V1:

- TOP-004-0_R6.1 requires the TOP to develop policies and procedures that address the execution and coordination of equipment ratings. However, under the Functional Model, the Transmission Owner is not responsible for establishing equipment ratings or for distributing those ratings. The Functional Model clearly assigns responsibility for establishing Facility Ratings to the Facility Owners – and Facility Ratings are derived from equipment ratings. Assuming that R6.1 is requiring the sharing of these ratings, R6.1 is replaced with FAC-009-1 which requires the Facility Owner to share its Facility Ratings with other entities that have a reliability-related need for those ratings, which includes RAs and TOPs.
- The need to document the methodology used to develop SOLs (as well as the subset of SOLs that are classified as IROLs) used in the operating horizon is addressed in FAC-010-1_R1. The need to develop and share SOLs with other entities that have a reliability-related need for those SOLs is addressed in FAC-011-1_R1, R2, and R5.
- The elimination of R6.5 shifts the responsibility for developing IROLs to the RA, which supports the Functional Model and assigns responsibility for developing IROLs and SOLs to the RA with assistance, as appropriate, for developing SOLs from the TOP.

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Compliance with Standard

Standard	Functions That Must Comply With the Associated Requirements					
	Reliability Coordinator	Planning Authority	Transmission Planner	Transmission Operator	Transmission Owner	Generator Owner
FAC-008-1 Facility Ratings Methodology					X	X
FAC-009-1 Establish and Communicate Facility Ratings					X	X
FAC-010-1 System Operating Limits Methodology	X	X				
FAC-011-1 Establish and Communicate System Operating Limits	X	X	X	X		
FAC-012-1 Transfer Capabilities Methodology	X	X				
FAC-013-1 Establish and Communicate Transfer Capabilities	X	X				

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Phased-in Compliance

The following table identifies the implementation date and the earliest compliance date for each requirement.

The implementation date is the date entities are expected to begin meeting the performance identified in this standard. Additional time (preparation time) has been added to give entities time needed to fully comply with the requirements. The justification for the difference between effective dates and compliance dates is in the tables on the following pages:

Requirement	Effective Date	Compliance Date
FAC-008-1 Facility Ratings Methodology	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)
FAC-009-1 Establish and Communicate Facility Ratings	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)
FAC-010-1 System Operating Limits Methodology	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)
FAC-011-1 Establish and Communicate System Operating Limits	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)
FAC-012-1 Transfer Capabilities Methodology	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)
FAC-013-1 Establish and Communicate Transfer Capabilities	January 1, 2006 (2 months from Board adoption)	March 1, 2006 (4 months from BOT adoption for all Measures)

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FAC-008-1— Facility Ratings Methodology	
Measures	Preparation
<p>M1. The Transmission Owner and Generator Owner shall each have a documented Facility Ratings Methodology that includes all of the items identified in FAC-008-1_R1.1 through FAC-008-1_R1.3.5</p>	<p>Since V0 requires that Transmission Owners and Generator Owners have a rating methodology, they should not need any additional time to reach compliance with this Measure. In recognition that the Generator Owners may not have recognized their need to be compliant with the associated V0 requirements prior to the issuance of V0 Standards, the SDT recommends a 4 month grace period for such entities to develop and assembly their Facility Ratings Methodology.</p>
<p>M2. The Transmission Owner and Generator Owner shall each have evidence it made its Facility Ratings Methodology available for inspection within 15 business days of a request as follows:</p> <p>M2.1 The Reliability Authority shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Reliability Authority Area.</p> <p>M2.2 The Transmission Operator shall have access to the Facility Ratings Methodologies used for Rating Facilities in its portion of the Reliability Authority Area.</p> <p>M2.3 The Transmission Planner shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Transmission Planning Area.</p> <p>M2.4 The Planning Authority shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Planning Authority Area.</p>	<p>Version 0 Requirements only address making the methodologies available to the Regions and NERC and don't require making the methodologies available to those entities that are expected to use them.</p> <p>The SDT recommends a grace period of 4 months to implement this measure to coincide with the documentation required in FAVC-008-1_M1.</p>
<p>M3. If the Reliability Authority, Transmission Operator, Transmission Planner or Planning Authority provides documented comments on its technical review of a Transmission Owner's or Generator Owner's Facility Ratings Methodology, the Transmission Owner or Generator Owner shall have evidence that it provided a written response to that commenting entity within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Facility Ratings Methodology and, if no change will be made to that Facility Ratings Methodology, the reason why.</p>	<p>This is a new measure and entities may want to have some time to form a strategy for responding to any comments that may be submitted on their Facility Ratings Methodology.</p> <p>The SDT recommends a grace period of 4 months to implement this measure</p>

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FAC-009-1 — Establish and Communicate Facility Ratings	
Measures	Preparation
<p>M1. The Transmission Owner and Generator Owner shall each be able to demonstrate that it developed its Facility Ratings consistent with its Facility Ratings Methodology.</p> <p>M1.1 The Transmission Owner’s and Generator Owner’s Facility Ratings shall each include ratings for its solely and jointly owned Facilities including new Facilities, existing Facilities, modifications to existing Facilities and re-ratings of existing Facilities.</p>	<p>Since V0 requires that Transmission Owners and Generator Owners have a rating methodology, they should not need any additional time to reach compliance with this Measure. In recognition that the Generator Owners may not have recognized their need to be compliant with the associated V0 requirements prior to the issuance of V0 Standards, the SDT recommends a 4 month grace period for such entities to develop and assembly their Facility Ratings Methodology. Immediately thereafter, the Facility Owner should be developing its Facility Ratings in accordance with that Methodology.</p>
<p>M2. The Transmission Owner and Generator Owner shall each have evidence that it provided its Facility Ratings to its associated Reliability Authority(ies), Planning Authority(ies), Transmission Planner(s), and Transmission Operator(s) as scheduled by such requesting entities.</p>	<p>This is not currently required and may take some time to achieve. The SDT recommends 4 months for various ‘requesting entities’ to establish and distribute schedules for providing Facility Ratings and for entities that develop Facility Ratings to begin providing the Facility Ratings in accordance with those schedules.</p>

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FAC-010-1 — System Operating Limits Methodology	
Measures	Preparation
<p>M1. The Reliability Authority and the Planning Authority’s SOL Methodology shall each include a statement that Facility Ratings shall not be exceeded and shall address all of the items listed in Reliability Standard FAC-010-1_R3 through R5.</p>	<p>Although Reliability Coordinators and Planning Authorities are, and have been, following some sort of methodology (ies), many may not have fully documented the “rules” that are being used and some of the rules may be based simply on individual judgment. The SDT recommends 4 months for the Authorities to verify the completeness of their methodology (ies) and to formalize and obtain approval for their documents.</p>
<p>M2. The Reliability Authority shall have evidence it issued its SOL Methodology, and any changes to that methodology, including the date they were issued, in accordance with FAC-010-1_R6.</p>	<p>The Reliability Coordinator should be able to issue its methodology as soon as it is formalized. Therefore the SDT recommends that the same 4 month grace period be applied to this measurement as with FAC-010-1_M1.</p>
<p>M3. The Planning Authority shall have evidence it issued its SOL Methodology and any changes to that methodology, including the date they were issued, in accordance with FAC-010-0_R7.</p>	<p>The Planning Authority should be able to issue its methodology as soon as it is formalized. Therefore the SDT recommends that the same 4 month grace period be applied to this measurement as with FAC-010-1_M1.</p>
<p>M4. If the recipient of the SOL Methodology provides documented comments on its technical review of that SOL methodology, the Reliability Authority or Planning Authority that distributed that SOL Methodology shall have evidence that it provided a written response to that commenter within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the SOL Methodology and, if no change will be made to that SOL Methodology, the reason why.</p>	<p>This is a new measure and entities may want to have some time to form a strategy for responding to any comments that may be submitted on their SOL Methodology.</p> <p>The SDT recommends a grace period of 4 months to implement this measure</p>

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FAC-011-1 — Establish and Communicate System Operating Limits	
Measures	Preparation
<p>M1. The Reliability Authority, Planning Authority, Transmission Operator, and Transmission Planner shall each be able to demonstrate that it developed its SOLs (including the subset of SOLs that are IROLs) consistent with the applicable SOL Methodology.</p>	<p>Although Reliability Coordinators, Transmission Operators, Planning Authorities and Transmission Planners are, and have been, establishing System Operating Limits, it may not be possible to prove consistency with a methodology since some methodologies may not have been fully documented and some of the “rules” used may be based simply on individual judgment.</p> <p>Since the entities performing these Functions are required to have a compliant methodology in place 4 months after Board adoption of this Standard, the SDT assumes that during the process of documenting the methodology, the individuals who are calculating the limits will be involved and will be verifying that the methodology does in fact work. This work will establish, at a minimum, a baseline of SOLs as well as a procedure to calculate any remaining limits. The SDT believes that this parallel work will allow entities to establish all its limits very close to the time that the methodology is approved.</p>
<p>M2. The Reliability Authority, Planning Authority, Transmission Operator, and Transmission Planner shall each have evidence that its SOLs (including the subset of SOLs that are IROLs) were supplied in accordance with schedules supplied by the requestors of such SOLs.</p>	<p>This is not currently required and may take some time to achieve. The SDT recommends 4 months for various ‘requesting entities’ to establish and distribute schedules for providing SOLs and for entities that develop SOLs to begin providing the SOLs in accordance with those schedules.</p>

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FAC-012-1 — Transfer Capabilities Methodology	
Measure	Preparation
M1. The Planning Authority and Reliability Authority’s methodology for determining Transfer Capabilities shall each include all of the items identified in FAC-012-1_R1.1 through FAC-012-1_R1.3.4	Although Reliability Coordinators and Planning Authorities are, and have been, following some sort of methodology, many may not have fully documented the “rules” that are being used and some of the rules may be based simply on individual judgment. The SDT recommends 4 months for entities to verify the completeness of their methodology and to formalize their documents.
M2. The Reliability Authority shall have evidence it issued its Transfer Capability Methodology in accordance with FAC-012-1_R2 through FAC-012-1_R2.3.	The Reliability Coordinator should be in a position to issue its methodology as soon as it is documented. Therefore the SDT recommends that the same 4 month grace period be applied to this measurement as with FAC-012-1_M1.
M3. The Planning Authority shall have evidence it issued its Transfer Capability Methodology in accordance with FAC-012-1_R3 through FAC-012-1_R3.3.	The Planning Authority should be in a position to issue its methodology as soon as it is documented. Therefore the SDT recommends that the same 4 month grace period be applied to this measurement as with FAC-012-1_M1.
M4. If the recipient of the Transfer Capability Methodology provides documented comments on its technical review of that Transfer Capability Methodology, the Reliability Authority or Planning Authority that distributed that Transfer Capability Methodology shall have evidence that it provided a written response to that commenter in accordance with FAC-012-1_R4.	<p>This is a new measure and entities may want to have some time to form a strategy for responding to any comments that may be submitted on their Transfer Capability Methodology.</p> <p>The SDT recommends a grace period of 4 months to implement this measure</p>

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FAC-013-1 — Establish and Communicate Transfer Capabilities	
Measure	Preparation
<p>M1. The Reliability Authority and Planning Authority shall each be able to demonstrate that it developed its Transfer Capabilities consistent with its Transfer Capability Methodology.</p>	<p>Although Reliability Coordinators and Planning Authorities are, and have been, establishing Transfer Capabilities, it may not be possible to prove consistency with a methodology since not all methodologies have been fully documented and some of the “rules” used may be based simply on individual judgment. Since entities are required to have a compliant methodology in place 4 months after Board adoption of this Standard, the SDT assumes that during the process of developing, modifying and documenting the methodology, the individuals who are calculating the Transfer Capabilities will be involved and will be verifying that the methodology does in fact work. This work will establish at a minimum a baseline of Transfer Capabilities. The SDT believes that this parallel work will allow entities to establish all its Transfer Capabilities very close to the time that the methodology is formalized.</p>
<p>M2. The Reliability Authority and Planning Authority shall each have evidence that it provided its Transfer Capabilities in accordance with schedules supplied by the requestors of such Transfer Capabilities.</p>	<p>This is not currently required and may take some time to achieve. The SDT recommends 4 months for various ‘requesting entities’ to establish and distribute schedules for providing Transfer Capabilities and for entities that develop Transfer Capabilities to begin providing the Transfer Capabilities in accordance with those schedules.</p>