

## Mapping Document for FAC-014-3

### Project 2015-09 Establish and Communicate System Operating Limits

#### Standard: FAC-014-2 Establish and Communicate System Operating Limits

Requirement in Approved Standard	Translation to New Standard or Other Action	Description and Change Justification
<p><u>FAC-014-2, Requirement R1</u></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><u>Requirements R1, R2, and R4 of FAC-014-3</u></p> <p>R1. Each Reliability Coordinator shall establish Interconnection Reliability Operating Limits (IROLs) for its Reliability Coordinator Area in accordance with its System Operating Limit methodology (SOL methodology).</p> <p>R2. Each Transmission Operator shall establish System Operating Limits (SOLs) for its portion of the Reliability Coordinator Area in accordance with its Reliability Coordinator’s SOL methodology.</p> <p>R4. Each Reliability Coordinator shall establish stability limits when the limit impacts adjacent Reliability Coordinator Areas or more than one Transmission Operator in its Reliability Coordinator Area in accordance with its SOL methodology.</p>	<p>Requirements R1, R2, and R4 of FAC-014-3 ensure that SOLs are established in accordance with the Reliability Coordinator’s (RC’s) SOL methodology.</p> <p>Requirement R1 was changed to address an issue with the existing language in FAC-014-2, Requirement R1. With the original language, the RC is responsible for ensuring that SOLs established by the Transmission Operator (TOP) per FAC-014-2, Requirement R2 are consistent with the RC’s SOL methodology. This creates a situation where the RC is responsible for “ensuring” the actions of the TOP.</p> <p>Accordingly, if the TOP does not establish SOLs per its RC’s SOL methodology, then 1) the TOP is in violation of Requirement R2, and 2) the RC by default is in violation of Requirement R1 because the RC did</p>

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		<p>not ensure that the TOP’s SOL was consistent with its SOL methodology.</p> <p>The proposed revision addresses this issue and clarifies the appropriate responsibilities of the respective functional entities.</p> <p>Additionally, this requirement carries forward the obligation of the RC to establish IROLs for its RC Area. The RC maintains primary responsibility for establishment of IROLs because these limits have the potential to impact a Wide-area.</p> <p>FAC-011-4 requirement R4 further addresses the RC responsibilities (beyond IROL establishment) for stability limit establishment where more than one TOP is impacted.</p>
<p><u>FAC-014-2, Requirement R2</u></p> <p>R2. The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability</p>	<p><u>FAC-014-3, Requirement R2</u></p> <p>R2. Each Transmission Operator shall establish System Operating Limits (SOLs) for its portion of the Reliability Coordinator Area in accordance with its Reliability Coordinator’s SOL methodology.</p>	<p>The language from the existing FAC-014-2, Requirement R2 that states the TOP, “(as directed by its Reliability Coordinator)” was removed because it causes confusion and may be incorrectly understood to mean that the TOPs are</p>

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<p>Coordinator Area that are consistent with its Reliability Coordinator’s SOL methodology.</p>		<p>only required to establish SOLs if they have been “directed to by their RC.” This is not the intended meaning of the requirement, thus, the drafting team has removed the unnecessary and potentially confusing language. The proposed language makes clear that the TOP is the entity responsible for establishing SOLs, and that these SOLs must be established in accordance with the RC’s SOL methodology.</p>
<p><u>FAC-014-2, Requirements R3 and R4</u></p> <p>R3. The Planning Authority shall establish SOLs, including IROLs, for its Planning Authority Area that are consistent with its SOL methodology.</p> <p>R4. The Transmission Planner shall establish SOLs, including IROLs, for its Transmission Planning Area that are consistent with its Planning Authority’s SOL methodology.</p>	<p>FAC-011-4, Requirement R9, Part 9.2, Subpart 9.2.2</p> <p>FAC-014-3, Requirement R6</p> <p><u>FAC-011-4, Requirement R9, Part 9.2:</u></p> <p><b>R9.</b> Each Reliability Coordinator shall provide its SOL methodology to:</p> <p><b>9.2</b> Each of the following entities prior to the effective date of the SOL methodology:</p> <p><b>9.2.2</b> Each Planning Coordinator and Transmission Planner that is responsible for</p>	<p>The SDT is proposing a construct that does not make use of an SOL methodology applicable to the planning horizon or the establishment of SOLs consistent with the PC’s SOL methodology.</p> <p>The PCs and TPs responsible for planning any portion of the RC’s Area are made aware of the RC’s SOL methodology through FAC-011-4, Requirement R9, Part 9.2.2. By having the RC’s SOL methodology, PCs and TPs who plan any portion of the System in the RC Area have knowledge of the methods and criteria</p>

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	<p style="text-align: right;">planning any portion of the Reliability Coordinator Area;</p> <p><u>FAC-014-3 Requirement R6:</u></p> <p><b>R6.</b> Each Planning Coordinator and each Transmission Planner shall implement a documented process to use Facility Ratings, System steady-state voltage limits and stability criteria in its Planning Assessment of the Near-Term Transmission Planning Horizon that are equally limiting or more limiting than the criteria for Facility Ratings, System Voltage Limits and stability criteria specified described in its respective Reliability Coordinator’s SOL methodology.</p> <ul style="list-style-type: none"> <li>• The Planning Coordinator may use less limiting Facility Ratings, System steady-state voltage limits and stability criteria if it provides a technical rationale Each Planning Coordinator shall provide a technical rationale for any exceptions to each affected Transmission Planner, Transmission Operator and Reliability Coordinator.</li> <li>• The Transmission Planner may use less limiting Facility Ratings, System steady-state voltage limits and stability criteria if it provides a</li> </ul>	<p>for establishing SOLs, including the stability performance criteria used for establishing stability limits in the operations horizon.</p> <p>Proposed FAC-011-4 and FAC-014-3 represent an improvement for planning and operations to better work together to address the reliability issues that are ultimately faced in Real-time operations. FAC-014-3, Requirement R6 ensures that Planning Assessments performed for the Near-Term Transmission Planning Horizon (required by TPL-001-4), are bounded by modeling data and performance criteria that are equally limiting or more limiting than those described within the RC’s SOL methodology. FAC-014-3, Requirement R6 addresses the three components of SOLs used in operations and thus facilitates continuity between operations and planning, which is conducive to improved reliability.</p>

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	<p>technical rationale Each Transmission Planner shall provide a technical rationale for any exceptions to each affected Planning Coordinator, Transmission Operator and Reliability Coordinator.</p>	
<p><u>FAC-014-2, Requirement R5, R5.1</u></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 Planners, 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>The communication of SOL and IROL information from the Reliability Coordinator is addressed by:</p> <ol style="list-style-type: none"> <li>1. FAC-014-3, Requirement R5 (addresses communication from the Reliability Coordinator to other entities)</li> <li>2. IRO-014-3, Requirement R1 (addresses communication between Reliability Coordinators to support reliable operations)</li> </ol> <p><u>FAC-014-3, Requirement R5:</u></p> <p>R5. Each Reliability Coordinator shall provide:</p> <ol style="list-style-type: none"> <li>5.1. Each Planning Coordinator and each Transmission Planner within its Reliability Coordinator Area, SOLs for its Reliability Coordinator Area (including the subset of SOLs that are IROLs) at least once every twelve calendar months.</li> <li>5.2. Each impacted Planning Coordinator and each impacted Transmission Planner within its</li> </ol>	<p>While the existing requirements in FAC-014-2, Requirement R5 are preserved in FAC-014-3, Requirement R5, FAC-014-3, Requirement R5 more specifically address the communications requirements for the RC. Each recipient of the RC communications is addressed in a separate subpart because each recipient has a slightly different need. This approach represents an improvement over the former approach.</p> <p>IRO-014-3, Requirement R1 and subparts addresses RC communication of critical operational information to adjacent RCs, which addresses RC-to-RC communication and coordinated operations issues.</p>

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<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 Tv.</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>Reliability Coordinator Area, the following information for each established stability limit and each established IROL at least once every twelve calendar months:</p> <p>5.2.1. The value of the stability limit or IROL;</p> <p>5.2.2. Identification of the Facilities that are critical to the derivation of the stability limit or IROL;</p> <p>5.2.3. The associated IROL Tv for any IROL;</p> <p>5.2.4. The associated Contingency(ies);</p> <p>5.2.5. A description of system conditions associated with the stability limit or IROL; and</p> <p>5.2.6. The type of limitation represented by the stability limit or IROL (e.g., voltage collapse, angular stability).</p> <p>5.3. Each impacted Transmission Operator within its Reliability Coordinator Area, the value of the stability limits established pursuant to Requirement R4 and each IROL established pursuant to Requirement R1, in an agreed upon time frame necessary for inclusion in the Transmission Operator’s Operational Planning</p>	

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	<p>Analyses, Real-time monitoring, and Real-time Assessments.</p> <p>5.4. Each impacted Transmission Operator within its Reliability Coordinator Area, the information identified in Requirement R5 Parts 5.2.2 – 5.2.6 for each established stability limit or each IROL, and any updates to that information within an agreed upon time frame necessary for inclusion in the Transmission Operator’s Operational Planning Analyses.</p> <p>5.5. Each requesting Transmission Operator within its Reliability Coordinator Area, requested SOL information for its Reliability Coordinator Area, on a mutually agreed upon schedule.</p> <p><u>IRO-014-3, Requirement R1</u></p> <p>R1. Each Reliability Coordinator shall have and implement Operating Procedures, Operating Processes, or Operating Plans, for activities that require notification or coordination of actions that may impact adjacent Reliability Coordinator Areas, to support Interconnection reliability. These Operating Procedures, Operating Processes, or Operating Plans shall include, but are not limited to, the following:</p>	

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	<p>1.1. Criteria and processes for notifications.</p> <p>1.2. Energy and capacity shortages.</p> <p>1.3. Control of voltage, including the coordination of reactive resources.</p> <p>1.4. Exchange of information including planned and unplanned outage information to support its Operational Planning Analyses and Real-time Assessments.</p> <p>1.5. Provisions for periodic communications to support reliable operations.</p>	
<p><u>FAC-014-2, Requirement R5, R5.2</u></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>	<p>1. FAC-014-3, Requirement R3</p> <p>2. MOD-028-2, Requirement R7</p> <p>3. MOD-029-2a, Requirement R4</p> <p>4. MOD-030-3, Requirement R2.6</p> <p><u>FAC-014-3, Requirement R3</u></p> <p>R3. The Transmission Operator shall provide its SOLs to its Reliability Coordinator.</p> <p><u>MOD-028-2, Requirement R7:</u></p> <p>R7. The Transmission Operator shall provide the Transmission Service Provider of that ATC Path with the most current value for TTC for that ATC Path no more than:</p>	<p>The communication of SOLs from the TOP to its RC is preserved in FAC-014-3, Requirement R3.</p> <p>The Transmission Service Provider (TSP) was removed from the SOL communication chain because the TSP does not need SOLs to perform its obligations specified in the Modeling, Data, and Analysis (MOD) standards; rather, they need Total Transfer Capability (TTC) and Total Flowgate Capability (TFC) from the TOPs as required in Requirement R7 of MOD-028-</p>

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	<p>R7.1. One calendar day after its determination for TTCs used in hourly and daily ATC calculations.</p> <p>R7.2. Seven calendar days after its determination for TTCs used in monthly ATC calculations.</p> <p><u>MOD-029-2a, Requirement R4:</u></p> <p>R4. Within seven calendar days of the finalization of the study report, the Transmission Operator shall make available to the Transmission Service Provider of the ATC Path, the most current value for TTC and the TTC study report documenting the assumptions used and steps taken in determining the current value for TTC for that ATC Path.</p> <p><u>MOD-030-3, Requirement R2.6:</u></p> <p>[The TOP shall...] R2.6. Provide the Transmission Service Provider with the TFCs within seven calendar days of their establishment.</p>	<p>2, Requirement R4 of MOD-029-2a, and Requirement R2.6 of MOD-030-3. The TTCs and TFCs provided to the TSPs already reflect the impact of any SOLs.</p>
<p><u>FAC-014-2, Requirement R5, R5.3 and R5.4</u></p> <p>R5.3 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</p>	<ol style="list-style-type: none"> <li>1. FAC-014-3, Requirements R7</li> <li>2. MOD-028-2, Requirement R7</li> <li>3. MOD-029-2a, Requirement R4</li> <li>4. MOD-030-3, Requirement R2</li> <li>5. TPL-001-4, Requirement R8</li> </ol>	<p>Provision of important planning study information to TOPs and RCs is preserved in FAC-014-3, Requirement R7, which requires the PC and TP to annually communicate information for Corrective Action Plans developed to address any instability identified in its Planning</p>

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<p>and Reliability Coordinators that work within its Planning Authority Area.</p> <p>R5.4 The Transmission Planner shall provide its SOLs (including the subset of SOLs that are IROLs) to its Planning Authority, Reliability Coordinators, Transmission Operators, and Transmission Service Providers that work within its Transmission Planning Area and to adjacent Transmission Planners.</p>	<p><u>FAC-014-3 Requirements R7</u> (Also see the translation above for Requirements R3 and R4)</p> <p><b>R7.</b> Each Planning Coordinator and each Transmission Planner shall annually communicate the following information for Corrective Action Plans developed to address any instability identified in its Planning Assessment of the Near-Term Transmission Planning Horizon to each impacted Transmission Operator and Reliability Coordinator. This communication shall include:</p> <p><b>7.1</b> The Corrective Action Plan developed to mitigate the identified instability, including any automatic control or operator-assisted actions (such as Remedial Action Schemes, under voltage load shedding, or any other planned mitigation actions);</p> <p><b>7.2</b> The type of instability addressed by the Corrective Action Plan (e.g. steady-state and/or transient voltage instability, angular instability including generating unit loss of synchronism, or unacceptable damping);</p> <p><b>7.3</b> The associated stability criteria violation requiring the Corrective Action Plan (e.g.</p>	<p>Assessments to each impacted TOP and RC. The subparts of Requirement R7 require the communication of key information that can be useful to the RC and TOP to establish stability limits and IROLs that will ultimately be used in real-time operations.</p> <p>The TSP was removed from the SOL communication chain. The TSP does not need SOLs from the PCs or TPs; rather, TSPs need TTC and TFC from the TOPs as required in Requirement R7 of MOD-028-2, Requirement R4 of MOD-029-2a, and Requirement R2.6 of MOD-030-3. The TTCs and TFCs provided to the TSPs already reflect the impact of any SOLs.</p> <p>TPL-001-4, Requirement R8 requires each PC and TP to distribute its Planning Assessment results to adjacent PCs and adjacent TPs within 90 calendar days of completing its Planning Assessment, and to any functional entity that has a reliability related need and submits a written request for the information within 30 days of such a request.</p>

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	<p>violation of transient voltage response criteria or damping rate criteria);</p> <p><b>7.4</b> The planning event Contingency(ies) associated with the identified instability requiring the Corrective Action Plan;</p> <p><b>7.5</b> The System conditions and Facilities associated with the identified instability requiring the Corrective Action Plan.</p> <p><u>MOD-028-2, Requirement R7:</u></p> <p><b>R7.</b> The Transmission Operator shall provide the Transmission Service Provider of that ATC Path with the most current value for TTC for that ATC Path no more than:</p> <p><b>R7.1.</b> One calendar day after its determination for TTCs used in hourly and daily ATC calculations.</p> <p><b>R7.2.</b> Seven calendar days after its determination for TTCs used in monthly ATC calculations.</p> <p><u>MOD-029-2a, Requirement R4:</u></p> <p><b>R4.</b> Within seven calendar days of the finalization of the study report, the Transmission Operator shall make available to the Transmission Service Provider of the ATC Path, the most current value for TTC and the TTC study report documenting the</p>	<p>With this requirement, any functional entity with a reliability-related need for a PC's or TP's Planning Assessment can obtain that Planning Assessment. Requesting entities are then made aware of any system performance issues identified by these Planning Assessments.</p>

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	<p>assumptions used and steps taken in determining the current value for TTC for that ATC Path.</p> <p><u>MOD-030-3, Requirement R2.6:</u></p> <p><b>R2.6.</b> [The TOP shall...] Provide the Transmission Service Provider with the TFCs within seven calendar days of their establishment.</p> <p><u>TPL-001-4, Requirement R8:</u></p> <p><b>R8.</b> Each Planning Coordinator and Transmission Planner shall distribute its Planning Assessment results to adjacent Planning Coordinators and adjacent Transmission Planners within 90 calendar days of completing its Planning Assessment, and to any functional entity that has a reliability related need and submits a written request for the information within 30 days of such a request.</p> <p><b>8.1.</b> If a recipient of the Planning Assessment results provides documented comments on the results, the respective Planning Coordinator or Transmission Planner shall provide a documented response to that recipient within 90 calendar days of receipt of those comments.</p>	

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<p><u>FAC-014-2, Requirement R6</u></p> <p>R6. The Planning Authority shall identify the subset of multiple contingencies (if any), from Reliability Standard TPL-003 which result in stability limits.</p> <p>R6.1 The Planning Authority shall provide this list of multiple contingencies and the associated stability limits to the Reliability Coordinators that monitor the facilities associated with these contingencies and limits.</p> <p>R6.2 If the Planning Authority does not identify any stability-related multiple contingencies, the Planning Authority shall so notify the Reliability Coordinator.</p>	<p><u>FAC-014-3, Requirement R7</u></p> <p>(See the Translation above for Requirements R5.3 and R5.4 )</p>	<p>FAC-014-3, Requirement R7 covers the content of FAC-014-2, Requirement R6.1 and improves upon it as follows:</p> <ul style="list-style-type: none"> <li>• FAC-014-3, Requirement R7 addresses not only the identification of multiple contingencies that result in stability criteria violation, but also address the key information RCs need to establish stability limits and IROLs used in operations. Unlike FAC-014-2, Requirement R6.1, the FAC-014-3, Requirement R7 ensures the type of instability, the associated stability criteria, the associated planning event contingencies, the associated system conditions &amp; Facilities, and Corrective Action Plans developed for its mitigation are communicated by the PC to the appropriate TOP and RC.</li> <li>• FAC-014-2, Requirement R6, R6.2 is addressed by FAC-014-3, Requirement R7 because all</li> </ul>

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		<p>instances of instability identified by the PC are to be communicated to the impacted TOP and RC. Further, it may be noted that FAC-014-2, Requirement R6, R6.2 is administrative in nature, given that the existing FAC-014-2, Requirement R6, R6.1 and proposed FAC-014-3, Requirement R7 both require communication of a defined set of stability related data. The absence of any communication of stability related data inherently implies the PC has not identified any instability and therefore has nothing to communicate.</p>