

Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

Development Steps Completed:

1. SAC approves SAR for posting (March 20, 2002).
2. Drafting Team posts Draft SAR for comment periods (April 2–May 3, 2002) (September 24–October 25, 2002) (December 13–January 31, 2003).
3. SAC approves development of standard (February 27, 2003).
4. JIC assigns development of standard to NERC (March 21, 2003).
5. Drafting Team posts Drafts for comment (July 1–August 29, 2003) (December 1–January 21, 2004)

Description of Current Draft:

Draft 3 is posted for a 45-day comment period. This version reflects the consideration of industry comments submitted with the second posting of the standard and changes made to address some of the blackout concerns relative to ratings. The SDT put the standard into the ‘new’ standard format established with Version 0 Standards. With the new format, each of the six original major requirements is now a ‘stand-alone’ standard, sequentially numbered FAC-008-1 through FAC-013-1.

Future Development Plan:

Anticipated Actions

Anticipated Date

- | | |
|---|------------------|
| 1. Post final draft of standard for 30-day review prior to 1 st ballot | To be determined |
| 2. First ballot | To be determined |
| 3. Recirculation ballot | To be determined |
| 4. 30-day posting before board adoption | To be determined |
| 5. Board adopts standard | To be determined |
| 6. Effective date | To be determined |

DEFINITIONS OF TERMS USED IN STANDARD

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Equipment Rating: The maximum and minimum voltage, current, frequency, real, and reactive power flows on individual equipment under steady state, short-circuit and transient conditions, as permitted or assigned by the equipment owner.

Facility: A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generating plant, a shunt compensator, transformer, etc.)

Performance-Reset Period: The time period that the entity being assessed must operate without any violations to reset the level of non-compliance to zero.

A. Introduction

- 1. Title:** Facility Ratings Methodology
- 2. Number:** FAC-008-1
- 3. Purpose:** To ensure the determination of Facility Ratings that form the basis of the reliable planning and operation of the Bulk Electric System (BES).
- 4. Applicability**
 - 4.1.** Transmission Owner
 - 4.2.** Generator Owner
- 5. Effective Date:** Two months after Board of Trustees adoption.

B. Requirements

- 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:
 - R1.1.** A statement that a Facility Rating shall equal the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.
 - R1.2.** The method by which the Rating (of major BES equipment that comprises a Facility) is determined.
 - R1.2.1.** The scope of equipment addressed shall include, but not be limited to, generators, transmission conductors, transformers, terminal equipment, series, and shunt compensation devices.
 - R1.3.** Consideration of the following:
 - R1.3.1.** Ratings provided by equipment suppliers.
 - R1.3.2.** Design criteria (e.g., including applicable references to industry Rating practices or other standards).
 - R1.3.3.** Ambient conditions.
 - R1.3.4.** Any other assumptions.
- R2.** The Transmission Owner and Generator Owner shall each make its Facility Ratings Methodology available for inspection and technical review by those Reliability Authorities, 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.
- R3.** If the Reliability Authority 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 Reliability Authority or Planning Authority within 30 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.

C. Measures

- M1.** The Transmission Owner and Generator Owner shall each have a documented Facility Ratings Methodology that includes all of the following:

- M1.1** A statement that a Facility Rating shall equal the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.
- M1.2** The method by which the Rating (of major BES equipment that comprises a Facility) is determined.
 - M1.2.1** The scope of equipment addressed shall include, but not be limited to, generators, transmission conductors, transformers, terminal equipment, series, and shunt compensation devices.
- M1.3** Consideration of the following:
 - M1.3.1** Ratings provided by equipment suppliers.
 - M1.3.2** Design criteria (e.g., including applicable references to industry Rating practices or other standards).
 - M1.3.3** Ambient conditions.
 - M1.3.4** Any other assumptions.
- 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:
 - M2.1** The Reliability Authority shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Reliability Authority Area.
 - 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.
 - M2.3** The Transmission Planner shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Transmission Planning Area.
 - M2.4** The Planning Authority shall have access to the Facility Ratings Methodologies used for Rating Facilities in its Planning Authority Area.
- M3.** If the Reliability Authority 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 Reliability Authority or Planning Authority within 30 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.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization

1.2. Compliance Monitoring Period and Reset Timeframe

The Transmission Owner and Generator Owner shall each demonstrate compliance through an on-site audit conducted by the Compliance Monitor within the first year that the entity commences operation. The Responsible Entity shall self-certify its compliance to the Compliance Monitor once every three years. The Compliance Monitor may also conduct an on-site audit once every nine years and an investigation upon complaint to assess performance.

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

1.3. Data Retention

The Transmission Owner and Generator Owner shall each keep all superseded portions of its Facility Ratings Methodology for 12 months beyond the date of the change in that methodology and shall keep all documented comments on the Facility Ratings Methodology and associated responses for three years. In addition, entities found non-compliant shall keep information related to the non-compliance until it has been found compliant. The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

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

1.4.1 Facility Ratings Methodology.

1.4.2 Superseded portions of its Facility Ratings Methodology that had been made within the past 12 months.

1.4.3 Documented comments provided by a Reliability Authority or Planning Authority on its technical review of a Transmission Owner's or Generator Owner's Facility Ratings methodology, and the associated responses.

2. Levels of Non-Compliance

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

2.1.1 The Facility Ratings Methodology does not contain a statement that a Facility Rating shall equal the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

2.1.2 The Facility Ratings Methodology does not address one of the required equipment types.

2.1.3 No evidence of responses to a Reliability Authority's or Planning Authority's comments on the Facility Ratings Methodology.

2.2. Level 2: The Facility Ratings Methodology is missing the assumptions used to determine Facility Ratings or does not address two of the required equipment types.

2.3. Level 3: The Facility Ratings Methodology does not address three of the required equipment types.

2.4. Level 4: The Facility Ratings Methodology was not made available for inspection within 15 business days of receipt of a request.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
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Future Development Plan:

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No new terms introduced in this standard.

A. Introduction

- 1. Title:** Establish and Communicate Facility Ratings
- 2. Number:** FAC-009-1
- 3. Purpose:** To ensure the determination of Facility Ratings that form the basis of the reliable planning and operation of the Bulk Electric System (BES).
- 4. Applicability**
 - 4.1.** Transmission Owner
 - 4.2.** Generator Owner
- 5. Effective Date:** Two months after Board of Trustees adoption.

B. Requirements

- 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.
- R2.** The Transmission Owner and Generator Owner shall each provide Facility Ratings for its solely and jointly owned Facilities that are existing, new, modifications to, and re-ratings of, existing Facilities to its associated Reliability Authority(ies), Planning Authority(ies), Transmission Planner(s), and Transmission Operator(s) as scheduled by such requesting entities.

C. Measures

- 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.
 - 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.
- 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.

D. Compliance

- 1. Compliance Monitoring Process**
 - 1.1. Compliance Monitoring Responsibility**

Regional Reliability Organization.
 - 1.2. Compliance Monitoring Period and Reset Timeframe**

The Transmission Owner and Generator Owner shall each verify compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may conduct a targeted audit once in each calendar year (January–December) and an investigation upon complaint to assess performance.

The Performance-Reset Period shall be twelve months from the last finding of non-compliance. In addition, entities found non-compliant shall keep information related to the non-compliance until it has been found compliant.

1.3. Data Retention

The Transmission Owner and Generator Owner shall each keep documentation for 12 months. The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

The Transmission Owner and Generator Owner shall each make the following available for inspection during a targeted audit by the Compliance Monitor or within 5 business days of a request as part of an investigation upon complaint:

1.4.1 Facility Ratings Methodology.

1.4.2 Facility Ratings.

1.4.3 Evidence that Facility Ratings were distributed.

1.4.4 Distribution schedules provided by entities that requested Facility Ratings.

2. Levels of Non-Compliance

2.1. Level 1: Some, but not all, requested Facility Ratings associated with existing Facilities were provided to the Reliability Authority(ies), Planning Authority(ies), Transmission Planner(s), and Transmission Operator(s) in accordance with their respective schedules.

2.2. Level 2: Some, but not all, Facility Ratings associated with new Facilities, modifications to existing Facilities, and re-ratings of existing Facilities were provided to the Reliability Authority(ies), Planning Authority(ies), Transmission Planner(s), and Transmission Operator(s) in accordance with their respective schedules.

2.3. Level 3: Facility Ratings provided were not developed consistent with the Facility Ratings Methodology.

2.4. Level 4: No Facility Ratings were provided to the Reliability Authority(ies), Planning Authority(ies), Transmission Planner(s), or Transmission Operator(s) in accordance with their respective schedules.

E. Regional Differences

1. None identified.

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Cascading Outages: The uncontrolled and unplanned successive loss of system elements triggered by an incident at any location.

Contingency: The unexpected outage of a system component. A single contingency also may result in outages of multiple Facilities.

Delayed Fault Clearing: Fault clearing consistent with correct operation of a breaker failure protection system and its associated breakers, or of a backup protection system with an intentional time delay.

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

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

Normal Clearing: A protection system operates as designed and the fault is cleared in the time normally expected with proper functioning of the installed protection systems.

Pre-Contingency State: A 'normal' stable system state either before any Contingency or following a Contingency situation where adjustments have been made to the system to bring the system back to 'normal'.

A. Introduction

- 1. Title:** System Operating Limits Methodology
- 2. Number:** FAC-010-1
- 3. Purpose:** To ensure the determination of System Operating Limits (SOLs) that result in the reliable planning and operation of the Bulk Electric System (BES).
- 4. Applicability**
 - 4.1.** Reliability Authority
 - 4.2.** Planning Authority
- 5. Effective Date:** Two months after Board of Trustees adoption.

B. Requirements

- R1.** The Reliability Authority shall document its methodology for use in developing SOLs (SOL Methodology) within its Reliability Authority Area. The Reliability Authority's SOL Methodology shall be applicable for developing SOLs used in the operations horizon. The Reliability Authority's SOL Methodology shall state that SOLs shall not exceed associated Facility Ratings. The Reliability Authority's SOL Methodology shall include a description of how to identify the subset of SOLs that qualify as IROLs.
- R2.** The Planning Authority shall document its SOL Methodology for use in developing SOLs within its Planning Authority Area. The Planning Authority's SOL Methodology shall be applicable for developing SOLs used in the planning horizon. The Planning Authority's SOL Methodology shall state that SOLs shall not exceed associated Facility Ratings. The Planning Authority's SOL Methodology shall include a description of how to identify the subset of SOLs that qualify as IROLs.
- R3.** The Reliability Authority and Planning Authority shall, by mutual agreement, identify and document in their respective SOL Methodologies the planning and operating time horizons addressed in one another's SOL Methodologies. The combined horizons shall cover real-time through the end of the planning horizon.
- R4.** The Reliability Authority and Planning Authority shall each document its SOL Methodology and each methodology shall include a requirement that SOLs provide BES performance consistent with the following:
 - R4.1.** In the Pre-Contingency State, the BES shall demonstrate transient, dynamic, and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the determination of SOLs, the BES condition used shall reflect current or expected system conditions and shall reflect changes to system topology such as Facility outages.
 - R4.2.** Following the single Contingencies¹ identified in Reliability Standard FAC-010-1_R4.2.1 through R4.2.3, the system shall demonstrate transient, dynamic, and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.

¹ The Contingencies identified in FAC-010-1_R4.2.1 through R4.2.3 are the minimum contingencies that must be studied but are not necessarily the only Contingencies that should be studied.

- R6.** The Reliability Authority shall issue its SOL Methodology and any changes to that methodology, to all of the following:
 - R6.1.** Each adjacent Reliability Authority and each Reliability Authority that indicated it has a reliability-related need for the methodology.
 - R6.2.** Each Planning Authority and Transmission Planner that models any portion of the Reliability Authority's Reliability Authority Area.
 - R6.3.** Each Transmission Operator that operates in the Reliability Authority Area.
- R7.** The Planning Authority shall issue its SOL Methodology, and any change to that methodology, to all of the following:
 - R7.1.** Each adjacent Planning Authority.
 - R7.2.** Each Reliability Authority and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
 - R7.3.** Each Transmission Planner that works in the Planning Authority's Planning Authority Area.
- R8.** The Reliability Authority and Planning Authority shall each issue its SOL Methodology and any changes to that methodology to required entities prior to the effectiveness of the change.
- R9.** If a recipient of the SOL Methodology provides documented technical comments on the methodology, the Reliability Authority or Planning Authority shall provide a documented response to that recipient within 30 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.

C. Measures

- 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.
- M2.** The Reliability Authority shall have evidence it issued its SOL Methodology, and any changes to that methodology, including the date they were issued, to all of the following:
 - M2.1** Each adjacent Reliability Authority and each Reliability Authority that indicated it has a reliability-related need for the methodology.
 - M2.2** Each Planning Authority and Transmission Planner that models any portion of the Reliability Authority's Reliability Authority Area.
 - M2.3** Each Transmission Operator that operates in the Reliability Authority Area.
- M3.** The Planning Authority shall have evidence it issued its SOL Methodology and any changes to that methodology, including the date they were issued, to all of the following:
 - M3.1** Each adjacent Planning Authority.
 - M3.2** Each Reliability Authority and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
- 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 30 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.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Timeframe

The Planning Authority and Reliability Authority shall each demonstrate compliance through an on-site audit conducted by the Compliance Monitor within the first year that the entity commences operation. The Planning Authority and Reliability Authority shall each self-certify its compliance to the Compliance Monitor once every three years. The Compliance Monitor may also conduct an on-site review once every nine years and investigations upon complaint to assess performance. The Performance-Reset Period shall be twelve months from the last non-compliance.

1.3. Data Retention

The Planning Authority and Reliability Authority shall each keep all superseded portions to its SOL Methodology for 12 months beyond the date of the change in that methodology and shall keep all documented comments on its SOL Methodology and associated responses for three years. In addition, entities found non-compliant shall keep information related to the non-compliance until it has been found compliant. The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

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

1.4.1 SOL Methodology.

1.4.2 Documented comments provided by a recipient of the SOL Methodology on its technical review of a SOL Methodology, and the associated responses.

1.4.3 Superseded portions of its SOL Methodology that had been made within the past 12 months.

1.4.4 Evidence that the SOL Methodology and any changes to the methodology that occurred within the past 12 months were issued to all required entities.

2. Levels of Non-Compliance (Does not apply to the Western Interconnection)

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

2.1.1 The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded.

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

Level 2: The SOL Methodology did not include a requirement to address all of the elements in Reliability Standard FAC-010-1_R4.

Level 3: There shall be a level three noncompliance if either of the following conditions exists:

2.1.3 The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded **and** the methodology did not include evaluation of system response to one of the three types of single Contingencies identified in Reliability Standard FAC-010-1_R4.2.

2.1.4 The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded **and** the methodology did not address two of the six required topics in Reliability Standard FAC-010-1_R5.

2.2. Level 4: The SOL Methodology was not issued to all required entities.

3. Levels of Non-compliance for Western Interconnection:

3.1. Level one: The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded.

3.2. Level two: The SOL Methodology did not include a requirement to address all of the elements in Reliability Standard FAC-010-1_R4 and FAC-010-1_E1.

3.3. Level three: There shall be a level three noncompliance if any of the following conditions exists:

3.3.1 The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to one of the three types of single Contingencies identified in Reliability Standard FAC-010-1_R4.2.

3.3.2 The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to two of the seven types of multiple Contingencies identified in FAC-010-1_E1.1.

3.3.3 The System Operating Limits Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not address two of the six required topics in FAC-010-1_R5.

3.4. Level four: The SOL Methodology was not issued to all required entities.

E. Regional Differences

1. The following Interconnection – Wide Regional Difference shall be applicable in the Western Interconnection:

1.1. The methodology required in Reliability Standard FAC-010-1_R4.4 shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:

1.1.1 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.

1.1.2 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 Reliability Standard FAC-010-1_E1.1.7

- 1.1.3 Simultaneous permanent loss of both poles of a direct current bipolar Facility without an alternating current Fault.
- 1.1.4 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.
- 1.1.5 A non-three phase Fault with Normal Clearing on common mode Contingency of two adjacent circuits on separate towers unless the event frequency is determined to be less than one in thirty years.
- 1.1.6 A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by Reliability Standard FAC-008-0.
- 1.1.7 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.
- 1.2. SOLs shall be established such that for multiple Facility Contingencies in Reliability Standard FAC-010-1_E1.1.1 through FAC-010-1_E1.1.5 operation within the SOL shall provide system performance consistent with the following:
 - 1.2.1 All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.
 - 1.2.2 Cascading Outages do not occur.
 - 1.2.3 Uncontrolled separation of the system does not occur.
 - 1.2.4 The system demonstrates transient, dynamic, and voltage stability.
 - 1.2.5 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.
 - 1.2.6 Interruption of firm transfer, Load or system reconfiguration is permitted through manual or automatic control or protection actions.
 - 1.2.7 To prepare for the next Contingency, system adjustments are permitted, including changes to generation, Load and the transmission system topology when determining limits.
- 1.3. SOLs shall be established such that for multiple Facility Contingencies in FAC-010-1_E1.1.6 through FAC-010-1_E1.1.7 operation within the SOL shall provide system performance consistent with the following with respect to impacts on other systems:
 - 1.3.1 Cascading Outages do not occur.
- 1.4. The Western Interconnection 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 SOLs.

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| 6. Effective date | To be determined |

DEFINITIONS OF TERMS USED IN STANDARD

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

None introduced in this standard.

A. Introduction

- 1. Title:** **Establish and Communicate System Operating Limits**
- 2. Number:** **FAC-011-1**
- 3. Purpose:** To ensure the determination of System Operating Limits (SOLs) that result in the reliable planning and operation of the Bulk Electric System (BES).
- 4. Applicability**
 - 4.1.** Reliability Authority
 - 4.2.** Planning Authority
 - 4.3.** Transmission Planner
- 5. Effective Date:** To be determined.

B. Requirements

- R1.** The Reliability Authority shall ensure that SOLs, including Interconnection Reliability Operating Limits (IROLs), for its Reliability Authority Area are established and that the SOLs (including Interconnection Reliability Operating Limits) are consistent with its SOL Methodology.
- R2.** The Planning Authority shall establish SOLs, including IROLs for its Planning Authority Area that are consistent with its SOL Methodology.
- R3.** The Transmission Planner shall establish SOLs, including IROLs, for its Transmission Planning Area that are consistent with its Planning Authority's SOLs Methodology.
- R4.** The Reliability Authority, 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:
 - R4.1.** The Reliability Authority shall provide its SOLs (including the subset of SOLs that are IROLs) to adjacent Reliability Authorities and Reliability Authorities who indicate a reliability-related need for those limits, and to the Transmission Operators, Transmission Service Providers and Planning Authorities within its Reliability Authority Area. For each IROL, the Reliability Authority shall provide the following supporting information:
 - R4.1.1.** Identification and status of the associated Facility (or group of Facilities) that is (are) critical to the derivation of the IROL.
 - R4.1.2.** The value of the IROL and its associated T_v .
 - R4.1.3.** The associated Contingency(ies).
 - R4.1.4.** The type of limitation represented by the IROL (e.g., voltage collapse, angular stability).
 - R4.2.** The Transmission Operator shall provide its SOLs to its Reliability Authority and to the Transmission Service Providers that share its portion of the Reliability Authority Area.
 - R4.3.** The Planning Authority shall provide its SOLs (including the subset of SOLs that are IROLs) to adjacent Planning Authorities, and to Transmission Planners, Transmission Service Providers, Transmission Operators and Reliability Authorities that work within its Planning Authority Area.

- R4.4.** The Transmission Planner shall provide its SOLs (including the subset of SOLs that are IROLs) to its Planning Authority, Reliability Authorities, Transmission Operators, Transmission Service Providers that work within its Transmission Planning Area and to adjacent Transmission Planners.

C. Measures

- M1.** The Reliability Authority, Planning Authority and Transmission Planner shall each be able to demonstrate that its SOLs (including the subset of SOLs that are IROLs) were developed consistent with its applicable SOL Methodology.
- M2.** The Reliability Authority, Planning Authority 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.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Timeframe

The Reliability Authority, Planning Authority, and Transmission Planner shall each verify compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may conduct a targeted audit once in each calendar year (January – December) and an investigation upon a complaint to assess performance.

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

1.3. Data Retention

The Reliability Authority, Planning Authority, and Transmission Planner shall each keep documentation for 12 months. In addition, entities found non-compliant shall keep information related to non-compliance until it has been found compliant. The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

The Reliability Authority, Planning Authority, and Transmission Planner shall each make the following available for inspection during a targeted audit by the Compliance Monitor or within 5 business days of a request as part of an investigation upon complaint:

1.4.1 SOL Methodology(ies).

1.4.2 SOLs, including the subset of SOLs that are IROLs and the IROL's supporting information.

1.4.3 Evidence that SOLs were distributed.

1.4.4 Distribution schedules provided by entities that requested SOLs.

2. Levels of Non-Compliance

2.1. Level 1: Not applicable.

2.2. Level 2: Some, but not all SOLs were provided in accordance with their respective schedules.

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2.3. Level 3: SOLs provided were not developed consistent with the SOL Methodology.

2.4. Level 4: No SOLs were provided in accordance with their respective schedules.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
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Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

Development Steps Completed:

1. SAC approves SAR for posting (March 20, 2002).
2. Drafting Team posts Draft SAR for comment periods (April 2–May 3, 2002) (September 24–October 25, 2002) (December 13–January 31, 2003)
3. SAC approves development of standard (February 27, 2003).
4. JIC assigns development of standard to NERC (March 21, 2003).
5. Drafting Team posts Drafts for comment (July 1–August 29, 2003) (December 1–January 21, 2004)

Description of Current Draft:

Draft 3 is posted for a 45-day comment period. This draft includes revisions based on industry comments received during the posting of Draft 2, and changes made to address some of the blackout concerns relative to limits. The SDT put the standard into the ‘new’ standard format established with Version 0 Standards. With the new format, each of the six original major requirements is now a ‘stand-alone’ standard, sequentially numbered FAC-008-1 through FAC-013-1.

Future Development Plan:

Anticipated Actions

Anticipated Date

- | | |
|---|------------------|
| 1. Post final draft of standard for 30-day review prior to 1 st ballot | To be determined |
| 2. First ballot | To be determined |
| 3. Recirculation ballot | To be determined |
| 4. 30-day posting before board adoption | To be determined |
| 5. Board adopts standard | To be determined |
| 6. Effective date | To be determined |

DEFINITIONS OF TERMS USED IN STANDARD

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

No new terms introduced in this standard.

A. Introduction

- 1. Title:** Transfer Capability Methodology
- 2. Number:** FAC-012-1
- 3. Purpose:** To ensure the determination of Transfer Capabilities that result in the reliable planning and operation of the Bulk Electric System (BES).
- 4. Applicability**
 - 4.1.** Reliability Authority
 - 4.2.** Planning Authority
- 5. Effective Date:** Two months after Board of Trustees Adoption.

B. Requirements

- R1.** The Reliability Authority and Planning Authority shall each document its current methodology used for developing its inter-regional and intra-regional Transfer Capabilities (Transfer Capability Methodology). The Transfer Capability Methodology shall include all of the following:
 - R1.1.** A statement that Transfer Capabilities shall respect all applicable System Operating Limits (SOLs).
 - R1.2.** A definition stating whether the methodology is applicable to the planning horizon or the operating horizon.
 - R1.3.** A description of how each of the following is addressed, including any reliability margins applied to reflect uncertainty with projected BES conditions:
 - R1.3.1.** Transmission system topology.
 - R1.3.2.** System demand.
 - R1.3.3.** Generation dispatch.
 - R1.3.4.** Current and projected transmission uses.
- R2.** The Reliability Authority shall issue its Transfer Capability Methodology, and any changes, prior to the effectiveness of such changes, to that methodology, to all of the following:
 - R2.1.** Each Adjacent Reliability Authority and each Reliability Authority that indicated a reliability-related need for the methodology.
 - R2.2.** Each Planning Authority and Transmission Planner that models any portion of the Reliability Authority's Reliability Authority Area.
 - R2.3.** Each Transmission Operator that operates in the Reliability Authority Area.
- R3.** The Planning Authority shall issue its Transfer Capability Methodology, and any changes, prior to the effectiveness of such changes, to that methodology, to all of the following:
 - R3.1.** Each adjacent Planning Authority.
 - R3.2.** Each Reliability Authority and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
 - R3.3.** Each Transmission Planner that works in the Planning Authority's Planning Authority Area.

- R4.** If a recipient of the Transfer Capability Methodology provides documented technical comments on the methodology, the Reliability Authority or Planning Authority shall provide a documented response to that recipient within 30 days of receipt of those comments. The response shall indicate whether a change will be made to the Transfer Capability Methodology and, if no change will be made to that Transfer Capability Methodology, the reason why.

C. Measures

- M1.** The Planning Authority and Transmission Planner's methodology for determining Transfer Capabilities shall each include all of the following:
- M1.1** A statement that Transfer Capabilities shall respect all applicable SOLs.
 - M1.2** A definition stating whether the methodology is applicable to the planning horizon or the operating horizon.
 - M1.3** A description of how each of the following is addressed, including any reliability margins applied to reflect uncertainty with projected system conditions:
 - M1.1.3** Transmission system topology.
 - M2.1.3** System demand.
 - M3.1.3** Generation dispatch.
 - M4.1.3** Current and projected transmission uses.
- M2.** The Reliability Authority shall have evidence it issued its Transfer Capability Methodology, and any changes to that methodology, including the date issued to each of the following:
- M2.1** Each Adjacent Reliability Authority and each Reliability Authority that indicated a reliability-related need for the methodology.
 - M2.2** Each Planning Authority and Transmission Planner that models any portion of the Reliability Authority's Reliability Authority Area.
 - M2.3** Each Transmission Operator that operates in the Reliability Authority Area.
- M3.** The Planning Authority shall have evidence it issued its Transfer Capability Methodology, and any changes to that methodology, including the date issued to the following:
- M3.1** Each adjacent Planning Authority.
 - M3.2** Each Reliability Authority and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
 - M3.3** Each Transmission Planner that works in the Planning Authority's Planning Authority Area.
- M4.** The Planning Authority and Reliability Authority shall each have evidence that its Transfer Capability Methodology and changes to that methodology were issued to all required entities, including the date they were issued.
- M5.** 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 within 30 days of receipt of those comments. The response shall indicate whether a change will be made to the Transfer Capability Methodology and, if no change will be made to that Transfer Capability Methodology, the reason why.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Timeframe

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

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

1.3. Data Retention

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

1.4. Additional Compliance Information

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

1.4.1 Transfer Capability Methodology.

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

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

2. Levels of Non-Compliance

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

2.1.1 The Transfer Capability Methodology is missing any one of the required statements or descriptions.

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

2.2. Level 2: The Transfer Capability Methodology is missing any two of the required statements or descriptions or a combination thereof.

2.3. Level 3: The Transfer Capability Methodology is missing any three or more of the required statements or descriptions or combinations thereof.

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

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
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Anticipated Actions

Anticipated Date

- | | |
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| 5. Board adopts standard | To be determined |
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No new terms introduced in this standard.

A. Introduction

1. Title: Establish and Communicate Transfer Capabilities

2. Number: FAC-013-1

Purpose: To ensure the determination of Transfer Capabilities that result in the reliable planning and operation of the Bulk Electric System (BES).

3. Applicability

3.1. Reliability Authority

3.2. Planning Authority

4. Effective Date: Two months after Board of Trustees adoption.

B. Requirements

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

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

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

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

C. Measures

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.

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.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Timeframe

The Reliability Authority and Planning Authority shall each verify compliance through self-certification submitted to the Compliance Monitor annually. The Compliance Monitor may conduct a targeted audit once in each calendar year (January – December) and an investigation upon a complaint to assess compliance.

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

1.3. Data Retention

The Planning Authority and Reliability Authority shall each keep documentation for 12 months. In addition, entities found non-compliant shall keep information related to the non-compliance until it has been found compliant. The Compliance Monitor shall keep the last audit and all subsequent compliance records.

1.4. Additional Compliance Information

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

1.4.1 Transfer Capability Methodology.

1.4.2 Inter-regional and Intra-regional Transfer Capabilities.

1.4.3 Evidence that Transfer Capabilities were distributed.

1.4.4 Distribution schedules provided by entities that requested Transfer Capabilities.

2. Levels of Non-Compliance

2.1. Level 1: Not applicable.

2.2. Level 2: Some, but not all requested Transfer Capabilities were provided in accordance with their respective schedules.

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

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

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
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