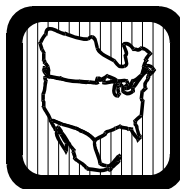


Summary of Comments
for Addressing
Fill-In-The-Blank Aspects of
Reliability Standards

Proposed by the
Regional Reliability Standards
Working Group

October 24, 2006



North American Electric Reliability Council

Standard Number, Name	NERC Requirements for Regional Reliability Organizations to Develop Regional Criteria or Procedures (Enforceable)	Bulk Power System Owner, Operator, or User Requirements to Follow Regional Criteria/Procedures (Conditionally enforceable, excluding requirement to meet specific regional criteria or procedures)	Standards Drafting Team Notes	RRSWG notes and misc. information
BAL-002-0 Disturbance Control Performance	R2. Each Regional Reliability Organization, sub-Regional Reliability Organization or Reserve Sharing Group shall specify its Contingency Reserve policies, including: R 2.1. The minimum reserve requirement for the group. R 2.2. Its allocation among members. R 2.3. The permissible mix of Operating Reserve – Spinning and Operating Reserve – Supplemental that may be included in Contingency Reserve. R 2.4. The procedure for applying Contingency Reserve in practice. R 2.5. The limitations, if any, upon the amount of interruptible load that may be included. R 2.6. The same portion of	R1. Each Balancing Authority shall have access to and/or operate Contingency Reserve to respond to Disturbances. Contingency Reserve may be supplied from generation, controllable load resources, or coordinated adjustments to Interchange Schedules.	<ul style="list-style-type: none"> • <i>modify R2 of the NERC standard to remove reference to "sub-Regional Reliability Organization or Reserve Sharing Group", and</i> • <i>determine what elements of contingency reserve should be included in the North American standard and what elements should be included in the regional standard.</i> <p><i>Additional Notes:</i></p> <ul style="list-style-type: none"> • <i>Development of regional standards needs to be coordinated with Regional entities. Regional entities should begin process for developing regional standards once the drafting team for the North American standard has determined what elements of contingency reserve should be included in</i> 	<ul style="list-style-type: none"> • <i>Regional reliability standards will be developed in support of North American standard BAL-002.</i> • <i>Each RRO will need to create a regional standard specifying their Contingency Reserve policy.</i>

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	resource capacity (e.g. reserves from jointly owned generation) shall not be counted more than once as Contingency Reserve by multiple Balancing Authorities.		<i>the continent-wide standard and what elements should be included in the regional standards.</i>	
EOP-004-0 Disturbance Reporting	R1. Each Regional Reliability Organization shall establish and maintain a regional reporting procedure to facilitate preparation of preliminary and final disturbance reports.	R3.4 If, in the judgment of the Regional Reliability Organization, after consultation with the Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, or Load Serving Entity in which a disturbance occurred, a final report is required, the affected Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, or Load Serving Entity shall prepare this report within 60 days. As a minimum, the final report shall have a discussion of the events and its cause, the conclusions reached, and	<ul style="list-style-type: none"> consider changes to R1 and R3.4 to standardize the disturbance reporting requirements (requirements for disturbance reporting need added to this standard), 	<p><i>Additional Notes:</i></p> <p><i>Regions currently have procedures, but not in the form of a standard. The drafting team will need to review regional requirements to determine reporting requirements for the North American standard.</i></p>

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		<p>recommendations to prevent recurrence of this type of event. The report shall be subject to Regional Reliability Organization approval.</p>		
<p>EOP-005-1 System Restoration Plans</p>		<p>R8. Each Transmission Operator shall verify that the number, size, availability, and location of system blackstart generating units are sufficient to meet Regional Reliability Organization restoration plan requirements for the Transmission Operator's area.</p> <p>R9. The Transmission Operator shall document the Cranking Paths, including initial switching requirements, between each blackstart generating unit and the unit(s) to be started and shall provide this documentation for review by the Regional Reliability Organization upon request. Such documentation may include Cranking Path diagrams.</p> <p>R10. The Transmission Operator shall demonstrate, through</p>	<p><i>Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need modified and EOP-007 needs to be more specific.</i></p>	<p><i>Additional notes: See notes for EOP-007.</i></p>

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		simulation or testing, that the blackstart generating units in its restoration plan can perform their intended functions as required in the regional restoration plan.		
EOP-006-0 Reliability Coordination – System Restoration		R1. Each Reliability Coordinator shall be aware of the restoration plan of each Transmission Operator in its Reliability Coordinator Area in accordance with NERC and regional requirements.	<i>Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need modified and EOP-007 needs to be more specific.</i>	<i>Additional notes: See notes for EOP-007.</i>
EOP-007-0 Establish, Maintain, and Document a Regional Blackstart Capability Plan.	R1. Each Regional Reliability Organization shall establish and maintain a system [Black Start Capability Plan], as part of an overall coordinated Regional System Restoration Plan]. The Regional SRP shall include requirements for verification through analysis how system black start generating units shall perform their intended functions		<i>Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need modified and EOP-007 needs to be more specific.</i>	<i>Additional notes: This is currently a fill-in-the-blank standard tied to EOP-005, EOP-006, and EOP-009; every region should have procedures currently in place required by EOP-007-0; question why this is even an RRO function; they are</i>

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	<p>and shall be sufficient to meet SRP expectations. The Regional Reliability Organization shall coordinate with and among other Regional Reliability Organizations as appropriate in the development of its BCP. The BCP shall include:</p> <p>R 1.1. A requirement to have a database that contains all blackstart generators designated for use in an SRP within the respective areas. This database shall be updated on an annual basis. The database shall include the name, location, megawatt capacity, type of unit, latest date of test, and starting method.</p> <p>R 1.2. A requirement to demonstrate that blackstart units perform their intended functions as required in the</p>			<p><i>not operating entities, should be RCs and operating entities that have the black start plan; black start plans need to be coordinated regionally. Consider to retire EOP-007 and move these elements to EOP-005; EOP-006; and EOP-009. That would remove fill-in-blank elements. Still may need to evaluate role of RRO.</i></p> <p><i>Drafting team should review and upgrade NERC standard. to:</i></p> <ul style="list-style-type: none"> <i>• consider rewording of references in EOP-005, EOP-006, and EOP-009 to RRO/regional requirements and</i> <i>• define the specific requirements for R 1.2, R 1.3, etc. and either</i>

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	<p>Regional SRP. This requirement can be met through either simulation or testing. The BCP must consider the availability of designated BCP units and initial transmission switching requirements.</p> <p>R 1.3. Blackstart unit testing requirements including, but not limited to:</p> <p>R 1.3.1. Testing frequency (minimum of one third of the units each year).</p> <p>R 1.3.2. Type of test required, including the requirement to start when isolated from the system.</p> <p>R 1.3.3. Minimum duration of tests.</p> <p>R 1.4. A requirement to review and update the Regional BCP at least every five years.</p> <p>R2. The Regional Reliability</p>			<p><i>clearly define in EOP-007 or retire EOP-007 and place specific requirements in EOP-005, EOP-006, and EOP-009.</i></p> <p><i>Additionally, consider developing testing requirements on a national basis – this is already well established across the regions. The harder task is isolating the restoration issues in the various standards as described in the EOP-007 write-up to merge into a new NERC standard which then establishes which units are designated Blackstart units. This standard could be written independent of the units' identity and focus on testing of any Blackstart</i></p>

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	Organization shall provide documentation of its system BCPs to NERC within 30 calendar days of a request.			<i>unit.</i>
EOP-009-0 Documentation of Blackstart Generating Unit Test Results		<p>R1. The Generator Operator of each blackstart generating unit shall test the startup and operation of each system blackstart generating unit identified in the BCP as required in the Regional BCP (Reliability Standard EOP-007-0_R1). Testing records shall include the dates of the tests, the duration of the tests, and an indication of whether the tests met Regional BCP requirements.</p> <p>R2. The Generator Owner or Generator Operator shall provide documentation of the test results of the startup and operation of each blackstart generating unit to the Regional Reliability Organizations and upon request to NERC.</p>	<p><i>Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need modified and EOP-007 needs to be more specific.</i></p>	<p><i>See notes for EOP-007.</i></p>

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FAC-001-0 Facility Connection Requirements		<p>R1. The Transmission Owner shall document, maintain, and publish facility connection requirements to ensure compliance with NERC Reliability Standards and applicable Regional Reliability Organization, subregional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements.</p> <p>The Transmission Owner's facility connection requirements shall address connection requirements for:</p> <p>R 1.1. Generation facilities, R 1.2. Transmission facilities, and R 1.3. End-user facilities</p>	<p><i>Remove the phrase "to ensure compliance with NERC Reliability Standards and applicable Regional Reliability Organization, subregional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements".</i></p>	
FAC-002-0 Coordination of Plans For New Generation, Transmission,		<p>R1. The Generator Owner, Transmission Owner, Distribution Provider, and Load-Serving Entity seeking to integrate generation facilities, transmission facilities, and electricity end-user facilities shall each coordinate</p>	<p><i>Modify FAC-002 to:</i></p> <ul style="list-style-type: none"> <i>remove " and applicable Regional, subregional, Power Pool, and individual system planning criteria and facility connection requirements" from R1.2.</i> 	<p><i>Additional notes:</i></p> <ul style="list-style-type: none"> <i>consider removing/modifying R1.4, as it is redundant with the TPL standard,</i> <i>coordinate with FAC-</i>

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and End-User		<p>and cooperate on its assessments with its Transmission Planner and Planning Authority. The assessment shall include:</p> <p>R 1.1. Evaluation of the reliability impact of the new facilities and their connections on the interconnected transmission systems.</p> <p>R 1.2. Ensurance of compliance with NERC Reliability Standards and applicable Regional, subregional, Power Pool, and individual system planning criteria and facility connection requirements.</p> <p>R 1.3. Evidence that the parties involved in the assessment have coordinated and cooperated on the assessment of the reliability impacts of new facilities on the</p>		<p>001, and</p> <ul style="list-style-type: none"> • review FERC rule on interconnecting generators and see what parts impact this standard.

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		<p>interconnected transmission systems. While these studies may be performed independently, the results shall be jointly evaluated and coordinated by the entities involved.</p> <p>R 1.4. Evidence that the assessment included steady-state, short-circuit, and dynamics studies as necessary to evaluate system performance in accordance with Reliability Standard TPL-001-0.</p> <p>R 1.5. Documentation that the assessment included study assumptions, system performance, alternatives considered, and jointly coordinated recommendations.</p>		
FAC-012-1 Transfer		<p>4. Applicability</p> <p>4.1. Reliability Coordinator</p>	<i>Remove "required by its Regional Reliability"</i>	

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Capability Methodology		<p>required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities</p> <p>4.2. Planning Authority required by its Regional Reliability Organization to establish interregional and intra-regional Transfer Capabilities</p>	<p><i>Organization to establish inter-regional and intra-regional Transfer Capabilities “from Applicability section (4.1 and 4.2) of both Fac-012 and FAC-013.</i></p>	
FAC-013-1 Establish and Communicate Transfer Capabilities		<p>4. Applicability</p> <p>4.1. Reliability Coordinator required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities</p> <p>4.2. Planning Authority required by its Regional Reliability Organization to establish interregional and intra-regional Transfer Capabilities</p>	<p><i>Remove “required by its Regional Reliability Organization to establish inter-regional and intra-regional Transfer Capabilities “from Applicability section (4.1 and 4.2) of both Fac-012 and FAC-013.</i></p>	
IRO-001-0	R1. Each Regional Reliability		<ul style="list-style-type: none"> <i>remove ", sub-region, or</i> 	<p><i>Additional notes:</i></p>

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Reliability Coordination – Responsibilities and Authorities	Organization, sub-region, or interregional coordinating group shall establish one or more Reliability Coordinators to continuously assess transmission reliability and coordinate emergency operations among the operating entities within the region and across the regional boundaries.		<i>interregional coordinating group" from R1 and</i>	<i>Consider removing "Standards of conduct are necessary to ensure the Reliability Coordinator does not act in a manner that favors one market participant over another." from the Purpose section of the standard.</i>
MOD-010-0 Steady-State Data for Modeling and Simulation of the Interconnected Transmission System		R1. The Transmission Owners, Transmission Planners Generator Owners, and Resource Planners (specified in the data requirements and reporting procedures of MOD-011-0_R1) shall provide appropriate equipment characteristics, system data, and existing and future Interchange Schedules in compliance with its respective Interconnection Regional steady-state modeling and simulation data requirements and reporting procedures as defined in Reliability Standard MOD-011-	<i>Review MOD-010, MOD-011, Mod-012, and MOD-013 concurrently for modeling requirements and reporting. The drafting team should coordinate the revision of this standard with the revision to MOD-011. MOD-011 needs to be written as a North American standard with requirements for each interconnection. Once MOD-011 is modified, the only changes needed to MOD-010 are the references to the appropriate requirements in MOD-011.</i>	<i>Additional notes: This standard is directly related to MOD-011.</i>

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		<p>0_R 1.</p> <p>R2. The Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners (specified in the data requirements and reporting procedures of MOD-011-0_R1) shall provide this steady-state modeling and simulation data to the Regional Reliability Organizations, NERC, and those entities specified within Reliability Standard MOD-011-0_R 1. If no schedule exists, then these entities shall provide the data on request (30 calendar days).</p>		
<p>MOD-011-0</p> <p>Maintenance and Distribution of Steady-State Data Requirements and Reporting</p>	<p>R1. The Regional Reliability Organizations within an Interconnection, in conjunction with the Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners, shall develop comprehensive steady-state data requirements and reporting procedures needed</p>		<p><i>Review MOD-010, MOD-011, Mod-012, and MOD-013 concurrently for modeling requirements and reporting.</i></p> <p><i>The drafting team should coordinate the revision of this standard with the revision to MOD-011. MOD-011 needs to be written as a North American</i></p>	<p><i>Additional notes:</i></p> <p><i>This should be a North American Standard containing requirements which are interconnection-wide.</i></p> <p><i>MOD-010 and 011 are</i></p>

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Procedures.	<p>to model and analyze the steady-state conditions for each of the NERC Interconnections: Eastern, Western, and ERCOT. Within an Interconnection, the Regional Reliability Organizations shall jointly coordinate the development of the data requirements and reporting procedures for that Interconnection. The Interconnection-wide requirements shall include the following steady-state data requirements:</p> <p>R 1.1. Bus (substation): name, nominal voltage, electrical demand supplied (consistent with the aggregated and dispersed substation demand data supplied per Reliability Standards MOD-016-0, MOD-017-0, and MOD-020-0), and location.</p> <p>R 1.2. Generating Units</p>		<p><i>standard with requirements for each interconnection. Once MOD-011 is modified, the only changes needed to MOD-010 are the references to the appropriate requirements in MOD-011.</i></p>	<p><i>related. This is the MMWG work for the eastern interconnection. Revise NERC MOD-011 to clarify that the data reporting requirements must be uniform across each interconnection.</i></p>

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	<p>(including synchronous condensers, pumped storage, etc.): location, minimum and maximum Ratings (net Real and Reactive Power), regulated bus and voltage set point, and equipment status.</p> <p>R 1.3. AC Transmission Line or Circuit (overhead and underground): nominal voltage, impedance, line charging, Normal and Emergency Ratings (consistent with methodologies defined and Ratings supplied per Reliability Standard FAC-004-0 and FAC-005-0) equipment status, and metering locations.</p> <p>R 1.4. DC Transmission Line (overhead and underground): line parameters, Normal and</p>			

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	<p>R 1.5. Emergency Ratings, control parameters, rectifier data, and inverter data.</p> <p>Transformer (voltage and phase-shifting): nominal voltages of windings, impedance, tap ratios (voltage and/or phase angle or tap step size), regulated bus and voltage set point, Normal and Emergency Ratings (consistent with methodologies defined and Ratings supplied per Reliability Standard FAC-004-0 and FAC-005-0.), and equipment status.</p> <p>R 1.6. Reactive Compensation (shunt and series capacitors and reactors): nominal Ratings, impedance, percent compensation,</p>			

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	<p>connection point, and controller device.</p> <p>R 1.7. Interchange Schedules: Existing and future Interchange Schedules and/or assumptions.</p> <p>R2. The Regional Reliability Organizations within an Interconnection shall document their Interconnection's steady-state data requirements and reporting procedures, shall review those data requirements and reporting procedures (at least every five years), and shall make the data requirements and reporting procedures available on request (within five business days) to Regional Reliability Organizations, NERC, and all users of the interconnected transmission systems.</p>			
<p>MOD-012-0</p> <p>Dynamics Data for Modeling</p>		<p>R1. The Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners (specified in the data</p>	<p><i>Review MOD-010, MOD-011, Mod-012, and MOD-013 concurrently for modeling requirements and reporting.</i></p>	<p><i>Additional notes:</i></p> <p><i>This standard is directly related to MOD-013.</i></p>

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and Simulation of the Interconnected Transmission System		<p>requirements and reporting procedures of MOD-013-0_R4) shall provide appropriate equipment characteristics and system data in compliance with the respective Interconnection-wide Regional dynamics system modeling and simulation data requirements and reporting procedures as defined in Reliability Standard MOD-013-0_R 4.</p> <p>R2. The Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners (specified in the data requirements and reporting procedures of MOD-013-0_R4) shall provide dynamics system modeling and simulation data to its Regional Reliability Organization(s), NERC, and those entities specified within the applicable reporting procedures identified in Reliability Standard MOD-013-0_R 1. If no schedule exists, then these entities shall</p>	<p><i>The drafting team should coordinate the revision of this standard with the revision to MOD-013. MOD-013 needs to be written as a North American standard with requirements for each interconnection. Once MOD-013 is modified, the only changes needed to MOD-012 are the references to the appropriate requirements in MOD-013.</i></p>	

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		provide data on request (30 calendar days).		
<p>MOD-013-0</p> <p>Maintenance and Distribution of Dynamics Data Requirements and Reporting Procedures</p>	<p>R1. The Regional Reliability Organization, in coordination with its Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners, shall develop comprehensive dynamics data requirements and reporting procedures needed to model and analyze the dynamic behavior or response of each of the NERC Interconnections: Eastern, Western, and ERCOT. Within an Interconnection, the Regional Reliability Organizations shall jointly coordinate on the development of the data requirements and reporting procedures for that Interconnection. Each set of Interconnection-wide dynamics data requirements shall include the following dynamics data requirements:</p> <p>R 1.1. Unit-specific dynamics</p>		<p><i>Review MOD-010, MOD-011, Mod-012, and MOD-013 concurrently for modeling requirements and reporting.</i></p> <p><i>Revise NERC MOD-013 to clarify that the data reporting requirements must be uniform across each interconnection.</i></p>	<p><i>Additional notes:</i></p> <p><i>This should be a North American Standard containing requirements which are interconnection-wide.</i></p> <p><i>MOD-012 and 013 are related. This is the MMWG work for the eastern interconnection.</i></p>

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	<p>data shall be reported for generators and synchronous condensers (including, as appropriate to the model, items such as inertia constant, damping coefficient, saturation parameters, and direct and quadrature axes reactances and time constants), excitation systems, voltage regulators, turbine-governor systems, power system stabilizers, and other associated generation equipment.</p> <p>R 1.1.1. Estimated or typical manufacturer's dynamics data, based on units of similar design and characteristics, may be submitted when unit-specific dynamics data</p>			

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	<p>cannot be obtained. In no case shall other than unit-specific data be reported for generator units installed after 1990.</p> <p>R 1.1.2. The Interconnection-wide requirements shall specify unit size thresholds for permitting: The use of non-detailed vs. detailed models; The netting of small generating units with bus load, and; The combining of multiple generating units at one plant</p> <p>R 1.2. Device specific dynamics data shall be reported for dynamic devices, including, among others, static VAR controllers, high voltage direct current systems, flexible AC</p>			

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	<p>transmission systems, and static compensators.</p> <p>R 1.3. Dynamics data representing electrical demand characteristics as a function of frequency and voltage.</p> <p>R 1.4. Dynamics data shall be consistent with the reported steady-state (power flow) data supplied per Reliability Standard MOD-010-0_R 1.</p> <p>R2. The Regional Reliability Organization shall participate in the documentation of its Interconnection's data requirements and reporting procedures and, shall participate in the review of those data requirements and reporting procedures (at least every five years), and shall provide those data requirements and reporting procedures to Regional Reliability Organizations, NERC,</p>			

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	and all users of the Interconnected systems on request (within five business days).			
<p>MOD-016-1</p> <p>Documentation of Data Reporting Requirements for Actual and Forecast Demands, Net Energy for Load, and Controllable Demand-Side Management</p>	<p>R1. The Planning Authority and Regional Reliability Organization shall have documentation identifying the scope and details of the actual and forecast (a) Demand data, (b) Net Energy for Load data, and (c) controllable DSM data to be reported for system modeling and reliability analyses.</p> <p>R 1.1. The aggregated and dispersed data submittal requirements shall ensure that consistent data is supplied for Reliability Standards TPL-005-0, TPL-006-0, MOD-010-0, MOD-011-0, MOD-012-0, MOD-013-0, MOD-014-0, MOD-015-0, MOD-016, MOD-017-</p>		<p><i>Review MOD-016, MOD-017, and MOD-019 concurrently to develop uniform North American standards for reporting of actual and forecast demand and NEL data to be reported to RRO for system modeling and analysis.</i></p>	<p><i>Additional notes:</i></p> <p><i>Standard should address quality and accuracy of the forecast; need to avoid double-counting, etc.</i></p> <p><i>MOD-016 is the NERC requirement on region; MOD-017 and 019 are the entity requirements to comply with region. Includes MOD-016 through MOD-021.</i></p>

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	<p>0, MOD-018-0, MOD-019-0, MOD-020-0, and MOD-021-0.</p> <p>R 1.1. The aggregated and dispersed data submittal requirements shall ensure that consistent data is supplied for Reliability Standards TPL-005-0, TPL-006-0, MOD-010-0, MOD-011-0, MOD-012-0, MOD-013-0, MOD-014-0, MOD-015-0, MOD-016, MOD-017-0, MOD-018-0, MOD-019-0, MOD-020-0, and MOD-021-0.</p> <p>R2. The documentation of the scope and details of the data reporting requirements shall be available on request (five business days).</p>			
MOD-017-0 Aggregated		R1. The Load-Serving Entity, Planning Authority and Resource Planner shall each provide the	<i>Review MOD-016, MOD-017, and MOD-019 concurrently to develop uniform North</i>	<i>Correct reference to MOD-016 when MOD-016 is revised (MOD-016-</i>

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Actual and Forecast Demands and Net Energy for Load		<p>following information annually on an aggregated Regional, subregional, Power Pool, individual system, or Load-Serving Entity basis to NERC, the Regional Reliability Organizations, and any other entities specified by the documentation in Standard MOD-016-0_R 1.</p> <p>R 1.1. Integrated hourly demands in megawatts (MW) for the prior year.</p> <p>R 1.2. Monthly and annual peak hour actual demands in MW and Net Energy for Load in gigawatthours (GWh) for the prior year.</p> <p>R 1.3. Monthly peak hour forecast demands in MW and Net Energy for Load in GWh for the next two years.</p> <p>R 1.4. Annual Peak hour forecast demands (summer and winter) in MW and annual Net</p>	<p><i>American standards for reporting of actual and forecast demand and NEL data to be reported to RRO for system modeling and analysis.</i></p>	<p>1).</p>

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		Energy for load in GWh for at least five years and up to ten years into the future, as requested.		
MOD-019-0 Reporting of Interruptible Demands and Direct Control Load Management		R1. The Load-Serving Entity, Planning Authority, Transmission Planner, and Resource Planner shall each provide annually its forecasts of interruptible demands and Direct Control Load Management (DCLM) data for at least five years and up to ten years into the future, as requested, for summer and winter peak system conditions to NERC, the Regional Reliability Organizations, and other entities (Load-Serving Entities, Planning Authorities, and Resource Planners) as specified by the documentation in Reliability Standard MOD-016-0_R 1.	<i>Review MOD-016, MOD-017, and MOD-019 concurrently to develop uniform North American standards for reporting of actual and forecast demand and NEL data to be reported to RRO for system modeling and analysis.</i>	<i>Additional notes: Correct reference to MOD-016 when MOD-016 is revised (MOD-016-1).</i>
MOD-024-1 Verification of Generator Gross	R1. The Regional Reliability Organization shall establish and maintain procedures to address verification of generator gross and net Real Power capability.	R3. The Generator Owner shall follow its Regional Reliability Organization's procedures for verifying and reporting its gross	<i>Review MOD-024 and MOD-025 concurrently to transition to uniform North American standards.</i>	<i>Additional notes: Goal is uniform North American standards for real and reactive power</i>

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and Net Real Power Capability	<p>These procedures shall include the following:</p> <p>R 1.1. Generating unit exemption criteria including documentation of those units that are exempt from a portion or all of these procedures.</p> <p>R 1.2. Criteria for reporting generating unit auxiliary loads.</p> <p>R 1.3. Acceptable methods for model and data verification, including any applicable conditions under which the data should be verified. Such methods can include use of manufacturer data, commissioning data, performance tracking, and testing, etc.</p> <p>R 1.4. Periodicity and schedule of model and data verification and</p>	and net Real Power generating capability per R1.	<i>Remove the fill-in-the-blank aspects (correct reference to "... Regional Reliability Organization's procedures...").</i>	<i>verification. Look at regional requirements and identify the best practice, commonalities and differences, and whether differences are needed for reliability.</i>

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	<p>reporting.</p> <p>R 1.5. Information to be verified and reported:</p> <p>R 1.5.1. Seasonal gross and net Real Power generating capabilities.</p> <p>R 1.5.2. Real power requirements of auxiliary loads.</p> <p>R 1.5.3. Method of verification, including date and conditions.</p>			
<p>MOD-025-1</p> <p>Verification of Generator Gross and Net Reactive Power Capability</p>	<p>R1. The Regional Reliability Organization shall establish and maintain procedures to address verification of generator gross and net Reactive Power capability. These procedures shall include the following:</p> <p>R 1.1. Generating unit exemption criteria including documentation of those units that are exempt from a portion or all of these procedures.</p> <p>R 1.2. Criteria for reporting</p>	<p>R3. The Generator Owner shall follow its Regional Reliability Organization's procedures for verifying and reporting its gross and net Reactive Power generating capability per R1.</p>	<p><i>Review MOD-024 and MOD-025 concurrently to transition to uniform North American standards.</i></p> <p><i>Remove the fill-in-the-blank aspects (correct reference to "... Regional Reliability Organization's proceduresr...").</i></p>	<p><i>Additional notes:</i></p> <p><i>Refer to MOD-024.</i></p>

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	<p>generating unit auxiliary loads.</p> <p>R 1.3. Acceptable methods for model and data verification, including any applicable conditions under which the data should be verified. Such methods can include use of commissioning data, performance tracking, engineering analysis, testing, etc.</p> <p>R 1.4. Periodicity and schedule of model and data verification and reporting.</p> <p>R 1.5. Information to be reported:</p> <p>R 1.5.1. Verified maximum gross and net Reactive Power capability (both lagging and leading) at Seasonal Real Power generating capabilities as reported in</p>			

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	<p>accordance with Reliability Standard MOD-024 Requirement 1.5.1.</p> <p>R 1.5.2. Verified Reactive Power limitations, such as generator terminal voltage limitations, shorted rotor turns, etc.</p> <p>R 1.5.3. Verified Reactive Power of auxiliary loads.</p> <p>R 1.5.4. Method of verification, including date and conditions.</p>			
<p>PRC-002-1</p> <p>Define and Document Disturbance Monitoring Equipment Requirements.</p>	<p>R1. The Regional Reliability Organization shall develop comprehensive requirements for the installation of disturbance monitoring equipment to ensure data is available to determine system performance and the causes of system disturbances. The comprehensive requirements shall include all of the following:</p> <p>R 1.1. Type of data recording capability (e.g., sequence-of-event, Fault</p>		<ul style="list-style-type: none"> determine what elements (if any) of disturbance monitoring should be included in the North American standard and what elements should be included in the regional standards. <p>Additional notes: Development of regional standards need to be coordinated with Regional</p>	<p>PRC-002 will be a continent-wide standard supported by Regional Reliability Standards.</p> <p>PRC-002 is directly related to PRC-018. PRC-018 requires the functional entities to comply with the requirements developed by each RRO.</p>

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	<p>recording, dynamic Disturbance recording).</p> <p>R 1.2. Equipment characteristics including but not limited to:</p> <p>R 1.2.1. Recording duration requirements.</p> <p>R 1.2.2. Time synchronization requirements.</p> <p>R 1.2.3. Data format requirements.</p> <p>R 1.2.4. Event triggering requirements</p> <p>R 1.3. Monitoring, recording, and reporting capabilities of the equipment.</p> <p>R 1.3.1. Voltage.</p> <p>R 1.3.2. Current.</p> <p>R 1.3.3. Frequency.</p> <p>R 1.3.4. MW and/or MVAR, as appropriate.</p> <p>R 1.4. Data retention capabilities (e.g., length of time data is to be available for retrieval).</p> <p>R 1.5. Regional coverage</p>		<p><i>entities. Regional entities should begin process for developing regional standards once the drafting team for the North American standard has determined what elements of disturbance monitoring should be included in the continent-wide standard and what elements should be included in the regional standards.</i></p>	<p><i>Need regions to develop and submit regional standards. NERC standard requires region to have this done in 9 months from board adoption (from August 9). Regions need to do this as a regional standard, not a procedure or some other document.</i></p>

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	<p>requirements (e.g., by voltage, geographic area, electric area or subarea).</p> <p>R 1.6. Installation requirements:</p> <p>R 1.6.1. Substations.</p> <p>R 1.6.2. Transmission lines.</p> <p>R 1.6.3. Generators.</p> <p>R 1.7. Responsibility for maintenance and testing.</p> <p>R 1.8. Requirements for periodic (at least every five years) updating, review, and approval of the Regional requirements.</p> <p>R2. The Regional Reliability Organization shall provide its requirements for the installation of disturbance monitoring equipment to other Regional Reliability Organizations and NERC on request (30 calendar days).</p>			

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PRC-003-1 Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems	R1. Each Regional Reliability Organization shall establish, document and maintain its procedures for, review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations. These procedures shall include the following elements: R 1.1 The Protection Systems to be reviewed and analyzed for Misoperations (due to their potential impact on BES reliability). R 1.2. Data reporting requirements (periodicity and format) for Misoperations. R 1.3. Process for review, analysis follow up, and documentation of Corrective Action Plans for Misoperations. R 1.4. Identification of the Regional Reliability Organization group		<i>Review PRC-003 and PRC-004 together to identify the specific requirements of the functional entities (include specific requirements for each functional entity).</i>	<i>Additional notes: This is a North American Standard as written which places requirements on the regions to develop a procedure. However, PRC-004 requires functional entities to comply with the procedures the RROs develop. Craft a new PRC-003 as a North American standard containing the specific requirements for each functional entity. Modify PRC-003 to include specific requirements for each functional entity. Each of the regional plans needs to be reviewed to determine what should be included in the North American standard. The</i>

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	<p>responsible for the procedures and the process for approval of the procedures.</p> <p>R2. Each Regional Reliability Organization shall maintain and periodically update documentation of its procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations.</p> <p>R3. Each Regional Reliability Organization shall distribute procedures in Requirement 1 and any changes to those procedures, to the affected Transmission Owners, Distribution Providers that own transmission Protection Systems, and Generator Owners within 30 calendar days of approval of those procedures.</p>			<p>current PRC-003 defines requirements for RROs. The drafting team should revise PRC-004 to include proper references to the new PRC-003.</p>
<p>PRC-004-1</p> <p>Analysis and Mitigation of</p>		<p>R1. The Transmission Owner and any Distribution Provider that owns a transmission Protection System shall each analyze its transmission Protection System</p>	<p>Review PRC-003 and PRC-004 together to identify the specific requirements of the functional entities.</p>	<p>Additional notes: See notes for PRC-003-1.</p> <p>Drafting team should coordinate the revision of</p>

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Transmission and Generation Protection System Misoperations		<p>Misoperations and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for Reliability Standard PRC-003 Requirement 1.</p> <p>R2. The Generator Owner shall analyze its generator Protection System Misoperations, and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for PRC-003 R1.</p> <p>R3. The Transmission Owner, any Distribution Provider that owns a transmission Protection System, and the Generator Owner shall each provide to its Regional Reliability Organization, documentation of its Misoperations analyses and</p>		<p><i>this standard with the revision to standard PRC-003. PRC-003 needs to be written as a North American standard with requirements for each functional entity as appropriate. Once PRC-003 is modified, the only changes needed to PRC-004 are the references to the appropriate requirements in PRC-003.</i></p>

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		Corrective Action Plans according to the Regional Reliability Organization's procedures developed for PRC-003 R1.		
PRC-006-0 Development and Documentation of Regional Reliability Organizations' Underfrequency Load Shedding Programs	R1. Each Regional Reliability Organization shall develop, coordinate, and document an [Under-Frequency Load Shedding] program, which shall include the following: R 1.1. Requirements for coordination of UFLS programs within the subregions, Regional Reliability Organization and, where appropriate, among Regional Reliability Organizations. R 1.2. Design details shall include, but are not limited to: R 1.2.1. Frequency set points. R 1.2.2. Size of corresponding load shedding blocks (% of connected loads.)		<ul style="list-style-type: none"> • modify R1 to require each Region to develop a regional standard, and • determine what elements (if any) of UFLS should be included in the North American standard and what elements should be included in the regional standards. <p><i>Additional notes:</i> Development of regional standards needs to be coordinated with Regional entities. Regional entities should begin process for developing regional standards once the drafting team for the North American standard has determined what elements of UFLS should be included in the</p>	<p><i>PRC-006 will be a continent-wide standard supported by Regional Reliability Standards.</i></p> <p><i>Related PRC-007, PRC-008, and 009.</i></p>

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	<p>R 1.2.3. Intentional and total tripping time delays.</p> <p>R 1.2.4. Generation protection.</p> <p>R 1.2.5. Tie tripping schemes.</p> <p>R 1.2.6. Islanding schemes.</p> <p>R 1.2.7. Automatic load restoration schemes.</p> <p>R 1.2.8. Any other schemes that are part of or impact the UFLS programs.</p> <p>R 1.3. A Regional Reliability Organization UFLS program database. This database shall be updated as specified in the Regional Reliability Organization program (but at least every five years) and shall include sufficient information to model the UFLS program in dynamic simulations of the interconnected transmission systems.</p> <p>R 1.4. Assessment and documentation of the</p>		<p><i>continent-wide standard and what elements should be included in the regional standards.</i></p>	

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	<p>effectiveness of the design and implementation of the Regional UFLS program. This assessment shall be conducted periodically and shall (at least every five years or as required by changes in system conditions) include, but not be limited to:</p> <p>R 1.4.1. A review of the frequency set points and timing, and</p> <p>R 1.4.2. Dynamic simulation of possible Disturbance that cause the Region or portions of the Region to experience the largest imbalance between Demand (Load) and generation.</p> <p>R2. The Regional Reliability Organization shall provide documentation of its UFLS program and its database</p>			

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	<p>information to NERC on request (within 30 calendar days).</p> <p>R3. The Regional Reliability Organization shall provide documentation of the assessment of its UFLS program to NERC on request (within 30 calendar days).</p>			
<p>PRC-007-0</p> <p>Assuring Consistency of Entity Underfrequency Load Shedding Programs with Regional Reliability Organization's Underfrequency Load Shedding Program Requirements</p>		<p>R1. The Transmission Owner and Distribution Provider, with a UFLS program (as required by its Regional Reliability Organization) shall ensure that its UFLS program is consistent with its Regional Reliability Organization's UFLS program requirements.</p> <p>R2. The Transmission Owner, Transmission Operator, Distribution Provider, and Load-Serving Entity that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide, and annually update, its underfrequency data as necessary for its Regional Reliability</p>	<p><i>Change "program" to "standard" in R1.</i></p>	<p><i>Additional notes:</i></p> <p><i>Coordinated with PRC-006.</i></p> <p><i>The regional procedures need converted to a standard to implement this.</i></p>

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		<p>Organization to maintain and update a UFLS program database.</p> <p>R3. The Transmission Owner and Distribution Provider that owns a UFLS program (as required by its Regional Reliability Organization) shall provide its documentation of that UFLS program to its Regional Reliability Organization on request (30 calendar days).</p>		
<p>PRC-009-0</p> <p>Analysis and Documentation of Underfrequency Load Shedding Performance Following an Underfrequency Event</p>		<p>R1. The Transmission Owner, Transmission Operator, Load-Serving Entity and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall analyze and document its UFLS program performance in accordance with its Regional Reliability Organization's UFLS program.</p> <p>The analysis shall address the performance of UFLS equipment and program effectiveness following system events resulting</p>	<p>Change "program" to "standard".</p>	<p>Additional notes: See notes for PRC-007.</p>

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		<p>in system frequency excursions below the initializing set points of the UFLS program. The analysis shall include, but not be limited to:</p> <p>R 1.1. A description of the event including initiating conditions.</p> <p>R 1.2. A review of the UFLS set points and tripping times.</p> <p>R 1.3. A simulation of the event.</p> <p>R 1.4. A summary of the findings.</p> <p>R2. The Transmission Owner, Transmission Operator, Load-Serving Entity, and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide documentation of the analysis of the UFLS program to its Regional Reliability Organization and NERC on request 90 calendar</p>		

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		days after the system event.		
PRC-012-0 Special Protection System Review Procedure	R1 Each Regional Reliability Organization with a Transmission Owner, Generator Owner, or Distribution Providers that uses or is planning to use an SPS shall have a documented Regional Reliability Organization SPS review procedure to ensure that SPSs comply with Regional criteria and NERC Reliability Standards. The Regional SPS review procedure shall include: R 1.1. Description of the process for submitting a proposed SPS for Regional Reliability Organization review. R 1.2. Requirements to provide data that describes design, operation, and modeling of an SPS. R 1.3. Requirements to demonstrate that the SPS shall be designed so that a single SPS		<i>Review PRC-012 and PRC-016 together to properly reference regional standards.</i> <ul style="list-style-type: none"> • <i>modify R1 to require each Region to have a regional standard, and</i> • <i>identify what elements (if any) of SPS schemes should be included in the North American standard and what elements should be included in the regional standards.</i> <i>Additional notes:</i> <i>Development of regional standards needs to be coordinated with Regional entities. Regional entities should begin process for developing regional standards once the drafting team for the North American standard has determined what elements of</i>	<i>PRC-012 will be a continent-wide standard supported by Regional Reliability Standards.</i> <i>PRC-012 is related to PRC- 016. Justified as regional standard; network specific.</i> <i>Consider to remove R1.6 and capitalize "Misoperation" in the current R1.7 as "misoperation" has been added to the glossary of the standards manual. Also consider: R1 needs changed to state Regional Standard instead of Regional criteria (once they become standards).</i> <i>Drafting team should</i>

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	<p>component failure, when the SPS was intended to operate, does not prevent the interconnected transmission system from meeting the performance requirements defined in Reliability Standards TPL-001-0, TPL-002-0, and TPL-003-0.</p> <p>R 1.4. Requirements to demonstrate that the inadvertent operation of an SPS shall meet the same performance requirement (TPL-001-0, TPL-002-0, and TPL-003-0) as that required of the contingency for which it was designed, and not exceed TPL-003-0.</p> <p>R 1.5. Requirements to demonstrate the proposed SPS will</p>		<p><i>SPS schemes should be included in the continent-wide standard and what elements should be included in the regional standards.</i></p>	<p><i>consider removing R1.2 from PRC-012-0 (see notes for PRC-015 for additional details. Also, review revisions PRC-013 and PRC-015 to make sure data requirements have been addressed adequately in PRC-013 and PRC-015 such that R1.2 of PRC-012 can be removed).</i></p>

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	<p>coordinate with other protection and control systems and applicable Regional Reliability Organization Emergency procedures.</p> <p>R 1.6. Regional Reliability Organization definition of misoperation.</p> <p>R 1.7. Requirements for analysis and documentation of corrective action plans for all SPS misoperations.</p> <p>R 1.8. Identification of the Regional Reliability Organization group responsible for the Regional Reliability Organization's review procedure and the process for Regional Reliability Organization approval of the procedure.</p> <p>R 1.9. Determination, as</p>			

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	<p>appropriate, of maintenance and testing requirements.</p> <p>R2. The Regional Reliability Organization shall provide affected Regional Reliability Organizations and NERC with documentation of its SPS review procedure on request (within 30 calendar days).</p>			
<p>PRC-013-0</p> <p>Special Protection System Database</p>	<p>The Regional Reliability Organization that has a Transmission Owner, Generator Owner, or Distribution Provider with an SPS installed shall maintain an SPS database. The database shall include the following types of information:</p> <p>R 1.1. Design Objectives — Contingencies and system conditions for which the SPS was designed,</p> <p>R 1.2. Operation — The actions taken by the SPS in response to</p>		<p><i>Review PRC-013 and PRC-015 together to properly reference regional standards (see notes of PRC-015 for options).</i></p>	<p><i>Additional notes: Related to PRC-015.</i></p>

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	<p>Disturbance conditions, and</p> <p>R 1.3. Modeling — Information on detection logic or relay settings that control operation of the SPS.</p> <p>R2. The Regional Reliability Organization shall provide to affected Regional Reliability Organization(s) and NERC documentation of its database or the information therein on request (within 30 calendar days).</p>			
<p>PRC-015-0</p> <p>Special Protection System Data and Documentation</p>		<p>R1. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall maintain a list of and provide data for existing and proposed SPSs as specified in Reliability Standard PRC-013-0_R 1.</p> <p>R2. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall have evidence it</p>	<p><i>Review PRC-013 and PRC-015 together to properly reference regional standards (see notes of PRC-015 for options).</i></p>	<p><i>Additional notes: Tied to PRC-013.</i></p> <p><i>Drafting team should consider affect of removing R1.2 from PRC-012-0 and revision of PRC-013-0, R1.1, 1.2, & 1.3 to include a specific list of items to be included in the RRO SPS database.</i></p>

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		<p>reviewed new or functionally modified SPSs in accordance with the Regional Reliability Organization's procedures as defined in Reliability Standard PRC-012-0_R1 prior to being placed in service.</p> <p>R3. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall provide documentation of SPS data and the results of Studies that show compliance of new or functionally modified SPSs with NERC Reliability Standards and Regional Reliability Organization criteria to affected Regional Reliability Organizations and NERC on request (within 30 calendar days).</p>		<p><i>The same list should either be added to PRC-015, R1.1. However, it may be cleaner to move PRC-015-0, R1.1 and the data portion of R1.3 to PRC-013. (Note: revisions to PRC-012 are identified for a separate drafting team and are expected to take place after revisions to PRC-013 and PRC-015 are completed.)</i></p>
<p>PRC-016-0</p> <p>Special Protection System</p>		<p>R1. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall analyze its SPS operations and maintain a record</p>	<p><i>Review PRC-012 and PRC-016 together to properly reference regional standards (see notes of PRC-015 for options).</i></p>	<p><i>Additional notes: Tied to PRC-012.</i></p>

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Misoperations		<p>of all misoperations in accordance with the Regional SPS review procedure specified in Reliability Standard PRC-012-0_R 1.</p> <p>R2. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall take corrective actions to avoid future misoperations.</p> <p>R3. The Transmission Owner, Generator Owner, and Distribution Provider that owns an SPS shall provide documentation of the misoperation analyses and the corrective action plans to its Regional Reliability Organization and NERC on request (within 90 calendar days).</p>		
TOP-002-0 Normal Operations Planning		R6. Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency	<i>Remove "in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements" from R6 and "in accordance with filed tariffs and/or</i>	

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		<p>planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.</p> <p>R12. The Transmission Service Provider shall include known SOLs or IROLs within its area and neighboring areas in the determination of transfer capabilities, in accordance with filed tariffs and/or regional Total Transfer Capability and Available Transfer Capability calculation processes.</p>	<p><i>regional Total Transfer Capability and Available Transfer Capability calculation processes" from R12 .</i></p>	

Attachment 1
(RRSWG Roster)

Regional Reliability Standards Working Group

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