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Response to the “Arizona-Southern California Outages on September 8, 2011” Report

By

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Western Electricity Coordinating Council

September 28, 2012

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1 Executive Summary

This Response Report by the Western Electricity Coordinating Council (WECC) has been prepared in response to the North American Electric Reliability Corporation (NERC) and the Federal Energy Regulatory Commission (FERC) Report on the [Arizona-Southern California Outages on September 8, 2011](#) (Joint Report) published May 1, 2012. This Response Report lists activities completed or underway in response to the 27 findings identified in the Joint Report ([Table 4](#)). In addition it provides activities that address the eight additional systemic concerns described in a letter dated July 26, 2012 from Gerry Cauley, NERC President and CEO, to Mark Maher, WECC CEO ([Table 5](#)).

WECC and its member utilities are committed to reliability and have been working diligently since the event and the issuance of the Joint Report to address the underlying issues and the specific recommendations contained therein. Significant progress has already been made in many areas. There are 51 WECC activities and 69 member activities currently underway, all with defined timelines that reflect a sense of urgency. However, while WECC recognizes the need to resolve these issues expeditiously it must ensure that well-reasoned, technically sound actions are not compromised in the interest of time. Consequently, the timeframe for completion of the activities ranges from 2011 – 2015.

The WECC activities that address the recommendations and the systemic concerns are divided into four main sets: Organization¹ (ORG), Reliability Coordinator (RC), Operations and Planning (O&P), and Compliance (CPL). The most significant activity in the ORG area is a strategic planning process that is proposing future options for the structure, governance, and funding mechanism(s) of WECC. Other organizational activities include reviewing data sharing, reviewing standards, the creation of a Vice President of Reliability Coordination position, and the consideration of creative ways to ensure sufficient, qualified staff resources.

The most significant RC activity currently underway is the work of the RC Task Force (RCTF); a task force created at the direction of the WECC Board of Directors (Board). The purpose of the RCTF is to evaluate staffing, tools, and training to determine effectiveness; and to develop recommendations for changes necessary to fulfill WECC's

¹ Activities undertaken by WECC's management and Board.

mission. Additional RC activities include improving processes and tools, facilitating greater data sharing, and increasing staffing.

The O&P activities include developing processes and guidelines to help facilitate consistency and coordination among entities in the planning and operations horizons. These activities also include reviewing the role and coverage of the Planning Coordinator and improving the WECC base cases to provide high-quality data to the membership.

The focus of the Joint Report and this Response Report is not on compliance with mandatory standards. However, there are some activities that WECC's Compliance group is undertaking to improve the ability of the Compliance Monitoring and Enforcement Program to help address reliability concerns. These include adding standards to the audit scope, documenting "areas of concern" in audit reports, discussing high-level trends and issues with the RC, and coordinating with NERC to improve processes.

Additionally, seven member utilities have provided WECC with 69 activities that they are currently performing as a result of the event and the Joint Report. These activities indicate that several members are improving visibility of external and sub-100-kV elements in their models, improving sharing of data, implementing state estimators and real-time contingency analysis, and generally reviewing and improving processes and practices.

WECC also recognizes that there are several issues identified in the Joint Report that transcend the Western Interconnection and may be relevant to entities continent-wide. Consequently, WECC has identified 12 issues where, in WECC's opinion, NERC should take the lead. WECC is committed to participate and coordinate with NERC on all such actions.

While several issues identified in the Joint Report required compliance with associated mandatory reliability standards, the focus of this Response Report is on reliability. Taking this into consideration, WECC strongly encourages Registered Entities to review their systems, practices, and processes not only for compliance with the language of the requirement, but also for the intent of the standards, and the best interest of the reliability of the Interconnection.

WECC commends the commitment of its membership and Registered Entities to improving reliability and addressing the recommendations of the Joint Report.

2 Background

The Joint Report identified 27 findings and recommendations relating to situational awareness; next-day planning; seasonal planning; near- and long-term planning; impact of sub-100-kV facilities; and Interconnection Reliability Operating Limits (IROL). Many of

these recommendations affect not only the Registered Entities that were involved in the event, but extend to all Registered Entities across the continent.

On June 5, 2012, WECC received a letter from David Nevius, Senior Vice President of NERC, asking follow-up questions associated with the 27 recommendations from the Joint Report. Using these questions as a basis, on June 11, 2012 WECC issued a [survey](#) to Transmission Operators (TOP), Planning Coordinators (PC), Transmission Planners (TP), Generator Owners (GO), and Generator Operators (GOP) to assess the overall practices of entities in the Western Interconnection and identify any reliability gaps and best practices. On July 20, 2012, WECC posted a high-level [summary](#) of the survey results on its website.

On July 26, 2012, WECC received a [letter](#) from Gerry Cauley in which he reinforced the importance of the recommendations from the Joint Report and identified an additional eight systemic concerns. In his letter, Mr. Cauley requested that WECC provide a comprehensive Response Report outlining near-term remediation actions completed or in progress to date, and plans for additional actions.

WECC and NERC subsequently agreed that WECC would send a [Preliminary Response Report](#) to NERC for comment on August 31, 2012 with an updated Response Report posted by WECC on September 30, 2012. WECC received comments from NERC on September 14, 2012 that are addressed in this version.

3 Activities

Many of the activities underway at WECC and the Registered Entities in the Western Interconnection address the multiple recommendations and systemic concerns. As such, Sections 3.1 and 3.2 of this Response Report are laid out to identify all activities currently underway. In addition, WECC and its stakeholders have identified that some of the recommendations have ramifications for the entire North American Bulk Electric System (BES) and believe that these should be addressed by NERC. Although WECC is taking action on all recommendations, Section 3.3 identifies the areas that WECC believes should be addressed by NERC. To avoid any duplication of effort, WECC proposes to coordinate with NERC on all of these continent-wide issues.

Collectively, the activities in Sections 3.1 to 3.3 address the recommendations from the Joint Report and the systemic concerns identified in Mr. Cauley's letter. Section 3.4 cross-references the activities listed in Sections 3.1 to 3.3, to the recommendations from the Joint Report and the systemic concerns identified in Mr. Cauley's letter.

3.1 WECC Activities

[Table 1](#) provides a summary of all of the WECC activities completed, underway, and planned that are related to the event on September 8, 2011. These activities are being performed by WECC staff, committees, and the WECC Board.

Activity Legend: ORG WECC Management and Board
 RC Reliability Coordinator Staff
 O&P Operations and Planning Staff
 CPL Compliance Staff

Table 1: WECC Activities			
	Activity	Status	Estimated Completion Date
Organizational (ORG) Activities			
ORG1	Examination of potential Structural and Governance Changes	In Progress	June 27, 2013
ORG2	WECC review of all Data Sharing Practices/ Policies/Agreements	In Progress	March 30, 2013
ORG3	Summer Preparedness Meeting with executives of Arizona and Southern California Entities	COMPLETE	August 30, 2012
ORG4	Create new position for Vice President of Reliability Coordination.	COMPLETE	May 21, 2012
ORG5	Review of Standards for Areas of Improvement	In Progress	December 31, 2012
ORG6	Human Resource Development	In Progress	December 31, 2013
ORG7	Provide education on Path Rating Process	In Progress	December 31, 2012
Reliability Coordinator (RC) Activities			
RC1	Share Next-Day Studies	COMPLETE	August 23, 2012
RC2	Signatories of Universal Non-Disclosure Agreement	In Progress	December 31, 2012
RC3	Sub-100-kV Facility Identification	In Progress	June 28, 2013
RC4	Share Outage Data with TOPs	COMPLETE	August 23, 2012

Table 1: WECC Activities			
	Activity	Status	Estimated Completion Date
RC5	Share RC State Estimator and Real-Time Contingency Analysis (RTCA) with TOPs	Not yet started	To be determined
RC6	Enhanced System Operating Limit (SOL) Methodology – Phase I	COMPLETE	June 4, 2012
RC7	Enhanced SOL Methodology – Phase II	In Progress	June 30, 2013
RC8	RC Task Force Evaluation	In Progress	December 31, 2014
RC9	Improve RC Forecasted Interchange	In Progress	December 31, 2013
RC10	Additional formats of Next-Day Studies	In Progress	October 12, 2012
RC11	Defined roles and responsibilities in SOL Exceedances	In Progress	June 28, 2013
RC12	SOL Reporting Tools	In Progress	December 31, 2012
RC13	Loss of Real-time Tools Notification	In Progress	October 31, 2012
RC14	RC Phase Angle Tools	In Progress	September 30, 2013
RC15	Coachella Valley Transformers in RTCA	COMPLETE	September 16, 2011
RC16	2013 Headcount	In Progress	December 31, 2013
RC17	Revise Internal Operating Procedures	In Progress	November 12, 2012
RC18	Real-time ICCP Data Hub	In Progress	March 1, 2013
Operations and Planning (O&P) Activities			
O&P1	Survey of Western Interconnection Practices	In Progress	October 31, 2012
O&P2	Best Practices for Next-Day Studies	In Progress	January 31, 2013
O&P3	Consistent Mechanism for Seasonal Planning	In Progress	June 1, 2014
O&P4	Ensure Coverage of PCs	In Progress	December 31, 2013

Table 1: WECC Activities			
	Activity	Status	Estimated Completion Date
O&P5	Model Relays and RAS in Base Cases	In Progress	December 31, 2015
O&P6	RASRS review additional Tie-line Schemes and Safety Nets	In Progress	November 29, 2012
O&P7	Coordination of Transmission Planning Assessments	In Progress	June 30, 2013
O&P8	Base Case Coordination System	In Progress	July 31, 2013
O&P9	Relay Operations Guideline	In Progress	January 31, 2013
O&P10	Benchmark TP Models Against September 8 Event	In Progress	December 31, 2013
O&P11	Sharing Real-Time Data among TOPs	In Progress	January 31, 2013
O&P12	Distribute the NERC Real-Time Tools Best Practices Task Force Report (RTTBPTF).	COMPLETE	August 24, 2012
O&P13	Develop Real-Time Tools Guideline	In Progress	January 31, 2013
O&P14	Real-Time Tools Training Guideline	In Progress	January 31, 2013
O&P15	Address discrepancies between Planning and Operations Models	In Progress	June 30, 2014
O&P16	Guideline on sub-100-kV Elements in Models	In Progress	October 31, 2013
O&P17	Comprehensive Review of RAS	In Progress	November 28, 2012
O&P18	Guideline on Post-Contingent Plans	In Progress	January 31, 2013
O&P19	White Paper on Generator Acceleration Controls	In Progress	June 30, 2014
O&P20	Generator Tripping in Base Cases	In Progress	October 12, 2012
O&P21	Review of Elements to add to BES	In Progress	January 31, 2014
O&P22	Consider Real-Time Digital Simulation	In Progress	June 30, 2013

Table 1: WECC Activities			
	Activity	Status	Estimated Completion Date
Compliance (CPL) Activities			
CPL1	Add Standards to Audit Scope	COMPLETE	May 29, 2012
CPL2	Add "Areas of Concern" to Audit Reports	COMPLETE	September 24, 2012
CPL3	Meetings between Compliance and the RC	In Progress	October 31, 2012
CPL4	Coordinate with NERC on Issues	In Progress	February 28, 2013

3.1.1 Examination of Potential Organizational and Governance Changes (ORG1)

The Board annually undertakes a strategic planning session at its September meeting. Subsequent to the 2011 strategic planning session; the WECC Board, with input from WECC senior management, developed a revised Three-to-Five Year Strategic Plan that identifies mission and vision statements focusing on WECC's reliability role in the Western Interconnection. The Board approved the revised plan at its December 2011 meeting.

WECC's mission is to promote and foster a reliable and efficient Bulk Electric System. As WECC carries out this mission, it aspires to lead stakeholders in the Western Interconnection to achieve optimal system reliability, be the premier source of unbiased information, and serve as the trusted thought leader for the Western Interconnection.

WECC was formed in 2002 in anticipation of mandatory standards and was structured to maintain a trade association framework and governance. Since then, WECC's role and scope of activities has grown with the introduction of mandatory reliability standards in 2007 and in 2009, with the assumption of the Reliability Coordinator function for the Western Interconnection.

In addition, subsequent to the 2011 strategic planning session, several challenges to WECC's reliability mission have been identified and, as a result, the September 6-7, 2012 planning session considered the future structure, governance, and funding mechanism(s) of WECC.

PROJECT SCOPE

Phase I: (July – September):

1. Identify challenges
2. Identify options for:
 - a. Structure
 - b. Governance
 - c. Funding mechanism(s)
3. Board decision on recommended options

Phase II: (September – December)

1. Three-year budget assessment for the recommended organization and associated governance and funding mechanism(s)
2. Additional governance considerations (e.g., Bylaws)

At the September 6-7 strategic planning session, the Board passed [four resolutions](#) regarding the future structure, governance, and funding of WECC.

These resolutions included:

1. pursuing bifurcation into two companies (one Regional Entity and one Non-Regional Entity);
2. developing a governance model with an independent board and strong member advisory committee for the Regional Entity;
3. developing a governance model with a small hybrid board for the Non-Regional Entity; and
4. developing a funding mechanism including continuation of Federal Power Act Section 215 funding for the Regional Entity and a tariff for the Non-Regional Entity.

Materials developed pursuant to these resolutions will be presented to the December 2012 Board meeting.

Milestone	Status	Expected Completion Date
Draft strategic planning slides posted for stakeholder comment	COMPLETE	August 8, 2012
Draft strategic planning white paper posted	COMPLETE	August 24, 2012
Informational Webinar	COMPLETE	August 29, 2012
Strategic Planning Session Phase I	COMPLETE	September 6-7, 2012
Develop Phase II materials	In Progress	November 28, 2012
Strategic Planning Session Phase II	Scheduled	December 5-7, 2012
Develop any additional materials	Not Started	May 28, 2013
Annual Membership Meeting and vote	Scheduled	June 27, 2013

3.1.2 WECC Review of all Data Sharing Practices/Policies/Agreements (ORG2)

WECC is reviewing all relevant data sharing practices, policies, and agreements, including, but not limited to:

- [Data Information Availability Policy](#)
- [Reliability Information Sharing Policy](#)
- [Universal Non-Disclosure Agreement](#)
- [WECC Policy for WECC Reliability Coordinator \(RC\) Data Request](#)
- [Guideline for Reliability Coordinator \(RC\) Data Requests](#)
- [Criteria for Physical Connection to the WECC Operations Network](#)

The initial stage of the review will include a legal summary of the purpose and scope of each of the documents. The second stage will be a review by technical staff of whether there are duplications or gaps in coverage. Once the review is complete, there will be a discussion of next steps.

Milestone	Status	Expected Completion Date
Legal Review of existing policies	COMPLETE	August 23, 2012
Technical review of existing policies	In Progress	December 31, 2012
Development of next steps and recommendations	Not Started	March 30, 2013

3.1.3 Summer Preparedness Meeting with Executives of Arizona and Southern California Entities (ORG3)

Prior to the summer operating season, WECC convened a meeting of operational leadership from the entities responsible for serving critical loads and operating transmission facilities in the Pacific Southwest. The entities in attendance were Arizona Public Service Company (APS), California Independent System Operator (CAISO), Comisión Federal de Electricidad (CFE), Imperial Irrigation District (IID), Los Angeles Department of Water and Power (LADWP), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), Western Area Power Administration (WAPA), and WECC.

The purpose of the meeting was to collaborate and address any necessary actions required to assure the reliability of the BES in the Western Interconnection during the summer 2012 season and beyond. The meeting provided the opportunity for the group

to better understand the roles and responsibilities of the WECC RC function, Balancing Authorities (BA), Transmission Owners (TO) and Transmission Operators (TOP).

A follow up meeting was held on August 30, 2012 to discuss lessons learned and assess the summer operating season. The general consensus was that coordination and communication have improved. There was continuing discussion regarding clarifying the role of the Path Operator, including the potential to implement contractual relationships. There was also discussion about ways to use tools such as RTCA to improve accuracy of system operating limits, rather than relying solely on conservative nomograms in real-time. There is executive support to continue this series of meetings and hold a summer preparedness meeting in spring 2013.

Arizona Public Service (APS) will facilitate further discussions to identify the issues with the Path Operator roles, responsibilities, and authorities. APS anticipates hosting the first discussion in October.

Milestone	Status	Expected Completion Date
Summer preparedness meeting	COMPLETE	May 31, 2012
Follow-up meeting	COMPLETE	August 30, 2012
Continue follow-up meetings	ONGOING	

COMPLETE

3.1.4 New Position for Vice President of Reliability Coordination (ORG4)

The WECC Reliability Coordination function now encompasses nearly half of WECC's budget and staff. To bring the necessary focus and direct line of sight for that function, WECC created the new position of Vice President, Reliability Coordination and included it in the WECC Executive Steering Team (WEST). John McGhee was appointed to this position on May 21, 2012.

Milestone	Status	Completion Date
Vice President appointed	COMPLETE	May 21, 2012

COMPLETE

3.1.5 Review of Standards for Areas of Improvement (ORG5)

WECC has observed that, in some cases, NERC standards do not explicitly address the actions identified in several of the recommendations. For example, while some standards say that studies must be performed, they do not identify what conditions or

parameters must be used. Other standards require that entities “coordinate” but do not define what level of coordination is expected for various aspects.

In some cases, WECC believes the level of detail included in standards is appropriate, and, through the O&P activities listed below, is developing guidelines that identify best practices. In other cases, changes may be necessary to address reliability concerns. In those instances WECC will develop Standard Authorization Requests (SAR).

WECC will coordinate SARs and gap issues with NERC and their Reliability Issues Steering Committee (RISC).

The WECC Standards Department and Compliance Department are working together on a thorough review of standards associated with the recommendations. This review will include:

- identification of standards related to the recommendations in the Joint Report;
- identification of areas where standards do not explicitly require the actions in the recommendations of the Joint Report
- analysis of the current and previous monitoring activities as specified in previous Compliance Monitoring and Enforcement Program Implementation Plans; and
- suggestions for future actions.

WECC has posted the [preliminary analysis](#) of NERC standards and will continue to review and work with NERC on follow-up actions.

Milestone	Status	Completion Date
Meeting between Standards and Compliance Departments	COMPLETE	August 21, 2012
Review all standards associated with Recommendations	COMPLETE	September 28, 2012
Preliminary analysis posted and provided to NERC	COMPLETE	September 28, 2012
Review analysis and develop action plans in collaboration with NERC	Not Started	December 31, 2012
Submit any applicable SARs	Not Started	March 31, 2013

3.1.6 Human Resource Development (ORG6)

WECC has discussed the need for qualified resources to meet the continuing demands of operating the BES with utility executives. This includes the critical skill sets of system operators, engineers, and analysts that are in high demand. WECC has had preliminary discussions with some utilities about the possibility of resource sharing or cross training opportunities, as well as the potential to work with educational institutions to develop the necessary skill sets in future employees. The issue of the aging workforce in the utility industry is well known and creates an opportunity for WECC and the industry to work together to broaden the pool of qualified resources.

Milestone	Status	Completion Date
Discussion with executives	In Progress	March 2013
Action Plan	Not Started	December 2013

3.1.7 Provide Education on Path Rating Process (ORG7)

The WECC Path Rating process is described in the [Overview of Policies and Procedures for Project Coordination Review, Project Rating Review and Progress Reports](#). WECC will provide an educational webinar for interested parties, including NERC and FERC, on the Path Rating process and its use in real-time operations.

Milestone	Status	Completion Date
Identify appropriate Subject Matter Experts	In Progress	October 31, 2012
Identify convenient time	In Progress	October 31, 2012
Provide webinar	Not Started	December 31, 2012

3.1.8 Share Next-Day Studies (RC1)

The RC staff performs a daily next-day study of the expected peak load conditions for the following day. The study is started in the morning with the setup of the study case. The study case starts as a snapshot from the WECC RC state estimator from the previous day's peak, which provides a very reasonable initial setup of generation, load, and actual transmission and generation outages. The next-day study inputs include scheduled transmission and generation outages, load forecast, interchange forecast, and expected generation. The study process takes several hours to complete and is typically finished in the late afternoon. The next-day study inputs and study results are now shared on WECCRC.org with all BAs and TOPs that have signed the WECC Synchrophasor and Operating Reliability Data Sharing Agreement (Universal Non-Disclosure Agreement (NDA)). This sharing began July 16, 2012.

WECCRC.org also allows signatories of the Universal NDA to post their own next-day studies and view the studies that have been posted by other BA and TOP signatories.

Milestone	Status	Completion Date
Notice of intent to publish study inputs and results	COMPLETE	June 8, 2012
Study inputs and results published on WECCRC.org	COMPLETE	July 16, 2012
Allow BA and TOP signatories of the Universal NDA to post and view each others' next-day studies	COMPLETE	August 23, 2012

COMPLETE

3.1.9 Signatures of Universal NDA (RC2)

WECC developed the Universal NDA to facilitate the sharing of synchrophasor data and operating reliability data with BAs, TOs, TOPs, and RCs, while protecting the confidentiality of the data. Sharing this type of data will provide more visibility and consistency of data availability to signatories. As of September 20, 2012, 92 percent of potential signatories have executed the Universal NDA.

Milestone	Status	Expected Completion Date
Universal NDA Distributed	COMPLETE	March 6, 2012
Initial signature deadline	COMPLETE	March 31, 2012
Washington state signatory issue resolved	COMPLETE	September 14, 2012
Anticipated signature from all parties	In Progress	December 31, 2012

3.1.10 Sub-100-kV Facility Identification (RC3)

The RC model currently includes facilities operated at voltages greater than 100 kV, as well as some sub-100-kV facilities that may have an impact on the BES.

The RC is seeking to identify facilities with at least one terminal below 100 kV that may have an impact on the BES. The study involves identifying low-voltage systems that may experience significant flow-through following the loss of parallel higher voltage facilities. The study is being conducted in two phases:

Phase I study: performed using the WECC RC's West-wide System Model (WSM).

Phase II study: will be performed using WECC's planning models.

In conjunction with the Phase I effort, the WECC RC will request that the TOPs provide a list of sub-100-kV facilities that the TOPs feel should be monitored due to the risk of flow through the lower-voltage systems during outage conditions. After Phase I is complete, the WECC RC will enable monitoring in the WECC RC Energy Management System (EMS) for facilities operated at less than 100 kV that are already modeled in the WSM. After Phase II is complete, the WECC RC will identify additional facilities that need to be added to the WSM. The WECC RC EMS models will then be updated to include the identified facilities. After each phase, the RC will seek comment from the TOPs on inclusion of the lower-voltage facilities identified as needing to be monitored in the WECC RC EMS.

Milestone	Status	Expected Completion Date
Phase I Analysis	In Progress	October 12, 2012
Phase I Comment period with TOPs	Not Started	November 12, 2012
Update existing facility monitoring in WECC RC EMS	Not Started	November 19, 2012
Phase II Analysis	Not Started	January 31, 2013
Phase II Comment period with TOPs	Not Started	February 28, 2013
Update WECC RC EMS models to include additional lower voltage facilities	Not Started	June 28, 2013

3.1.11 Share Outage Data with TOPs (RC4)

WECC has enabled all signatories of the Universal NDA to have permission to view its Coordinated Outage System. This provides transparency of scheduled outages throughout the Western Interconnection. A page will be added to the WECCRC.ORG site that explains this process and how to sign up for an account to view the information.

Milestone	Status	Expected Completion Date
Permissions established	COMPLETE	August 22, 2012
Page added to WECCRC.ORG	COMPLETE	August 23, 2012

COMPLETE

3.1.12 Share RC State Estimator and Real-Time Contingency Analysis with TOPs (RC5)

The WECC RC performs real-time state estimation and contingency analysis using the WSM, which represents the entire Western Interconnection. The state estimator applies nearly 100,000 measurements to the WSM to accurately estimate the current state of the power system, including all equipment flows, voltages (magnitude and angle), and injection megawatts/Mvars (from units, loads, or shunt devices). Contingency analysis uses the latest state estimator solution to determine if the system is in an N-1 secure state. Over 7,500 contingencies are executed every five minutes to determine the expected state of the power system following each of the contingencies. To improve the visibility of TOPs, the WECC RC is developing a process by which to share information from these tools. This process will be developed in two steps:

1. Provide a method to allow BAs and TOPs access to actual RC real-time state estimator, contingency analysis, and other situational awareness-enhancing real-time tools.
2. Develop a feedback process to identify and correct issues identified through TOP and BA review of results.

Milestone	Status	Expected Completion Date
Access to actual state estimator and RTCA	Not Started	To be determined
Feedback process	Not Started	To be determined

3.1.13 Enhanced System Operating Limit (SOL) Methodology – Phase I (RC6)

The RC made significant revisions to the document, [WECC RC System Operating Limits Methodology for the Operations Horizon](#). This process describes the WECC RC's protocols and expectations related to establishing and communicating SOLs and IROLs. The changes to this process include adding a clear process for identifying the subset of SOLs that qualify as IROLs in real-time, and a clear definition that an SOL includes all operating limits such as the facility thermal limits, voltage limits, stability limits, and Transmission Path limits. System performance expectations were defined to make it

clear that all reliability-based “operating limits,” including facility limits, are SOLs. In doing so, this takes the number of SOLs that the RC System Operator must monitor from a few hundred to several thousand. The SOL Methodology makes it clear that there is an expectation for TOPs to operate within all reliability-based operating limits as they are all SOLs.

Milestone	Status	Completion Date
Enhanced methodology posted	COMPLETE	April 2, 2012
Educational outreach	COMPLETE	April 30, 2012
Methodology implemented	COMPLETE	June 4, 2012

COMPLETE

3.1.14 SOL Methodology – Phase II (RC7)

The RC is now working on further refining the WECC RC SOL Methodology in Phase II. WECC has identified 19 key issues for Phase II and has populated teams to address each issue. The key issues identified are:

1. Distinguishing between the planning horizon and operations horizon
2. Definitions and terms
3. Appropriateness of using planning criteria for establishment of SOLs in the operations horizon
4. Identification of credible multiple-facility contingencies
5. Determining megawatt load-impact level for defining IROLs in WECC
6. Determining IROLs in the operations horizon
7. Outage SOL/IROL determination
8. Awareness and impact of sub-100-kV facilities
9. Need to conduct full contingency analysis
10. Seasonal SOL coordination
11. Acceptable process for updating/coordinating changes to SOLs/IROLs
12. Benchmarking the WECC RC SOL Methodology with other RCs
13. Study margins
14. Subregional differences within WECC
15. Differences between Path Rating and Path SOL
16. Interface, transfer path, and system interactions
17. Impact of path/facilities/interfaces/systems when determining SOLs/IROLs
18. Controlled separation schemes
19. Implementation Plan for Phase II of the SOL Methodology for the Operations Horizon

Milestone	Status	Expected Completion Date
Identify key issues	COMPLETE	August 2012
Resolve key issues	In Progress	December 31, 2012
New methodology posted	In Progress	March 29, 2013
Educational outreach	Not Started	May 31, 2013
Methodology implemented	Not Started	June 30, 2013

3.1.15 RC Task Force Evaluation (RC8)

The WECC Board established the RCTF to evaluate the RC staffing, tools, and training to determine the current effectiveness and to prepare recommendations for changes necessary for the WECC RC to fulfill its mission and responsibilities. The RCTF met on August 15, 2012 to review the current staffing levels and to work on identifying additional staff necessary to fulfill the recommendations from the Joint Report. Work is in progress to determine how best to improve the WECC RC's wide area view with a more in-depth understanding of the BA and TOP tools needed to provide more focused directives and improve the coordination of operational planning.

Milestone	Status	Expected Completion Date
RC Task Force established	COMPLETE	June 19, 2012
Recommendation report	In Progress	December 7, 2012
Begin to implement RCTF recommendations	Not Started	December 31, 2012
Complete RCTF recommendations	Not Started	December 31, 2014

3.1.16 Improve RC Forecasted Interchange (RC9)

The RC is working to improve how study data, in particular unit commitment data and the forecasted interchange, is obtained and used. Having better interchange and unit commitment data will make the studies far more accurate. The RC is working with BAs to both identify the reasons for errors in forecasts and improve the unit commitment data that are currently provided. Some of those BAs have already made incremental improvements to the data and are submitting the improved forecasted interchange data to the RC for use in next-day studies. A task force will be created to identify metrics that define study quality, and to review and address input data issues.

Milestone	Status	Expected Completion Date
Create a task force to monitor and improve RC and TOP study data and study results	In Progress	December 31, 2012
Address unit commitment data issues for units greater than 200 MW	Not Started	June 1, 2013
Address unit commitment data issues for units less than 200 MW	Not Started	September 30, 2013
Validate interchange data following improvement of unit commitment data; address errors identified	Not Started	December 31, 2013

3.1.17 Additional Formats of Next-day Studies (RC10)

The RC is working on providing its next-day studies in PTI format. This format will allow TOPs to review the completed RC next-day study in power flow tools such as Power System Simulator for Engineering (PSS\E) and Positive Sequence Load Flow (PSLF). This will help the RC and TOPs significantly when they review next-day study case issues as it will allow the TOPs to look into studies executed by the RC. The next-day study cases will be posted to the WECCRC.org site for sharing, with signatories of the West-wide System Model License Agreement.

Milestone	Status	Expected Completion Date
Studies shared in PTI format	In Progress	October 19, 2012

3.1.18 Defined Roles and Responsibilities in SOL Exceedances (RC11)

The RC is developing individual Operating Guides for each WECC Transfer Path and identified Transmission Path to further define the roles and responsibilities of RC System Operators when mitigating an SOL exceedance. RC personnel will coordinate with applicable BA/TOPs to develop Operating Guides that include a description of operating characteristics and identify viable mitigating actions under normal and emergency conditions.

Milestone	Status	Expected Completion Date
Develop Operating Guides	In Progress	June 28, 2013

3.1.19 SOL Reporting Tools (RC12)

The RC is developing tools to identify and report the occurrence of actual and expected post-contingency SOL exceedances. The RC will develop a corresponding process to notify responsible entities of these events to facilitate discussion and determine corrective actions.

Milestone	Status	Expected Completion Date
Develop Reporting Tools	In Progress	December 31, 2012
Develop notification process	In Progress	December 31, 2012

3.1.20 Loss of Real-Time Tools Notification (RC13)

One gap identified in the survey was that nearly half of responding TOPs do not have a formal procedure to notify the RC for the loss of real-time tools. As a result, the RC is working on modifying the WECC RC Data Request to include a telephone notification requirement for loss of real-time data, tools, or applications that reduce the RC System Operator's situational awareness of the BES.

Milestone	Status	Expected Completion Date
Modify WECC RC Data Request	In Progress	October 31, 2012

3.1.21 RC Phase Angle Tools (RC14)

The WECC RC is working on identifying excessive phase angles using several types of tools and data. Currently, the real-time state estimator can estimate phase angles exceeding a defined limit for a small set of transmission lines. Similarly, the RTCA identifies post-contingent phase angle pairs that exceed a defined limit for the same set of Southwest transmission lines. The RC will evaluate additional transmission lines for monitoring phase angle pairs.

The WECC RC is also involved in the Western Interconnection Synchrophasor Project (WISP), which will include direct measurement of phase angles through Phasor Measurement Units (PMU). More than 300 PMUs are being installed in key locations across the Western Interconnection.

Milestone	Status	Expected Completion Date
State estimator approximates phase angle differences for some transmission lines	COMPLETE	July 31, 2012
RTCA calculates post-contingent phase angle differences for some transmission lines	COMPLETE	July 31, 2012
Additional transmission lines are included in the state estimator and RTCA phase angle calculations	In Progress	June 30, 2013
WISP completed	In Progress	September 30, 2013

3.1.22 Coachella Valley Transformers Flagged in RTCA (RC15)

On September 8, 2011, the Coachella Valley transformers were modeled in the RC's RTCA; however, they were not flagged or alarmed. Shortly thereafter, the RC flagged and alarmed these transformers in RTCA.

Milestone	Status	Completion Date
Flag Coachella Valley transformers in RTCA	COMPLETE	September 16, 2011

COMPLETE

3.1.23 2013 Headcount (RC16)

A net of 18 new positions are being added in the 2013 WECC Business Plan and Budget, including 10 unbudgeted positions that are expected to be hired in 2012. The additional headcount are associated with adding a lead Reliability Coordinator and an EMS engineer on each shift; and increased RC responsibilities including workload created by modified standards, increased data sharing, and other responsibilities. WECC is committed to hiring well-qualified individuals and providing sufficient training to assure that they fully understand the operation of the Western Interconnection.

Milestone	Status	Expected Completion Date
Budget approved by WECC Board	COMPLETE	June 26, 2012
Budget approved by FERC	In Progress	October 30, 2012
Positions filled	In Progress	December 31, 2013

3.1.24 Revise Internal Operating Procedures (RC17)

The WECC RC has revised its internal operating procedures to include specific instructions for determining viable mitigation plans, and revised the procedures "[Monitoring of Disturbance Control Performance](#)," "[Monitoring of System Frequency and BA Performance](#)," "[WECC Communication Protocol](#)," and "Monitoring of SOL and IROL violations," and created the new procedure "[Emergency Operations Procedure](#)." Each revised procedure requires the RC System Operator to issue directives specific to circumstances and system conditions. Reliability Coordinator Directives should include options previously discussed with the recipient, if possible, and times for completion of the action by the recipient.

Milestone	Status	Expected Completion Date
Revised Procedures besides SOL/IROL	COMPLETE	August 21, 2012
Revised Procedures posted and noticed to membership	COMPLETE	September 11, 2012
Revised Procedure on SOL/IROL	In Progress	October 12, 2012
Operator training on procedures besides SOL/IROL completed	COMPLETE	September 21, 2012
Operator training on procedure on SOL/IROL completed	Not Started	November 15, 2012

3.1.25 Real-time ICCP Data Hub (RC18)

The WECC RC is moving forward with real-time data sharing using the WECC Extra High Voltage (EHV) ICCP data exchange servers. The real-time ICCP data points will be made available in a prioritized fashion with the highest priority points made available first (highest voltages, WECC Path information, etc.). The WECC RC will ensure that the EHV system performance is acceptable prior to making lower-priority ICCP data

points available. The milestones assume that all required TOPs and BAs that are providing the ICCP data have signed the WECC Universal NDA. If they have not signed the NDAs, then the milestones will slip accordingly.

It is important to note that if the EHV system performance is not acceptable at any time, there will need to be a data-sharing project defined with the users of the service. If the need arises, a cost to be shared by the service users for additional servers and possibly an FTE will be identified.

Milestone	Status	Expected Completion Date
Develop process for BAs and TOPs to request read permission of available points	In Progress	November 1, 2012
Make highest priority data points available to signatories of the Universal NDA	In Progress	December 1, 2012
Review EHV system performance and make additional data points available	Not Started	March 1, 2013

3.1.26 Survey of Western Interconnection Practices (O&P1)

Based on a letter from David Nevius, Senior Vice President of NERC, WECC initiated a survey of TOPs, TPs, PCs, RCs, GOs, and GOPs on processes and practices across the Western Interconnection. The survey was distributed on June 10, 2012, with an initial due date of July 2, 2012. WECC published a [summary of results](#) from the survey, including identified reliability gaps and best practices on July 20, 2012. WECC is currently following up with non-responders.

Milestone	Status	Expected Completion Date
Issue Survey	COMPLETE	June 10, 2012
Summarize initial results	COMPLETE	July 20, 2012
Identify and publish best practices and reliability gaps	COMPLETE	July 20, 2012
Follow-up with non-responders	In Progress	September 30, 2012
Executive follow-up for continued non-responders	Scheduled	October 31, 2012

3.1.27 Best Practices for Next-Day Studies (O&P2)

The recommendations of the Joint Report associated with next-day studies included several items for inclusion in the studies. The Operating Practices Subcommittee (OPS) will develop a guideline outlining the recommended best practices for parameters of next-day studies, including:

- Development of best practices for contingency analysis
- Development of a common methodology and format that will include working with the WECC RC to facilitate use of the RC-posted case as well as integrating these practices into their daily process
- Identification of appropriate elements for inclusion, including internal and external facilities as well as sub-100-kV elements

Milestone	Status	Expected Completion Date
Initial meeting of OPS leadership	COMPLETE	August 9, 2012
Meeting of full OPS	COMPLETE	August 21-22, 2012
First draft of guideline	Not Started	November 2012
Approval of guideline by Operating Committee (OC) (special meeting)	Not Started	January 2013

3.1.28 Consistent Mechanism for Seasonal Planning (O&P3)

There were several gaps associated with seasonal planning that were identified through the survey. Most of these gaps dealt with inconsistencies in system conditions (e.g., outages, facilities for inclusion, contingencies considered, shoulder periods) included, as well as inconsistencies in process (participation in subregional study groups). WECC is working to facilitate a consistent mechanism for seasonal planning. In addition, the seasonal study process will be improved to stress the importance of communication and coordination between planners performing the seasonal studies and the operations staff tasked with operating the system.

Milestone	Status	Expected Completion Date
Initial meeting with subregional study groups	COMPLETE	August 8, 2012
Identify and document roles of subregional study groups	In Progress	January 31, 2013
Enhance process to ensure consistency and coordination of all seasonal studies	Not Started	June 28, 2013
Identify an organization with centralized responsibility for oversight	Not Started	December 31, 2013
Develop process for N-1 contingency analysis for complete WECC footprint	Not Started	June 1, 2014

3.1.29 Ensure Coverage of Planning Coordinators (PC) (O&P4)

WECC has identified that gaps exist in coverage of PCs in the Western Interconnection. WECC is investigating possible solutions to address these gaps and will develop a comprehensive report along with recommendations for WECC Board consideration and action.

Milestone	Status	Expected Completion Date
Review PC requirements in standards	In Progress	October 15, 2012
Discuss at the Planning Coordination Committee (PCC)	Scheduled	October 21-22, 2012
Develop comprehensive report on PC gaps and recommendations	Not Started	February 15, 2013
Discuss and make recommendation at Board of Directors	Not Started	March 13-15, 2013
Final implementation plan	Not Started	December 2013

3.1.30 Model Relays and RAS in Base Cases (O&P5)

Relays and Remedial Action Schemes (RAS) are currently not modeled in base cases or in most TOP studies. It was identified in the survey that the most efficient way to facilitate modeling of relays and RAS by TOPs would be to include them in the base cases. This process will include identifying which relays and RAS should be modeled, and is not intended to model *all* relays and RAS.

Membership of the task force working on this issue will have a representative from each of the following:

OC Operating Committee
 PCC Planning Coordination Committee
 TSS Technical Studies Subcommittee
 RASRS Remedial Action Scheme Reliability Subcommittee
 SRWG System Review Work Group
 RWG Relay Work Group
 MVWG Modeling and Validation Work Group
 WECC RC WECC Reliability Coordinator
 NERC Staff
 WECC Staff

The draft Scope of Work including finalization of membership and task force leadership will be finalized by October 5, 2012 with a tentatively scheduled face-to-face kickoff meeting planned in conjunction with the WECC Standing Committee meetings the week of October 8. WECC is actively participating in the NERC System Analysis and Modeling Subcommittee (SAMS) work on modeling and simulating RAS.

Milestone	Status	Expected Completion Date
Task force under RASRS developed to identify which RAS should be modeled	COMPLETE	August 29, 2012
Draft scope developed for RASRS task force	COMPLETE	September 13, 2012
Finalize scope for RASRS task force	In Progress	October 5, 2012
Finalize membership of task force	In Progress	October 12, 2012

Milestone	Status	Expected Completion Date
Develop process for identifying what relay and RAS information is necessary	Not Started	December 31, 2012
Identify confidentiality issues	Not Started	December 31, 2012
Identify modeling capabilities needed for including relays and RAS	Not Started	November 30, 2012
Develop models of relays and RAS	Not Started	July 31, 2014
Get models included in simulation programs	Not Started	December 31, 2014
Revise Data Preparation Manual	Not Started	March 30, 2015
Issue data request	Not Started	March 30, 2015
Incorporate selected relays and RAS into base cases	Not Started	December 31, 2015

3.1.31 RASRS Review Additional Tie-line Schemes and Safety Nets (O&P6)

In support of this effort, the Remedial Action Scheme Reliability Subcommittee (RASRS) chair sent a data request to all Western Interconnection TOPs for them to provide information on any tie-line scheme and/or safety nets. Staff is working with the RASRS chair and representatives from the Bonneville Power Administration (BPA), Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and NERC staff to establish a task force within RASRS that will not only review this additional data but also review the current RAS definitions in the [PRC-012-014 Regional Criterion](#).

This effort will involve a review of the existing RAS definitions, development of a mechanism for awareness of these tie-line schemes (RC, TOPs), and a process for sharing this RAS data with planning staff of TOPs for incorporation into the planning models. As part of the modeling process, any interaction with other protection systems will be assessed as well. The original data request resulting from the implementation of the PRC-012-014 Regional Criterion has been successful in gathering data on existing schemes as well as identifying several new schemes (i.e., Safety Nets and Local Area Protection Schemes) that will be reviewed by RASRS. Currently the RASRS Chair and Staff Liaison are compiling the new RAS data submittals received and will provide these to both the RASRS and RAS Special Task Force for review.

The recent data request provided 25 new RAS from seven WECC members. This brings the total number of RAS to 218 with 64 WAPS, 134 LAPS and 20 safety nets. Review of this data will be done at RASRS meetings scheduled for November 7-9 and November 26-28, 2012.

Milestone	Status	Expected Completion Date
RASRS Chair requesting additional data	COMPLETE	August 8, 2012
RASRS receiving additional data	COMPLETE	September 15, 2012
RASRS reviewing new data	Not Started	November 29, 2012

3.1.32 Interconnection-wide Coordination of TPL Assessments (O&P7)

WECC will develop a recommendation for coordination of Transmission Planning (TPL) assessments. This coordination will include an Interconnection-wide process for identifying and tracking corrective action plans related to system performance issues, as well as an Interconnection-wide assessment of system performance and information sharing. Information will also be shared with the RC for consideration in the operations timeframe.

Milestone	Status	Expected Completion Date
Survey discussed at TSS meeting	COMPLETE	August 31, 2012
Survey distributed	Not Started	December 31, 2012
Recommendations discussed at January TSS meeting	Not Started	January 2013
Recommendation presented to PCC for approval	Not Started	March 2013
Recommendation presented to Board for approval	Not Started	June 2013

3.1.33 Base Case Coordination System (O&P8)

WECC has been developing a [Base Case Coordination System \(BCCS\)](#) to validate data automatically, build power flow base cases, and store dynamic data in a centralized, Web-accessible database. The BCCS will be PSS/E and PSLF compatible. This will

help improve consistency of data, decrease data errors, increase automation, improve data tracking, and provide centralized data storage. Although this project was started prior to September 8, 2011, it will help address some of the planning issues identified in the Joint Report.

Milestone	Status	Expected Completion Date
RFP for BCCS vendor	COMPLETE	2010
Vendor contracted	COMPLETE	December 2011
BCCS development	In Progress	November 30, 2012
WECC member training and implementation	Not Started	July 2013

3.1.34 Relay Operations Guideline (O&P9)

The survey identified inconsistencies in processes to review relays and assess settings. The Relay Work Group (RWG) will develop a guideline to define best practices and establish some consistency for review of settings for relays below 200 kV and assessing timing of relay settings to allow for manual action. The RWG will coordinate activities with the NERC System Protection and Control Subcommittee.

Milestone	Status	Expected Completion Date
Initial meeting of RWG and RASRS chairs	COMPLETE	August 1, 2012
First draft of guideline	In Progress	November 2012
Final approval of guideline at OC (special meeting)	Not started	January 2013

3.1.35 Benchmark TP Models Against September 8 Event Data (O&P10)

Recommendation 10 states that WECC dynamic models should be benchmarked by TPs against actual data from the September 8th event to improve their conformity to actual system performance. Finding 10 emphasizes that UFLS programs and automatic capacitor switching models need to be improved to get the simulation to match the event. WECC staff will provide the power flow and dynamics data used by NERC and FERC in the event investigation to TPs within the areas affected by the outage for the purpose of performing model validation. WECC will follow up with these entities to identify modeling deficiencies and track improvements.

Milestone	Status	Expected Completion Date
WECC request for power flow and dynamics data from NERC and FERC	COMPLETE	July 10, 2012
WECC receives signed NDAs and distributes data to appropriate entities for benchmarking	Not started	October 31, 2012
TPs complete benchmarking and provide results to WECC	Not started	April 2013
Updated UFLS and automatic capacitor switching models provided to WECC for inclusion in base case models	Not started	June 2013

3.1.36 Sharing Real-time Data Among TOPs (O&P11)

In addition to sharing data between the WECC RC and TOPs, there is also a need for TOPs to share data among themselves. To increase situational awareness, the Critical Infrastructure and Information Management Subcommittee (CIIMS) and Data Exchange Work Group (DEWG) will develop a process for sharing real-time data among Registered Entities and increase situational awareness.

The development will include consideration of what data is currently shared, identification of sources of data, available methods of data sharing, and confidentiality issues. The resulting process will include defining participants, types of data, sample rates, and confidentiality processes.

CIIMS/ EMS Work Group (EMSWG) members and WECC staff (including RC staff) met via conference call on August 16, 2012 to discuss options of TOPs sharing data through the WECC RC or through adjacent entities. Cost effectiveness and staffing issues would need to be considered for each option. WECC will follow up with NERC on the NERC Project 2009-02: Real-time Reliability Monitoring and Analysis Capabilities as well as preparing the Real-time Tools Survey Analysis and Recommendations final report for distribution to all. The group believes the most effective effort would be to use the RTTBPTF report documents and Project 2009-02 White Paper as a starting point rather than recreate new WECC Guidelines. In addition, WECC will determine the status of NERC Project 2009-02 and engage Western Interconnection entities in this effort.

Milestone	Status	Expected Completion Date
Initial meeting of CIIMS and DEWG chairs	COMPLETE	August 16, 2012
Develop draft process document (pending status of NERC Project 2009-02)	Not Started	November 30, 2012
OC approval of process (if applicable)	Not Started	January 31, 2013

3.1.37 Distribute NERC RTTBPTF Report (O&P12)

The survey revealed that several TOPs were not aware of the report by the NERC Real-time Tools Best Practices Task Force (RTTBPTF). WECC has distributed the report to all TOPs in the Western Interconnection.

Milestone	Status	Expected Completion Date
Distribute Report	COMPLETE	August 24, 2012

COMPLETE

3.1.38 Develop Real-time Tools Guideline (O&P13)

Although the NERC RTTBPTF developed a comprehensive report on best practices, the report is now four years old and may be out of date. It also may not consider some issues identified in the September 8, 2011 event. Therefore, the EMSWG will develop a guideline on real-time tools, perhaps as an update to the NERC RTTBPTF Report. Staff will follow up with NERC on NERC Project 2009-02: Real-time Reliability Monitoring and Analysis Capabilities and ascertain the status of the March 13, 2008 Real-time Tools Survey Analysis and Recommendations to determine what if any WECC Guidelines will be required.

Milestone	Status	Expected Completion Date
Initial meeting of EMSWG and DEWG chairs	COMPLETE	August 16, 2012
Review NERC RTTBPTF Report	In Progress	September 30, 2012
Develop Guideline	Not Started	November 30, 2012
OC approval of Guideline	Not Started	January 31, 2013

3.1.39 Real-time Tools Training Guideline (O&P14)

In addition to the need for adequate real-time tools, the Joint Report also cited training on those tools as a gap. At the September 6, 2012 conference call, the OTS Chair and Manager of Training, determined that, rather than OTS developing a guideline on Real-time Tools training, they would instead coordinate with CIIMS and the EMSWG in their effort to review the NERC RTTBPTF Report and development of a Real-time Tools Guideline. Following completion of that effort, the OTS Task Force would develop a training module on the applicable elements of the RTTBPTF Report and the Real-time Tools Guideline and present this training as part of the WECC System Operator Training Program.

Milestone	Status	Expected Completion Date
Initial meeting of OTS Chair and WECC Training Manager	COMPLETE	September 6, 2012
Develop draft training module	Not Started	December 16, 2012
OTS review and approval of training module	Not Started	January 16, 2013

3.1.40 Address Discrepancies Between Planning and Operations Models (O&P15)

To address discrepancies between planning and operations models, WECC is focusing on the major WECC models: the WSM and the planning base cases. WECC has developed the West-wide System Model Base Case Reconciliation Task Force (WBRTF) to address this reconciliation. Work continues on correlating bus numbers with node identifiers and other data, including generator representations, between models.

Milestone	Status	Expected Completion Date
WBRTF Established	COMPLETE	June 2012
Develop process for continued reconciliation	In Progress	November 30, 2012
Identify and resolve discrepancies with membership	In Progress	December 31, 2013
Coordinate updates to planning base cases (as necessary) with members	In Progress	December 31, 2013

Milestone	Status	Expected Completion Date
WECC RC update WSM (as necessary)	In Progress	June 30, 2014

3.1.41 Guideline on Sub-100-kV Elements in Models (O&P16)

The Joint Report identified modeling of sub-100-kV elements in multiple time horizons. WECC believes that the modeling should be consistent throughout time horizons to the extent possible and is developing a guideline specifying which sub-100-kV elements should be included.

Milestone	Status	Expected Completion Date
Identify or form a group to address	In Progress	October 21, 2012
Develop Guideline	Not Started	July 31, 2013
Revise Data Preparation Manual	Not Started	October 31, 2013

3.1.42 Comprehensive Review of RAS (O&P17)

On October 1, 2011, Regional Criterion [PRC-012 through 014-WECC-CRT-1: the Remedial Action Scheme Review and Assessment Plan](#) became effective. This criterion requires TOs, GOs, and Distribution Providers to submit data on RAS, and to assess those RAS for operation, coordination, and effectiveness at least once every five years. RASRS then reviews all of the RAS data that has been submitted. As a part of this process, RASRS will review the San Onofre Nuclear Generating Station (SONGS) Separation Scheme and the S-line RAS during the November RASRS meetings. Continuing reviews of these and all other RAS will be an ongoing process. As part of the PRC-012-014 RAS Criterion annual data request that was completed in December 2011, the RAS Database includes 191 Schemes (59 Wide Area Protection Schemes, 13 Safety Nets, and 119 Local Area Protection Schemes).

Milestone	Status	Expected Completion Date
PRC-012 through 014-WECC-CRT-1 effective	COMPLETE	October 1, 2011
First set of RAS data received	COMPLETE	December 31, 2011
Submit SAR to add requirement for additional information to PRC-(012-014)-WECC-CRT-2	COMPLETE	July 19, 2012
Draft revision to PRC-(012-014)-WECC-CRT-2 posted for comment	COMPLETE	September 10, 2012
Revised PRC-(012-014)-WECC-CRT-2 approval	In Progress	March 30, 2013
Review of SONGS Separation Scheme and S-Line RAS	In Progress	November 28, 2012
Continuing comprehensive review of all RAS	ONGOING	ONGOING

3.1.43 Guideline on Post-Contingent Plans (O&P18)

The OPS will develop a guideline outlining best practices for developing and implementing post-contingent plans to mitigate system issues. This guideline will include consideration of the timing necessary for manual action in a post-contingent timeframe.

Milestone	Status	Expected Completion Date
Initial conference call with OPS leadership	COMPLETE	August 9, 2012
Discussion at full OPS meeting	COMPLETE	August 22, 2012
Development of Guideline	Not Started	October 31, 2012
Approval by OC	Not Started	January 31, 2013

3.1.44 White Paper on Generator Acceleration Controls (O&P19)

Evaluation of the sensitivity of acceleration control functions in turbine controls systems to system events is a complex issue. To address this issue, the Control Work Group (CWG) and WECC staff will develop a white paper to identify the issues involved and further the discussion regarding what can be done. Evaluation of system performance during the September 8, 2011 event, as well as during other events, has indicated that

sometimes generators trip due to acceleration or frequency deviations and further exacerbate the effects of the event. The purpose of the white paper will be to investigate, with the generator manufacturers and owners, whether there are any steps that can be taken to identify the conditions under which generators trip and to improve models used for dynamic stability studies so the tripping can be predicted by the models.

Milestone	Status	Expected Completion Date
Conference call with WECC staff and CWG leadership	COMPLETE	August 20, 2012
Develop White Paper draft	Not Started	January 2013
Approval by OC	Not Started	June 2014

3.1.45 Generator Tripping in Base Cases (O&P20)

Dynamic simulations do not currently provide an indication of possible automatic generator tripping. To provide an indication of when generators may trip in event simulations, WECC will add a default generator tripping model to WECC base cases in a monitor-only mode so that future studies by WECC and its members will have an indication of possible generator tripping.

Milestone	Status	Expected Completion Date
Add the default generator protection model to the WECC master dynamics file	In Progress	October 12, 2012

3.1.46 Review of Elements to Add to BES (O&P21)

On June 22, 2012, FERC issued a Notice of Proposed Rulemaking to approve [NERC's revised Definition of Bulk Electric System](#). This definition establishes a bright-line 100-kV threshold along with several bright-line inclusions and exclusions. The revised definition has an associated exceptions process whereby entities can include or exclude additional facilities with sufficient technical justification. It is expected that WECC will have a role in requesting inclusion exceptions through this process. WECC's review and process will be consistent with any Final Rule from FERC on this issue.

Milestone	Status	Expected Completion Date
Review elements identified by the WECC RC for inclusion in models	In Progress	July 2013
Determine additional criteria necessary for inclusion in the BES	Not Started	December 2013
Coordinate criteria with NERC processes	In Progress	December 2013
Begin initial review of elements	Not Started	January 2014
Ongoing analysis of elements	Ongoing	Ongoing

3.1.47 Consider RTDS (O&P22)

A WECC cross-functional team will meet with Southern California Edison to gain a better understanding of their Real-time Digital Simulation (RTDS) tool. WECC will then discuss whether the tool would be feasible for use and provide sufficient benefit to justify the cost on an Interconnection-wide basis.

Milestone	Status	Expected Completion Date
Meet with SCE to learn more about RTDS	Not Started	March 31, 2013
Discuss merits of exploring use of RTDS on an interconnection-wide basis	Not Started	June 30, 2013

3.1.48 Add Standards to Audit Scope (CPL1)

WECC will consider the findings and recommendations from the Joint Report when performing risk assessments and audit scope determination for future audits to supplement the standards and requirements in the Actively Monitored List (AML). The standards considered will be standards that could have some protection against outages of the type experienced on September 8, 2011.

The changes to the audit scope will include consideration of entity size and type of facilities, and may result in different standard sets for these entities.

Audits that were scheduled for the third and fourth quarter 2012 have been expanded to include the standards and requirements listed below. These are in addition to standards already on the NERC Tier 1 AML and WECC Compliance Monitoring and Enforcement Program Implementation Plans.

- FAC-014-2 R4, R5
- MOD-010 R1, R2
- MOD-012 R1, R2
- PRC-015 R1 R3
- TPL-002 R1, R2, R3
- TPL-003 R1, R2

Milestone	Status	Expected Completion Date
Identification of Standards for addition to audit scope as appropriate	COMPLETE	May 29, 2012
Continual review of audit scope	ONGOING	ONGOING

COMPLETE

3.1.49 Add “Areas of Concern” to Audit Reports (CPL2)

While continuing to audit to the explicit language contained in the standards, auditors will add to audit reports any recommendations or suggestions to enhance reliability. The expectation continues that entities will respond to “Areas of Concern” to address compliance issues. Recommendations or suggestions are intended to enhance reliability even if the entity is already in compliance with the standards.

Milestone	Status	Expected Completion Date
Communication of change to audit staff	COMPLETE	July 2012
Memo to auditors memorializing practice	COMPLETE	September 24, 2012

COMPLETE

3.1.50 Meetings Between Compliance and the WECC RC (CPL3)

The RC and Compliance each have unique insight into the processes and practices of entities throughout the Western Interconnection. As reliability concerns arise, the two groups have varying abilities to affect change. By discussing trends and general concerns among the groups from a high-level perspective, both groups can most effectively address issues. Compliance and the RC are developing regular meetings to discuss any identified trends or areas of concern. WECC will establish written guidelines to establish appropriate parameters of communications to ensure that staff maintains the correct level of confidentiality. At all times during these communications, the WECC RC and Compliance Monitoring staff will maintain confidentiality, and each group will

abide by the confidentiality provisions identified in the NERC Rules of Procedure, WECC Bylaws, and other governing documents.

Milestone	Status	Expected Completion Date
Develop scope, periodicity, and ground rules of meetings	In Progress	October 31, 2012
Hold meetings	ONGOING	ONGOING

3.1.51 Coordinate with NERC on Issues (CPL4)

Compliance management and staff will continue to coordinate with NERC to identify and address issues. With respect to WECC Compliance monitoring activities; WECC will review the standards, entities, and functions noted in the Joint Report and will work with NERC to identify needs for enhanced monitoring activities or improvements in monitoring techniques.

Milestone	Status	Expected Completion Date
WECC work with NERC to review issues and identify opportunities for improvement	In Progress	February 28, 2013

3.2 WECC Member and Registered Entity Activities

In addition to the work underway at WECC, the members and Registered Entities have also expressed a commitment to improving reliability and addressing the issues identified in the Joint Report and in Mr. Cauley's letter. Many members and Registered Entities have taken action to review and improve their own systems, practices, and processes.

[Table 2](#) lists the individual WECC member and Registered Entity activities completed, underway, or planned in response to the event on September 8, 2011. This information has been voluntarily shared with WECC and is therefore not comprehensive. While many entities already had processes or practices in place prior to September 8, 2011 that address some of the recommendations, these activities are not listed. In addition, entity involvement in WECC-led activities is not specifically identified. WECC encourages all entities to coordinate with WECC on their efforts.

Activity Legend: APS Arizona Public Service
 BPA..... Bonneville Power Administration
 CAISO..... California Independent System Operator
 IID Imperial Irrigation District
 PGE Portland General Electric
 PNM Public Service Company of New Mexico
 SCE..... Southern California Edison Company
 SDG&E ... San Diego Gas & Electric Company

Table 2: WECC Member and Registered Entity Activities				
	Entity	Activity	Status	Estimated Completion Date
APS1	APS	Enhance and share next-day studies	COMPLETE	June 2012
APS2	APS	Develop procedures for next-day studies and sharing of such information	COMPLETE	August 15, 2012
APS3	APS	Compare next-day study results to real-time data	COMPLETE	June 2012
APS4	APS	Expand next-day studies to include external facilities	In Progress	October, 2012
APS5	APS	Conduct external contingencies in seasonal studies	In Progress	December 2012
APS6	APS	Share seasonal studies with additional TOPs	COMPLETE	June 2012
APS7	APS	Expand seasonal studies	In Progress	December 2012
APS8	APS	Expand near- and long-term planning studies	In Progress	December 2012
APS9	APS	Benchmark WECC dynamic models	In Progress	February 2013
APS10	APS	Improve real-time external visibility	In Progress	June 2013
APS11	APS	Implement state estimator and RTCA	In Progress	June 2013

Table 2: WECC Member and Registered Entity Activities

	Entity	Activity	Status	Estimated Completion Date
APS12	APS	Ensure Adequacy of Post-contingency Mitigation Plans	In Progress	December 2012
APS13	APS	Create procedure to notify the WECC RC/TOPs if RTCA ceases to operate	In development	June 2013
APS14	APS	Identify valid SOLs and IROLs	COMPLETE	June 2012
APS15	APS	Evaluate Generator Acceleration Control Sensitivity	In Progress	December 2012
APS16	APS	Evaluate SOLs related to relay settings	In Progress	March 2013
APS17	APS	Confirm transformer overload protection relay settings	In Progress	December 2012
APS18	APS	Phase angle difference following loss of transmission line	In Progress	December 2013
BPA1	BPA	Assure conservative limits	COMPLETE	August 16, 2012
BPA2	BPA	Perform next-day studies using state estimator cases	In Progress	March 2013
BPA3	BPA	Implement state estimator and RTCA	In Progress	June 2013
BPA4	BPA	Implement 24/7 study engineer support	In Progress	May 31, 2015
BPA5	BPA	Review of Dispatcher Standing Orders for sufficiency and accuracy of RAS	In Progress	December 2013
BPA6	BPA	Expand dispatch alarms for outages that impact SOLs	In Progress	March 2013
BPA7	BPA	Participate in NWPP Outage Coordination Task Force	In Progress	Unknown
CAISO1	CAISO	Expand next-day studies to include external facilities	In Progress	February 2013
CAISO2	CAISO	Expand Seasonal Planning to include external facilities	COMPLETE	June 2012
CAISO3	CAISO	Review need for RAS	In Progress	March 2013
CAISO4	CAISO	Perform Dynamic Data Validation	In Progress	March 2013

Table 2: WECC Member and Registered Entity Activities

	Entity	Activity	Status	Estimated Completion Date
CAISO5	CAISO	Expand visibility in real-time tools	In Progress	February 2013
CAISO6	CAISO	Revise SOL/IROL methodology consistent with WECC RC	COMPLETE	June 2012
CAISO7	CAISO/SCE	Assess SONGS separation scheme	In Progress	March 2013
CAISO8	CAISO	Increase real-time awareness of angular separation	In Progress	December 2012
IID1	IID	Improve next-day studies	In Progress	August 31,2012
IID2	IID	Share next-day studies with adjacent BAs/TOPs and WECC RC	COMPLETE	August 6, 2012
IID3	IID	Expand next-day studies	In Progress	May 31, 2013
IID4	IID	Conduct full contingency analysis in seasonal studies	In Progress	December 31, 2012
IID5	IID	Revise seasonal study process	In Progress	December 31, 2012
IID6	IID	Include protection systems in seasonal planning process	In Progress	December 31, 2012
IID7	IID	Benchmark actual performance against planned performance	In Progress	December 31, 2012
IID8	IID	Include all critical facilities in current-day analysis	In Progress	May 31, 2013
IID9	IID	Review and revise RTCA model, procedures, and training	In Progress	September 15, 2012
IID10	IID	Review and enhance RTCA application	In Progress	May 31, 2013
IID11	IID	Review Emergency Operations Procedures	COMPLETE	July 31, 2012

Table 2: WECC Member and Registered Entity Activities

	Entity	Activity	Status	Estimated Completion Date
IID12	IID	Review and revise relay settings	In Progress	March 31, 2012
IID13	IID	Implement procedure related to monitoring system conditions	In Progress	October 31, 2012
IID14	IID	Review procedures related to mitigating loading violations	COMPLETE	July 31, 2012
IID15	IID	Review SOLs and potential IROLs	In Progress	December 31, 2012
IID16	IID/CAISO/ SDG&E	Revisit S-Line RAS settings	In Progress	November 30, 2012
IID17	IID	Review sensitivity of generator acceleration control	COMPLETE	July 16, 2012
IID18	IID	Review facility ratings	In Progress	December 31, 2012
IID19	IID	Develop procedures and associated training related to closing lines with large phase angle differences	In Progress	June 30, 2013
PGE1	PGE	Implement dedicated transmission operations	In Progress	December 31, 2012
PGE2	PGE	Establish process to coordinate outages with TOPs and BAs	In Progress	January 31, 2012
PGE3	PGE	Implement multiple scenarios in seasonal studies	In Progress	Unknown
PGE4	PGE	Formalize process for sharing relay trip settings	In Progress	Unknown
PGE5	PGE	Implement state estimator and RTCA	In Progress	January 2013
PGE6	PGE	Review post-contingency mitigation plans	In Progress	Unknown
PGE7	PGE	Evaluate sensitivity of generator acceleration control	In Progress	January 2013
PGE8	PGE	Establish process to review impact of RAS	In Progress	Unknown

Table 2: WECC Member and Registered Entity Activities

	Entity	Activity	Status	Estimated Completion Date
PGE9	PGE	Update relay settings	In Progress	August 2013
PNM1	PNM	Post next-day studies on WECCRC.org	COMPLETE	
PNM2	PNM	Implement state estimator and expand capabilities	COMPLETE	June 4, 2012
PNM3	PNM	Review NERC RTTBPTF Report	In Progress	December 2012
PNM4	PNM	Compare real-time model against planning model	COMPLETE	
PNM5	PNM	Review SOLs and potential IROLs	COMPLETE	June 4, 2012
PNM6	PNM	Remove unnecessary relay	In Progress	December 31, 2012
PNM7	PNM	Increase the use of external data		
SCE1	SCE	Review sensitivity of acceleration control functions	COMPLETE	July 2012

3.2.1 APS will Enhance and Share Next-day Studies (APS1)

Prior to September 8, 2011, APS performed general next-day studies through use of the Arizona Security Monitoring Manual (ASMM) studies and seasonal operating studies. Through these studies, APS system operators identified operating adjustments needed following the planned or unplanned outage of a transmission facility without the need to generate a unique day-ahead study for each day. Upon request, APS system engineers would supplement the ASMM next-day studies by creating unique next-day studies to address system conditions where appropriate. Beginning on June 1, 2012, APS also began generating unique day-ahead studies for each day. APS shares the results of these next-day studies by posting to the WECCRC.org website.

Milestone	Status	Expected Completion Date
Create unique next-day studies	COMPLETE	June 2012
Share results of next-day studies	COMPLETE	June 2012

COMPLETE

3.2.2 APS will Develop Procedures for Next-day Studies (APS2)

APS is developing a new procedure for the next-day study process and sharing the results of that process. This activity includes training of applicable staff.

Milestone	Status	Expected Completion Date
Develop procedure for next-day studies	COMPLETE	August 15, 2012

COMPLETE

3.2.3 APS will Compare Next-day Studies to Real-time Data (APS3)

APS now periodically compares the results for the next-day studies to the actual information for that day to ensure accuracy, and compares real-time data to planning models on a limited basis.

Milestone	Status	Expected Completion Date
Compare next-day studies to real-time data	COMPLETE	June 2012

COMPLETE

3.2.4 APS will Expand Next-day Studies to Include External Facilities (APS4)

APS is acquiring data from neighboring TOPs and BAs on generation and transmission outages, and will implement non-disclosure agreements as necessary to facilitate the exchange of next-day operations. APS is also analyzing how to include additional external sub-100-kV facilities that can impact BES reliability.

Milestone	Status	Expected Completion Date
Acquire data for external facilities	In Progress	October 1, 2012
Include sub-100-kV external facilities	In Progress	December 1, 2012

3.2.5 APS will Include External Contingencies in Seasonal Studies (APS5)

APS is conducting an analysis to identify contingencies outside its own system that can impact the reliability of the BES within its system.

Milestone	Status	Expected Completion Date
Include external contingencies in seasonal studies	In Progress	December 1, 2012

3.2.6 APS will Share Seasonal Studies with Additional TOPs (APS6)

Prior to September 8, 2011, the results of APS's Summer and Winter Operating Studies were routinely shared electronically with IID, Western Area Power Administration (WAPA), Salt River Project (SRP), Tucson Electric Power Company (TEPC), and the WECC RC. Since September 8, 2011, APS has expanded the distribution of this information to also include entities such as SCE, PNM, CAISO, SDG&E, Los Angeles Department of Water and Power (LADWP), NV Energy (NVE), and Southwest Transmission Cooperative, Inc. (SWTC). APS will also provide these studies to other TOPs upon request. In addition, the ASMM is shared with the following entities at least annually and as changes to the ASMM are made: IID, SRP, WAPA, the WECC RC, SDG&E, EPE, CAISO, SCE, LADWP, TEPC, and NVE.

Milestone	Status	Expected Completion Date
Share seasonal studies with additional TOPs	COMPLETE	June 2012

COMPLETE

3.2.7 APS will Expand its Seasonal Studies (APS7)

APS is in the process of expanding the study focus of seasonal planning to include external facilities that impact BES reliability. APS will hire additional engineering staff to support additional study work, including expanding the cases on which APS runs individual planning studies to include multiple base cases, generation maintenance outages, and dispatch scenarios during high-load shoulder periods.

Milestone	Status	Expected Completion Date
Expand seasonal studies to include external facilities	In Progress	December 1, 2012
Hire additional staff to support additional study scenarios	In Progress	December 1, 2012

3.2.8 APS will Expand Near- and Long-term Planning Studies (APS8)

APS currently evaluates the impact of all N-1 outages within the APS footprint, including major transmission outages, and the impact of protection systems in post-contingent conditions. The near- and long-term planning covers critical system conditions and considers internal sub-100-kV facilities and some external sub-100-kV facilities. APS is continuing to develop and enhance its study cases that cover critical system conditions over the planning horizon.

Milestone	Status	Expected Completion Date
Expand near- and long-term planning studies	In Progress	December 2012

3.2.9 APS will Benchmark WECC Dynamic Models (APS9)

Based on the APS review, an improvement in the governor model of one of the combustion turbine units at Yuma was recently provided to WECC for implementation in the dynamic data file. Dynamic models for all generating units are based on verified tests and/or system events.

Milestone	Status	Expected Completion Date
Benchmark dynamic models	In Progress	February 1, 2013

3.2.10 APS will Improve Real-time External Visibility (APS10)

APS is working to obtain sufficient data to monitor significant external facilities in real-time, especially those that are known to have a direct impact on the reliability of the system.

Milestone	Status	Expected Completion Date
Improve external real-time visibility	In Progress	June 2013

3.2.11 APS will Implement State Estimator and RTCA (APS11)

APS is developing a state estimator and RTCA tools to provide operators with enhanced situational awareness to assist them in identifying and planning for contingencies.

Milestone	Status	Expected Completion Date
Implement state estimator and RTCA	In Progress	June 2013

3.2.12 APS will Ensure Adequacy of Post-contingency Mitigation Plans (APS12)

APS is reviewing existing operating processes and procedures to ensure that post-contingency mitigation plans reflect the time necessary to take mitigating actions, including control actions, to return the system to a secure N-1 state as soon as possible, but no longer than 30 minutes following a single contingency. As part of that analysis, APS is reviewing the effect of relays that automatically isolate facilities to determine whether they provide operators sufficient time to take mitigating measures.

Milestone	Status	Expected Completion Date
Ensure adequacy of post-contingency mitigation plans	In Progress	December 1, 2012

3.2.13 APS will Develop Procedures to Notify the RC for Loss of RTCA (APS13)

APS will, upon completion of its RTCA, develop and implement procedures to notify the WECC RC and neighboring TOPs and BAs promptly after losing RTCA capabilities. This will include training the operators on the new procedure.

Milestone	Status	Expected Completion Date
Procedure to notify RC for loss of RTCA	In Progress	June 2013

3.2.14 APS Identified Valid SOLs and IROLs (APS14)

APS worked with the WECC RC and other parties to develop a Hoodoo Wash-North Gila Nomogram and flow mitigation procedure, and determined that Hassyampa-North Gila is not an IROL. APS continues to work with the WECC RC and other entities to determine whether other facilities should be recognized as IROLs, as appropriate.

Milestone	Status	Expected Completion Date
Developed Hoodoo Wash-North Gila Nomogram	COMPLETE	June 1, 2012

COMPLETE

3.2.15 APS will Evaluate Generator Acceleration Control Sensitivity (APS15)

None of the units in the APS system, other than the Palo Verde Nuclear Generating Station (PVNGS), use an acceleration control function to trip a unit on the transmission system. APS will further assess the sensitivity of generator acceleration control, which will include the PVNGS.

Milestone	Status	Expected Completion Date
Evaluate sensitivity of generator acceleration control	In Progress	December 1, 2012

3.2.16 APS will Evaluate SOLs Related to Relay Settings (APS16)

APS' facility ratings methodology requires that the rating be equal to the most limiting piece of equipment, including relay settings. APS is currently reevaluating facility ratings, methodologies, and the implementation of the methodologies to ensure compliance and ensure that the settings do not unnecessarily restrict transmission loadability.

Milestone	Status	Expected Completion Date
Evaluate SOLs related to relay settings	In Progress	March 1, 2013

3.2.17 APS will Confirm Transformer Overload Protection Relay Settings (APS17)

APS is currently reviewing relay settings on transmission lines and transformers to ensure appropriate margins are between relay settings and emergency ratings developed by TOPs. This evaluation will include a determination of whether the settings can be raised to provide more time for operators to take manual action to mitigate overloads that are within the short-time thermal capability of the equipment.

Milestone	Status	Expected Completion Date
Confirm relay settings	In Progress	December 1, 2012

3.2.18 APS will Develop Tools to Determine Phase Angle Differences (APS18)

APS installed a Phasor Measurement Unit (PMU) at the North Gila and Hoodoo Wash substations that will enable the operator to determine the phase angle differences when the line is de-energized. APS is developing a project schedule to add additional PMUs to its system on other line segments and is planning to install additional PMUs for all existing 500-kV and 345-kV substations where they are not already in place. APS has updated procedures and provided training for adding PMUs and mitigating phase angle differences.

Milestone	Status	Expected Completion Date
Install PMUs at North Gila and Hoodoo Wash	COMPLETE	July 17, 2012
Add additional PMUs at all 500-kV and 345-kV substations	In Progress	December 1, 2013
Update procedures and provide training for mitigating phase angles	COMPLETE	May 2012

3.2.19 BPA will Assure Conservative Limits for Contingencies (BPA1)

The Bonneville Power Administration (BPA) reviewed all WECC Path Catalog paths under BPA jurisdiction to assure that they have conservative limits for contingencies and are incorporated in Dispatcher Standing Orders.

Milestone	Status	Expected Completion Date
Review limits for contingencies	COMPLETE	August 16, 2012

COMPLETE

3.2.20 BPA will Perform Next-day Studies using State Estimator Cases (BPA2)

BPA had foundational work for study automation underway, and has expanded that work to include performing next-day studies using state estimator cases. BPA is currently defining steps for implementation.

Milestone	Status	Expected Completion Date
Perform next-day studies using state estimator cases	In Progress	March 2013

3.2.21 BPA will Implement a State Estimator and RTCA (BPA3)

BPA is accelerating its project to implement a state estimator and RTCA, including modeling RAS, for system operators. BPA's effort will include coordinating the WECC RC's WSM with BPA's network model.

Milestone	Status	Expected Completion Date
Implement state estimator and RTCA	In Progress	June 2013

3.2.22 BPA will Implement 24/7 Study Engineer Support (BPA4)

BPA is phasing in 24/7 study engineering support to run RTCA and state estimator studies. BPA is in the process of developing tools, duties, responsibilities, and methods.

Milestone	Status	Expected Completion Date
24/7 study engineering support	In Progress	May 31, 2015

3.2.23 BPA will Review Dispatcher Standing Orders for Sufficiency and Accuracy of RAS (BPA5)

BPA is performing a comprehensive review and update as needed to BPA's Dispatcher Standing Orders (DSO) for sufficiency and accuracy of RAS. Roughly 50 DSOs have been identified for review, and roughly 20 percent have been reviewed and updated.

Milestone	Status	Expected Completion Date
Review Dispatcher Standing Orders	In Progress	December 2013

3.2.24 BPA will Expand Dispatch Alarms for Outages that Impact SOLs (BPA6)

BPA is implementing an expansion of dispatch alarms for internal and external outages that impact SOLs by using real-time electrical status.

Milestone	Status	Expected Completion Date
Expand dispatch alarms	In Progress	March 2013

3.2.25 BPA will Participate in the NWPP Outage Coordination Task Force (BPA7)

BPA is participating in the Northwest Power Pool (NWPP) Outage Coordination Task Force with the goal of assessing and improving regional outage coordination effectiveness.

Milestone	Status	Expected Completion Date
Participate in NWPP Outage Coordination Task Force	In Progress	

3.2.26 CAISO will Expand Next-day Studies to Include External Facilities (CAISO1)

CAISO shares next-day studies with the WECC RC. CAISO executed the Universal NDA to allow data sharing with neighboring TOPs. In addition, CAISO is expanding its network model to include external areas.

Milestone	Status	Expected Completion Date
Share next-day studies with WECC RC	COMPLETE	August 2012
Execute Universal NDA	COMPLETE	April 2012
Expand network model to include external area	In Progress	February 2013

3.2.27 CAISO to Expand Seasonal Planning to Include External Facilities (CAISO2)

CAISO performs summer and winter seasonal assessments that assess the entire CAISO-controlled grid, regardless of its voltage level. The seasonal assessments take into account potential differences in generation dispatch and other topologies.

Milestone	Status	Expected Completion Date
Expand seasonal planning to include external facilities	COMPLETE	June 2012

COMPLETE

3.2.28 CAISO to Review Need for RAS (CAISO3)

CAISO is conducting a planning review of all RAS as part of the 2012/2013 annual ten-year transmission planning cycle. This effort will be coordinated with and provide input into the future review of detailed RAS designs to be performed by transmission owners.

Milestone	Status	Expected Completion Date
Review RAS for continued need	In Progress	March 2013

3.2.29 CAISO to Perform Dynamic Data Validation (CAISO4)

CAISO will perform dynamic data validation by benchmarking simulation results against actual events and measured system performance of September 8, 2011. CAISO transmission planning cases are being developed in coordination with participating transmission owners for the 2012/2013 transmission planning cycle. In addition, CAISO is working with the participating transmission owners to coordinate necessary enhancements to dynamic models. CAISO uses dynamic models provided by its participating transmission owners who are registered NERC Transmission Planners for the CAISO system and are primarily responsible for maintaining system models. CAISO is aware of two specific changes at this time to the planning system dynamic models as a result of the September 8 analysis:

- SDG&E updated underfrequency load shedding models to include updated definite-time, underfrequency load shedding relay data for various buses
- SDG&E updated under- and over-frequency generation tripping data

Operation study power flow and dynamic models have been enhanced to include more complete modeling of the Imperial Irrigation District.

Milestone	Status	Expected Completion Date
Validated dynamic data	In Progress	March 2013

3.2.30 CAISO to Expand Visibility in Real-time Tools (CAISO5)

CAISO has taken several steps to expand visibility in real-time tools for operator situational awareness. The IID system data, APS-Yuma data, and Western Area Lower Colorado (WALC) data will be deployed in the full network model. CAISO has also reduced the RTCA cycle from 15 minutes to five minutes. Finally, CAISO updated procedure 5410 to include notification of the WECC RC and neighboring TOPs and BAs promptly after losing RTCA, and is in the process of training operators.

Milestone	Status	Expected Completion Date
IID system in full network model	COMPLETE	August 16, 2012
APS-Yuma in full network model	In Progress	December 19, 2012
WALC in full network model	In Progress	February 28, 2013
Reduced RTCA cycle from 15 minutes to five minutes	COMPLETE	December 2011
Update procedure to notify WECC RC, TOPs, and BAs for loss of RTCA, and train operators	In Progress	December 11, 2012

3.2.31 CAISO to Revise SOL/IROL Methodology Consistent with WECC RC (CAISO6)

CAISO participated in the WECC RC effort to define its revised SOL methodology. CAISO has Procedure 3100 that provides guidelines in SOL and IROL establishment process, consistent with the WECC RC methodology.

Milestone	Status	Expected Completion Date
Establish SOL/IROL methodology consistent with WECC RC	COMPLETE	June 2012

COMPLETE

3.2.32 CAISO and SCE to Assess SONGS Separation Scheme (CAISO7)

CAISO has developed a RAS review study plan that will be executed as part of the 2012/2013 transmission planning cycle. This study plan will provide the functional review results of the higher priority RAS necessary for the TOs, and will help them prioritize their detailed design reviews. As part of the CAISO 2012/2013 study effort, CAISO will assess the need for periodic reviews and anticipates developing a framework for more frequent reviews (at least for different classes of RAS) than the minimum review requirement of once every five years.

CAISO and SCE coordinated with SDG&E and the WECC RC on assessing the need for the San Onofre 220-kV System Separation Scheme with the SONGS units out of service. Based on that assessment, the separation scheme was temporarily deactivated for the duration of the two SONGS unit outages with new system additions and topology changes for the summer of 2012. The installation of SCE's undervoltage load shedding

scheme and SDG&E's Safety Net ensure reliable system operation while the system separation scheme is temporarily disabled.

SCE and CAISO are evaluating new designs for the San Onofre 220-kV System Separation Scheme so it would meet the requirements of a RAS and avoid SONGS units tripping if activated.

Milestone	Status	Expected Completion Date
RAS review study plan executed	In Progress	March 2013
Assess need for more frequent review of RAS	In Progress	March 2013
Review need for SONGS separation scheme with both units out	COMPLETE	June 2012
Review need for SONGS separation scheme with one or two units in service	Not Started	December 31, 2012

3.2.33 CAISO to Increase Real-time Awareness of Angular Separation (CAISO8)

CAISO is enhancing its RTCA tool to detect potential angular separation between two substations.

Milestone	Status	Expected Completion Date
Add angular separation to RTCA	In Progress	December 2012

3.2.34 IID to Improve Next-day Studies (IID1)

IID will take several steps to improve their next-day study analysis, including developing and implementing a Normal Operations Procedure related to next-day studies as well as archiving of base cases used and adding references to specific base cases.

Milestone	Status	Expected Completion Date
Include archiving bases cases and referencing specific base cases to process	COMPLETE	November 1, 2011
Develop Normal Operating Procedure	COMPLETE	May 30, 2012
Implement Normal Operating Procedures	In Progress	September 27, 2012
Provide training on new procedure for all personnel	In Progress	September 27, 2012

3.2.35 IID Share Next-day Studies with Adjacent BAs/TOPs and WECC RC (IID2)

IID has signed the WECC Universal Non-Disclosure Agreement and now has access to WECCRC.org. IID shares its next-day studies with adjacent BAs/TOPs and the WECC RC.

Milestone	Status	Expected Completion Date
Access to WECCRC.org	COMPLETE	August 6, 2012
Share next-day studies	COMPLETE	August 6, 2012

COMPLETE

3.2.36 IID Include Appropriate Facilities in Next-day Studies (IID3)

IID will revise its next-day studies to include external data and facilities, and internal sub-100-kV facilities that have been identified as impacting the BES. IID will use seasonal studies and identification from external entities to determine which external facilities to study. IID has started modeling the data and is in the process of collecting additional data from external entities.

Milestone	Status	Expected Completion Date
Include identified internal 92-kV facilities	COMPLETE	November 3, 2011
Model and create displays for external data	In Progress	September 6, 2012
Implement first 50 external data points	In Progress	January 8, 2013
Implement final 50 external data points	Not Started	March 21, 2013
Analysis of network expansion for external data	Not Started	May 14, 2013
Inclusion of external facilities above 100 kV	In Progress	May 14, 2013
Inclusion of external facilities below 100 kV	In Progress	May 31, 2013

3.2.37 IID will Conduct Full Contingency Analysis in Seasonal Studies (IID4)

IID will conduct full contingency analysis to identify the contingencies external to IID's system that could impact its reliability. This will include developing a consistent contingency list to be used as a benchmark for seasonal and long-term planning, and developing a system operating procedure to share seasonal studies with TOPs that are shown to affect or be affected by the identified contingencies.

Milestone	Status	Expected Completion Date
Conduct full contingency analysis and share seasonal studies	In Progress	December 31, 2012

3.2.38 IID will Revise its Seasonal Study Process (IID5)

IID will confirm that seasonal planning studies include external and internal facilities that could impact the BES, including any sub-100-kV facilities. IID will also revise the existing process to consider expanding the seasonal studies to include multiple scenarios and base cases. IID will also create a system operating procedure to establish communication between the planning and operations processes. The seasonal planning process will also be revised to include overload relay trip settings on transformers and transmission lines that impact the BES, including those set below 150 percent of their normal rating or 115 percent of the highest rating.

Milestone	Status	Expected Completion Date
Include internal and external facilities, including those below 100 kV that can impact the Bulk Electric System	In Progress	December 31, 2012
Expand seasonal studies to include multiple scenarios and base cases	In Progress	December 31, 2012
Create standard operating procedure for communication between planning and operations	In Progress	December 31, 2012
Include relay settings in seasonal studies	In Progress	December 31, 2012

3.2.39 IID will Include Protection Systems in Seasonal Planning Process (IID6)

IID will develop study cases that cover critical system conditions over the planning horizon; consider the benefits and potential adverse effects of all protection systems (including RAS and overload protection schemes); study the interaction of the RAS; and consider the impact on reliability of elements operated at less than 100 kV.

This process includes requesting information from California ISO, CFE, WALC, APS, SDG&E, and SCE.

Milestone	Status	Expected Completion Date
Include protection systems in seasonal planning process	In Progress	December 31, 2012

3.2.40 IID will Benchmark Actual Performance Against Planned Performance (IID7)

IID will develop a procedure to model planned performance and benchmark against actual performance on an ongoing basis, using WECC dynamic models.

Milestone	Status	Expected Completion Date
Develop process for benchmarking	In Progress	December 31, 2012

3.2.41 IID will Include All Critical Facilities in Current-day Analysis (IID8)

IID will identify the internal and external critical facility data to implement in current-day analysis.

Milestone	Status	Expected Completion Date
Implement internal critical facility data	COMPLETE	November 3, 2011
Identify external data to be included in EMS	COMPLETE	April 8, 2012
Implement external critical facility data	In Progress	May 21, 2013
Implement displays for external data in EMS	In Progress	May 31, 2013

3.2.42 IID will Review and Revise RTCA Model, Procedures, and Training (IID9)

IID will review its RTCA application to ensure that it represents critical facilities needed for the reliable operation of the BES. IID will also review and revise its RTCA procedure. Finally, IID will train its system operators on the RTCA tool.

Milestone	Status	Expected Completion Date
Review and revise RTCA application	In Progress	May 31, 2013
Review and revise RTCA procedure	COMPLETE	September 15, 2012
Provide training to System Operators on RTCA application and procedure	In Progress	October 15, 2012

3.2.43 IID will Review and Enhance RTCA Application (IID10)

IID will enhance its RTCA application to include alarm functionality when results indicate violations of equipment ratings. IID also reviewed its RTCA application to determine if the tool is adequate, operational, and runs frequently enough to provide the System Operator with the situational awareness necessary to identify and plan for contingencies. IID determined that the tool is operational and runs frequently enough. Additional alarming functionality was implemented. IID is in the process of obtaining additional data on external facilities.

Milestone	Status	Expected Completion Date
Review for operability and frequency of running	COMPLETE	April 8, 2012
Add alarms	COMPLETE	May 15, 2012
Obtain data on external critical facilities	In Progress	May 31, 2013

3.2.44 IID will Review Emergency Operations Procedures (IID11)

IID reviewed its Emergency Operations Procedures to ensure that plans include provisions for post-contingency mitigation plans that allow enough time for the System Operators to return the system to a secure N-1 state as soon as possible, but no longer than 30 minutes. IID implemented a procedure related to the mitigation of transformer and transmission line overloading on interconnected facilities. IID worked with the WECC RC, CAISO, APS, WALC, SDG&E, SCE, and CFE to jointly develop the procedure "WECC RC Monitoring of the Imperial Valley and San Diego Areas."

Milestone	Status	Expected Completion Date
Review and implement revised Emergency Operations Procedures	COMPLETE	July 31, 2012

COMPLETE

3.2.45 IID will Review and Revise Relay Settings (IID12)

IID will review all relay settings that automatically isolate transformers and transmission lines to ensure that they provide system operators sufficient time to take mitigating measures in existing processes and procedures. This review will also ensure that there are appropriate margins between relay settings and emergency ratings developed by transmission providers.

Initial changes have included installing additional relays with revised settings at the Coachella Valley Substation, Ramon Substation, El Centro Switching Station, and Niland Substation. IID is also installing additional relays with revised settings at Pilot Knob, Midway, Highline, and Avenue 58.

Milestone	Status	Expected Completion Date
Review 230-kV line relay settings	COMPLETE	May 4, 2011
Install additional relays at CV, Ramon, El Centro, Niland	COMPLETE	August 9, 2011
Install additional relays at Pilot Knob, Midway, Highline, Avenue 58	In Progress	March 31, 2013
Review settings on 161-kV transmission lines	In Progress	March 31, 2013

3.2.46 IID will Implement a Procedure Related to Monitoring System Conditions (IID13)

IID will implement a procedure related to monitoring system conditions.

Milestone	Status	Expected Completion Date
Develop and implement procedure	In Progress	October 31, 2012

3.2.47 IID will Review Procedures Related to Mitigating Loading Violations (IID14)

IID will review all procedures related to mitigating loading violations (SOLs and IROLs). IID received the WECC RC procedure, provided a copy of the procedure to the IID system operators, and performed an annual review of the emergency operating plan that identified procedures for mitigating SOL and IROL violations.

Milestone	Status	Expected Completion Date
Receive and distribute WECC RC procedure	COMPLETE	July 31, 2012
Review IID EOP Plan	COMPLETE	April 18, 2012

COMPLETE

3.2.48 IID will Review SOLs and Potential IROLs (IID15)

IID will work with the WECC RC and TOPs to consider whether Path 44 and the Hassyampa – North Gila line should be recognized as IROLs. IID will evaluate and coordinate existing SOLs to ensure that they take into account all transmission and generation facilities and protection systems that impact the reliability of the BES.

Milestone	Status	Expected Completion Date
Evaluate Path 44 and Hassyampa-North Gila	In Progress	December 31, 2012
Evaluate and coordinate SOLs	In Progress	December 31, 2012

3.2.49 IID, SDG&E and CAISO will Revisit S-Line RAS Settings (IID16)

IID will revisit the S-Line RAS protection settings to ensure coordination with other protection systems to prevent adverse impact to the BES, premature operation, or excessive isolation of facilities. IID is currently in the process of reviewing the S-line RAS design with the WECC RC, SDG&E, and CAISO. The generator tripping portion of the scheme has been disabled. IID will provide suggested revised S-Line RAS tripping

values to SDG&E, WECC RC, and CAISO. IID will periodically review, along with the WECC RC and SDG&E, the purpose and impact of the RAS.

Milestone	Status	Expected Completion Date
Generator tripping portion of S-Line RAS has been disabled	COMPLETE	June 17, 2012
Coordinate S-Line tripping values	COMPLETE	August 24, 2012
Review S-Line RAS with RASRS	In Progress	November 28, 2012

3.2.50 IID Reviewed Sensitivity of Generator Acceleration Control (IID17)

IID reviewed the sensitivity of the acceleration control functions in turbine control systems to determine whether transient perturbations or fault conditions in the transmission system result in unit acceleration that would trip the unit without allowing time for protective devices to clear the fault on the transmission line. IID determined that none of their turbines incorporate a turbine trip on acceleration.

Milestone	Status	Expected Completion Date
Review acceleration control functions	COMPLETE	July 16, 2012

COMPLETE

3.2.51 IID will Review Facility Ratings (IID18)

IID will review the facility rating methodologies and implementation to ensure that IID's ratings are equal to the most limiting piece of equipment, including relay settings. IID will define the process associated with establishing relay settings that affect emergency ratings.

Milestone	Status	Expected Completion Date
Review facility rating methodologies	In Progress	December 31, 2012

3.2.52 IID will Develop Procedures and Associated Training Related to Closing Lines with Large Phase Angle Differences (IID19)

The IID EMS SCADA system does not currently have the functionality to determine the phase angle difference following the loss of lines. IID will develop procedures related to closing lines with large phase angle differences, and provide training on these

procedures. IID will also explore options for determining phase angle differences and providing contingency analysis related to angular differences and closing lines.

Milestone	Status	Expected Completion Date
Develop procedures for closing lines with large phase angle differences	In Progress	December 31, 2012
Provide training on new procedures	Not Started	December 31, 2012
Explore options for determining phase angle differences	In Progress	June 30, 2013
Explore options for providing contingency analysis related to phase angle differences	In Progress	December 31, 2012

3.2.53 PGE will Implement Dedicated Transmission Operations (PGE1)

Portland General Electric (PGE) will create a transmission operations group. PGE's Transmission Operations section will run the next-day studies and use the state estimator during normal business hours. The state estimator will continue to operate and be available to dispatchers 24/7. This section will initially be operational with current resources and fully functional with backup support, succession planning, etc., with additional positions in the 2013 budget request.

Milestone	Status	Expected Completion Date
Implement dedicated transmission operations	In Progress	December 2013

3.2.54 PGE will Establish a Process to Coordinate Outages with TOPs and BAs (PGE2)

PGE is evaluating the adequacy of existing procedures. Planned outages are currently coordinated with the WECC RC and surrounding TOPs and BAs through the WECC Coordinated Outage System. Unplanned outages are coordinated using the PGE "SCC Responsibility to the Reliability Coordinator" procedure.

Milestone	Status	Expected Completion Date
Evaluate existing procedures	In Progress	January 2013

3.2.55 PGE will Implement Multiple Scenarios in Seasonal Studies (PGE3)

PGE will expand its seasonal study process to include scenarios for spring and fall shoulder periods, as well as multiple load levels and generation patterns.

Milestone	Status	Expected Completion Date
Implement multiple scenarios	In Progress	Unknown

3.2.56 PGE will Formalize a Process for Sharing Relay Trip Settings (PGE4)

PGE will develop a formalized procedure for sharing relay trip settings with neighboring TOPs and BAs.

Milestone	Status	Expected Completion Date
Implement procedure for sharing relay trip settings	In Progress	Unknown

3.2.57 PGE will Implement a State Estimator and RTCA (PGE5)

PGE will develop a functional state estimator and RTCA system. A consultant was scheduled to be on site the week of September 17 to support this work. Once the RTCA is operational, PGE will revise the procedure "SCC Responsibility to the Reliability Coordinator" to include notification of the RC for loss of RTCA capability.

Milestone	Status	Expected Completion Date
Implement state estimator	In Progress	December 31, 2012
Implement RTCA	In Progress	December 31, 2012
Revise procedure for notification of loss of RTCA	Not Started	January 31, 2013

3.2.58 PGE will Review Post-contingency Mitigation Plans (PGE6)

PGE will review post-contingency mitigation plans to verify that they can be executed within 30 minutes.

Milestone	Status	Expected Completion Date
Review post-contingency mitigation plans	In Progress	Unknown

3.2.59 PGE will Evaluate Sensitivity of Generator Acceleration Control (PGE7)

PGE will evaluate the sensitivity of generator acceleration control functions and modify as necessary.

Milestone	Status	Expected Completion Date
Review sensitivity	In Progress	January 2013

3.2.60 PGE will Establish Process to Review Impact of RAS (PGE8)

PGE is planning to establish a process to periodically review any impact of RAS.

Milestone	Status	Expected Completion Date
Establish review process	In Progress	Unknown

3.2.61 PGE will Update Relay Settings (PGE9)

PGE will review transformer relay settings to ensure adequate margins, and will update any settings that are identified to have insufficient margins.

Milestone	Status	Expected Completion Date
Review and update relay settings	In Progress	August 2013

3.2.62 PNM will Post Next-day Studies on WECCRC.org (PNM1)

PNM signed the WECC Universal NDA and now posts multiple next-day studies and results on WECCRC.org for sharing with other signatories of the Universal NDA. PNM coordinates with neighboring entities to help improve the accuracy of next-day study models.

Milestone	Status	Expected Completion Date
Sign Universal NDA	COMPLETE	March 28, 2012
Post next-day studies on WECCRC.org	COMPLETE	

COMPLETE**3.2.63 PNM will Implement State Estimator and Expand Capabilities (PNM2)**

PNM implemented a state estimator and associated real-time tools. PNM is in regular contact with its neighbors to coordinate exchange of topology data, Inter-control Center Communications Protocol (ICCP) object data for breaker and switch indication, and

facility flow and voltage readings as PNM and its neighbors extend their state estimation capability and contingency data bases.

Milestone	Status	Expected Completion Date
State estimator and RTCA capability released	COMPLETE	May 22, 2012
Training and full implementation of state estimator and RTCA	COMPLETE	June 4, 2012
Coordinate with neighbors to expand capabilities	ONGOING	ONGOING

COMPLETE

3.2.64 PNM will Review the NERC RTTBPTF Report (PNM3)

PNM is reviewing the NERC RTTBPTF report to consider future changes to real-time tools.

Milestone	Status	Expected Completion Date
Review Report	In Progress	December 31, 2012

3.2.65 PNM will Compare Real-time Models Against Planning Models (PNM4)

After deploying the state estimator, PNM began comparing the real-time network model against the planning model for verification. Monthly discussions between the appropriate operations and planning personnel are used to ensure consistency between the models on an ongoing basis.

Milestone	Status	Expected Completion Date
Compare Models	COMPLETE	June 2012
Monthly meetings between planning and operations	ONGOING	ONGOING

COMPLETE

3.2.66 PNM Reviewed SOLs and Potential IROLs (PNM5)

PNM reviewed SOLs per the enhanced WECC RC SOL Methodology, including a review for any potential IROLs.

Milestone	Status	Expected Completion Date
Review SOLs and potential IROLs	COMPLETE	June 4, 2012

COMPLETE**3.2.67 PNM will Remove an Unnecessary Over-current Relay (PNM6)**

PNM has only one transformer with over-current backup that could impact the reliability of the BES. PNM has reviewed the relay and has determined that the over-current backup is not needed as the over-temperature protection will protect the transformer. PNM will remove the unnecessary over-current relay.

Milestone	Status	Expected Completion Date
Remove over current-relay	In Progress	December 31, 2012

3.2.68 PNM will increase the use of external data (PNM7)

PNM is continuing to work with other TOs to acquire ICCP object data for facilities that are beyond the boundaries of the PNM BA to further strengthen next-day and real-time system studies and overall situational awareness.

Milestone	Status	Expected Completion Date
Acquire ICCP object data		

3.2.69 SCE will Review the Sensitivity of the Acceleration Control Functions (SCE1)

SCE reviewed and reported that SONGS does not intend to change the sensitivity of the acceleration control functions of the turbine control systems that are established under the jurisdiction of the Nuclear Regulatory Commission (NRC). The acceleration control function of the SONGS turbine control system, along with mechanical design features, are responsible for keeping the mechanical stresses in the turbine blades and rotor to a level that the probability of low-pressure turbine blade failure, ejection and subsequent damage to the reactor containment building is sufficiently low. Settings for the acceleration control functions were determined and put in place prior to commercial operation of the SONGS units.

The NRC has accepted that these analyses demonstrate the probability of low-pressure turbine blade failure is sufficiently low in conjunction with an operating license condition

that requires periodic testing of the turbine over speed trip system and verification of the turbine steam admission (stop/governor) valve's ability to close upon demand.

Milestone	Status	Expected Completion Date
Review acceleration control functions	COMPLETE	July 2012

COMPLETE

3.3 Recommended NERC Activities

[Table 3](#) lists activities that WECC recommends that NERC consider. Many of the recommendations in the Joint Report address continent-wide issues that are or could be more fully addressed through NERC committees or actions.

In some cases, recommendations from the Joint Report address issues that are related to NERC Standards, but for which there is not an explicit standard requirement. Generally, NERC Standards describe “what” needs to be done, but not “how,” and therefore do not include specific tools or detailed processes. In such cases, WECC strongly encourages Registered Entities to review their systems, practices, and processes not only for compliance with the language of the requirement, but also for the intent of the standards and the best interest of the reliability of the Interconnection. For many of these recommendations, the associated WECC activity includes developing guidelines and best practices to give guidance to the industry on potential ways to address issues.

If NERC and FERC believe that recommendations must be mandatory for all Registered Entities, such issues are best addressed through clarifying and adding detail to NERC continent-wide standards. In such cases, WECC recommends that NERC develop SARs to make the appropriate changes to ensure that these activities apply continent-wide and not just to the Western Interconnection.

Table 3: Recommended NERC Activities	
	Activity
NERC1	Contingency Analysis
NERC2	Sub-100-kV Elements
NERC3	Parameters for Simulations
NERC4	Adequate Real-time Tools
NERC5	Notification of Loss of RTCA
NERC6	Sub-100-kV Relays
NERC7	Determination of Phase Angle Differences

Table 3: Recommended NERC Activities	
	Activity
NERC8	Generator Validation Standard Drafting Team
NERC9	Review TOP-003
NERC10	SAMS review Generator Control Issues
NERC11	Consider De-registration Process
NERC12	Consider Planning Coordinator Registration Gap Issues

3.3.1 Contingency Analysis (NERC1)

WECC recommends that NERC examine whether contingency analysis in real-time, next-day, and seasonal studies should be specifically required by standards. The various timeframes may need different requirements and may need to be addressed separately. If NERC believes that contingency analysis should be mandatory in any or all of the time frames, WECC recommends that NERC submit a SAR or a series of SARs to this effect.

3.3.2 Sub-100-kV Elements (NERC2)

To maintain consistency continent-wide, WECC recommends that NERC identify technically-based criteria for identifying which sub-100-kV elements must be modeled in the real-time, next day, seasonal, and near- and long-term horizons. NERC should also identify technically-based criteria for which sub-100-kV elements should be included in the Bulk Electric System. Such criteria must be consistent with any FERC-approved definition of the Bulk Electric System, and should clarify which facilities may be included through any FERC-approved exception process.

3.3.3 Parameters for Simulations (NERC3)

To maintain consistency continent-wide, WECC recommends that NERC consider developing guidelines or standard requirements identifying what base cases and parameters TOPs should use to conduct simulations. NERC should consider whether to specifically include certain bases cases, generation maintenance outages, and dispatch scenarios during high-load shoulder periods in such guidelines or requirements. WECC is currently developing a consistent mechanism for seasonal planning (O&P3), and would support collaboration and coordination with any such NERC effort.

3.3.4 Adequate Real-time Tools (NERC4)

To maintain consistency continent-wide, WECC recommends that NERC consider revising the Real-time Tools Best Practices Task Force Report to identify what constitutes adequate real-time tools. This revision can also account for changes in tools available since the 2008 release of the original report. WECC is currently developing a guideline for the Western Interconnection (O&P13), and would support collaboration

and coordination with any such NERC effort. This could include continuing work on NERC Project 2009-02: Real-time Reliability Monitoring and Analysis Capabilities.

3.3.5 Notification of Loss of RTCA (NERC5)

WECC recommends that NERC examine whether notification of the RCs and neighboring TOPs and BAs after loss of RTCA and other real-time tools should be mandatory. If NERC believes that it should be, WECC recommends that NERC submit a SAR to this effect.

3.3.6 Sub-100-kV Relays (NERC6)

WECC recommends that NERC review PRC-023-2 to determine whether there needs to be any additional inclusion of sub-200-kV relays. PRC-023-2 was not in effect on September 8, 2011.

3.3.7 Determination of Phase Angle Differences (NERC7)

WECC recommends that NERC examine whether tools to determine phase angle differences following the loss of lines and processes to mitigate reclosing of lines with large phase angle differences should be mandatory for all TOPs. If NERC believes that they should be, WECC recommends that NERC submit a SAR to this effect.

3.3.8 Generator Validation Standard Drafting Team (NERC8)

WECC recommends that NERC complete work of the NERC Generator Validation Standard Drafting Team (GVSDT) to develop PRC-024, which will include voltage and frequency ride-through requirements for new generators and reporting requirements for existing generators that cannot meet the voltage and frequency ride-through requirements. WECC anticipates that the PRC-024 reports can be used to provide guidance in modeling tripping of generators that trip within the voltage and frequency ride-through bands specified by the ride-through requirements.

3.3.9 Review TOP-003-2 (NERC9)

Requirement R1.1 of TOP-003-2 includes “a list of data and information needed by the Transmission Operator to support its Operational Planning Analyses and Real-time Monitoring.” NERC could consider modifying TOP-003 to require that the list of data required in 1.1 include the types of facilities required to be studied in next-day studies. In the current version, type of facility is not specifically called out, so it would have to be a decision by the TOP, or the standard could be modified to be more prescriptive.

3.3.10 SAMS Review Generator Control Issues (NERC10)

WECC understands that the NERC SAMS is currently reviewing generator control issues. WECC believes that it is appropriate for NERC to continue to maintain the lead on this issue and WECC would propose to coordinate with NERC on this activity.

3.3.11 Consider De-registration Process (NERC11)

WECC has identified issues related to the process to de-register or de-certify entities not capable of performing functions for which they are registered, and to transfer their responsibilities to other entities or require joint-registration organizations. First; there is no authority to force another entity to assume responsibility for compliance on behalf of the entity being de-registered or de-certified. Second; the NERC Rules of Procedure do not include provisions for de-registering or de-certifying entities. NERC would need to lead any changes to the Rules of Procedure to address this issue.

WECC raised this issue at the NERC Operating Committee Executive Committee meeting in September and understands that this issue will be discussed at the Reliability Issues Steering Committee (RISC) and the Certification and Registration Work Group (CRWG).

3.3.12 Consider Planning Coordinator Registration Gap Issues (NERC12)

The NERC Functional Model identifies three functions responsible for reliability planning: the Planning Coordinator, the Transmission Planner, and the Resource Planner. There is an implied intent that all of the Transmission Owners and Operators, Generator Owners and Operators, Load-Serving Entities, and Distribution Providers conduct their planning activities in coordination with one or more of these reliability planners. Additionally, the Planning Coordinator is tasked with coordinating with adjacent Planning Coordinators. However, the functional model also states that "while the area under the purview of a Planning Coordinator may include as few as one Transmission Planner and one Resource Planner, the Planning Coordinator's scope of activities may include extended coordination with integrated Planning Coordinator's plans for adjoining areas beyond individual system plans." Many Planning Coordinators have assumed the approach that they are a Planning Coordinator only for the functional registrations that are applicable to their own integrated company. There does not seem to be a method for ensuring that all of the functional registrations that must feed data into the Planning Coordinators are represented by one or more Planning Coordinators. The standards (PRC-023-2 for example) require that the GO/GOP obtain approval of the Planning Coordinator for the selection of certain load responsive relay settings. However there is not a corresponding requirement applicable to the PC to ensure that all GO/GOPs are covered by a PC.

The NERC FAQs on the Functional Model state that the Functional Model is not a Reliability Standard. "The Model defines the functions that must be performed to ensure that the bulk electric systems are planned and operated reliably." There is a question in the FAQs "Does the Planning Coordinator consider the Regional Council's planning standards when assessing the plan?" and is answered by "The Planning Coordinator assesses plans against NERC Reliability Standards." This answer directs the Planning Coordinator back to the Reliability Standards and therefore creates a circular reference.

WECC recommends that NERC review the gaps and references associated with the reliability planning functions and develop corresponding mechanisms to close the gaps.

3.4 Cross Referencing Activities to Recommendations and Systemic Issues

Many of the 27 recommendations from the Joint Report are addressed by a set of many activities listed in this Response Report. [Table 4](#) cross-references the activities from Tables 1–3 to the 27 recommendations from the Joint Report. As an example, Recommendation 1 is addressed by WECC through activities RC1, RC2, and RC10, which provide for the RC to share next-day studies; O&P1 and O&P2, which identify best practices and recommend best practices for TOPs to conduct and share next-day studies; and CPL2, through which the Compliance Department can identify “Areas of Concern” if a TOP could improve its practices, even if it is technically compliant. Additionally, individual entities are addressing the recommendation as seen through activities APS1, APS2, APS3, BPA2, CAISO1, IID1, IID2, IID12, PGE1, and PNM1.

[Table 5](#) cross-references the activities from Table 1–3 to the eight systemic issues identified by Gerry Cauley.

Table 4: WECC Activities Completed or Underway in Response to the Joint Report

	Rec1	Rec2	Rec3	Rec4	Rec5	Rec6	Rec7	Rec8	Rec9	Rec10	Rec11	Rec12	Rec13	Rec14	Rec15	Rec16	Rec17	Rec18	Rec19	Rec20	Rec21	Rec22	Rec23	Rec24	Rec25	Rec26	Rec27	
ORG1																												
ORG2																												
ORG3																												
ORG4														X														
ORG5																												
ORG6														X														
ORG7																												
RC1	X	X																										
RC2	X	X																										
RC3			X														X											
RC4		X									X																	
RC5										X	X																	
RC6																			X									
RC7																			X									
RC8														X														
RC9				X																								
RC10	X	X		X																								
RC11													X															
RC12																			X						X			
RC13															X													
RC14																												X
RC15			X																									
RC16														X														
RC17																												
RC18											X																	
O&P1	X	X	X										X															X
O&P2	X	X	X																									
O&P3					X	X	X																					
O&P4					X	X	X				X																	
O&P5								X	X	X																		
O&P6											X																	
O&P7											X																	
O&P8											X																	
O&P9																										X	X	
O&P10										X																		
O&P11											X																	
O&P12											X																	
O&P13												X																

Table 4: WECC Activities Completed or Underway in Response to the Joint Report

	Rec1	Rec2	Rec3	Rec4	Rec5	Rec6	Rec7	Rec8	Rec9	Rec10	Rec11	Rec12	Rec13	Rec14	Rec15	Rec16	Rec17	Rec18	Rec19	Rec20	Rec21	Rec22	Rec23	Rec24	Rec25	Rec26	Rec27	
O&P14											X																	
O&P15																X												
O&P16																	X											
O&P17																			X	X			X	X				
O&P18													X															
O&P19																						X						
O&P20																						X						
O&P21																	X								X	X		
O&P22											X	X																
CPL1																		X					X					
CPL2	X	X																										
CPL3																												
CPL4																												
APS1	X																											
APS2	X																											
APS3	X																											
APS4		X	X																									
APS5					X																							
APS6					X																							
APS7						X	X	X																				
APS8									X																			
APS9										X																		
APS10											X																	
APS11												X																
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APS14																		X										
APS15																						X						
APS16																							X		X	X	X	
APS17																										X		
APS18																												X
BPA1													X															
BPA2	X																											
BPA3											X	X																
BPA4						X						X																
BPA5													X															
BPA6											X																	
BPA7		X																										

Table 4: WECC Activities Completed or Underway in Response to the Joint Report

	Rec1	Rec2	Rec3	Rec4	Rec5	Rec6	Rec7	Rec8	Rec9	Rec10	Rec11	Rec12	Rec13	Rec14	Rec15	Rec16	Rec17	Rec18	Rec19	Rec20	Rec21	Rec22	Rec23	Rec24	Rec25	Rec26	Rec27
CAISO1	X	X	X																								
CAISO2					X	X	X																				
CAISO3									X																		
CAISO4										X																	
CAISO5										X	X	X			X												
CAISO6																		X									
CAISO7																			X				X	X			
CAISO8																											X
IID1	X																										
IID2	X																										
IID3		X	X																								
IID4					X																						
IID5						X	X	X																			
IID6									X																		
IID7										X																	
IID8											X																
IID9											X	X			X												
IID10												X															
IID11													X														
IID12	X		X																						X	X	
IID13													X														
IID14												X															
IID15																		X									
IID16																			X				X				
IID17		X																									
IID18																									X		
IID19																											X
PGE1	X																										
PGE2		X																									
PGE3							X																				
PGE4								X																			
PGE5										X					X												
PGE6												X															
PGE7																						X					
PGE8																							X				
PGE9																									X		
PNM1	X	X																									
PNM2											X	X															

Table 4: WECC Activities Completed or Underway in Response to the Joint Report

	Rec1	Rec2	Rec3	Rec4	Rec5	Rec6	Rec7	Rec8	Rec9	Rec10	Rec11	Rec12	Rec13	Rec14	Rec15	Rec16	Rec17	Rec18	Rec19	Rec20	Rec21	Rec22	Rec23	Rec24	Rec25	Rec26	Rec27
PNM3												X															
PNM4																X											
PNM5																		X									
PNM6																			X								
PNM7		X									X																
SCE1																					X						
NERC1	X				X																						
NERC2			X			X			X								X							X			
NERC3							X																				
NERC4												X															
NERC5															X												
NERC6																									X		
NERC7																											X
NERC8																						X					
NERC9		X	X																								
NERC10																						X					
NERC11																											
NERC12					X	X	X		X																		

Table 5: Reference of Activities to Eight Systemic Issues	
Systemic Issues	Activities
WECC Reliability Coordinator Tools, Authorities, Capabilities, and Support	RC3 RC8 RC9 RC11 RC12 RC13 RC14 RC15 RC17 ORG4 ORG6 ORG7 O&P22
WECC Organization, Governance, and Conflict of Interest	ORG1
WECC Path Ratings and Interconnection Reliability Operating Limits	RC6 RC7 RC11 RC12
System Protection, Remedial Action Schemes, and Special Protection Systems	O&P5 O&P6 O&P9 O&P17 RC7
Data Sharing, Non-Disclosure, and Data Confidentiality Agreements	ORG3 RC1 RC2 RC4 RC5 RC10 RC18
Roles and Responsibilities of Reliability Coordinator (RC), Balancing Authorities (BA), and Transmission Operators (TOPs)	RC1 RC2 RC4 RC5 RC6 RC8 RC17

Table 5: Reference of Activities to Eight Systemic Issues	
Systemic Issues	Activities
	O&P13 O&P14 ORG3 ORG7
Awareness and Recognition of Impacts of Sub-100-kV Systems on bulk power system reliability	RC3 O&P2 O&P9 O&P13 O&P16 NERC11
ERO/Regional Entity (RE) Processes	ORG1 ORG5 CPL1 CPL2 CPL3 CPL4

4 Conclusion

WECC is committed to reliability and many important activities are underway at WECC, its member companies, and its Registered Entities. The activities described in this Response Report outline important ongoing activities in response to the 27 recommendations in the Joint Report and the eight systemic concerns outlined in Gerry Cauley's letter of July 26, 2012.

WECC will continue its leadership role; working with its members and Registered Entities to further enhance the reliability of the Western Interconnection and monitoring progress toward completion of any existing or new activities. WECC will initiate a program of regular reporting with FERC, NERC, the WECC Board of Directors, and WECC's membership.

WECC commends the commitment of its membership and Registered Entities to improving reliability and addressing the recommendations of the Joint Report.