
 California ISO <small>MEMBER</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

CAISO-RC West Coordination Plan

Table of Contents

Introduction.....	2
1. Responsibilities – Authorization	2
2. Responsibilities – Delegation of Tasks	3
3. Common Tasks for Next-Day and Current-Day Operations	3
4. Next Day Operations	4
5. Current-Day Operations.....	5
6. Emergency Operations	7
7. System Restoration	8
8. Coordination Agreements and Data Sharing.....	9
9. Facility	9
10. Staffing	11
11. APPENDIX A – RC West Governing Documents.....	12
12. APPENDIX B – RC West Agreements with External Entities	12
13. APPENDIX C –RC West Reliability Area Map	13
14. APPENDIX D – RC West Reliability Coordination Procedures.....	15

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

Introduction

The North American Electric Reliability Corporation (NERC) requires every Region, sub-region, or interregional coordinating group to establish a Reliability Coordinator to provide the reliability assessment and emergency operations coordination for the Balancing Authorities and Transmission Operators within the Regions and across the Regional boundaries.


California ISO Reliability Coordinator (RC WEST) serves as the reliability coordinator (RC) for Balancing Authority (BA) customers and the Transmission Operating (TOP) customers in their respective BA Areas. The RC WEST functions associated with the reliability of the Bulk Electric System (BES) include:

- Review and approval of planned facility, transmission line outages and generation outages based upon current and projected system conditions,
- Monitoring facilities within its Reliability Coordination Area and neighboring Reliability Coordination areas to identify any System Operating Limit (SOL) exceedances and to determine any Interconnection Reliability Operating Limit (IROL) exceedances within its Reliability coordination area, and
- Issuing Operating Instructions to ensure reliability of the BES is maintained.

RC WEST procedures and policies are consistent with NERC and WECC Regional Reliability Organization (RRO) Standards.

1. Responsibilities – Authorization

- 1.1. Authority to Act - RC WEST is responsible for the reliable operation of the BES within its Reliability Coordination Area, in accordance with NERC Standards and Regional policies and standards. RC WEST's authority to act is derived from a set of agreements that all RC WEST members have executed (See Appendices A and C).
- 1.2. Decision Making Authority - RC WEST has clear decision-making authority to act and to direct or instruct members within its Reliability Coordination Area to take action to preserve the integrity and reliability of the BES. RC WEST's responsibilities and authorities, as well as its members' responsibilities, are clearly defined in the governing documents.
- 1.3. Wide Area view of its Reliability Coordination Area - RC WEST has a Wide Area view of its Reliability Coordination Area and neighboring areas that have an impact on RC WEST's area. The RC WEST has the operating tools, processes and procedures (including the authority) to prevent or mitigate emergency operating situations in both next-day analysis and during real-time conditions, per the NERC Standards and Regional policies and standards, as well as the governing documents listed in Appendix A of this document.
- 1.4. Independence - RC WEST will act in the best interest of insuring reliability for its Reliability Coordination Area and the Western Interconnection, before that of any other entity. This expectation is clearly identified in the governing documents (see Appendix A).
- 1.5. RC WEST Operating Instruction Compliance - Per the governing documents (see Appendix A), the participating control centers shall carry out required emergency actions as directed or instructed by the RC WEST, including the shedding of firm load if required, unless such actions would violate safety, equipment, regulatory, or statutory requirements.


 California ISO RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

2. Responsibilities – Delegation of Tasks

- 2.1. RC WEST has not delegated any Reliability Coordination tasks.

3. Common Tasks for Next-Day and Current-Day Operations


- 3.1. This section documents how RC WEST conducts current-day and next-day reliability analysis for its Reliability Coordination Area.
- 3.2. Determination of Interconnection Reliability Operating Limits (IROLs) – RC WEST established IROLs in accordance with its SOL methodology
- 3.3. During real-time operations, the RC WEST continuously ensures that the system is resilient and not in danger of cascade failure due to Thermal Cascading (monitored through Real Time Contingency Analysis [RTCA]), Voltage instability (monitored through Voltage Stability Analysis [VSA]) and Dynamic Transient Instability (monitored through Real-Time Dynamic Stability Assessment [RT-DSA]).
- 3.4. RC WEST monitors and acts to prevent the likelihood of a SOL or IROL exceedance in its own area or other areas of the Interconnection, and coordinates with impacted Reliability Coordinators when there is a difference in limits. RC WEST, through the agreements with other Reliability Coordinator neighbors, will coordinate operations to prevent the likelihood of a SOL or IROL in another area. The scope of these agreements includes data exchange and Outage Coordination. (See Appendix B.)
- 3.5. BA and TOP customer control centers in the RC WEST Area must follow Operating Instructions provided by RC WEST. NERC Standards are followed to prevent the likelihood that a disturbance, action, or non-action in its Reliability Coordination Area will result in a SOL or IROL exceedance in its own area or other areas of the Interconnection. When there is a difference in derived limits between RCs, the RC WEST utilizes the most conservative limit until the difference is resolved.
- 3.6. Operate under known and studied conditions and reposition without delay and within no longer than 30 minutes following Contingency events or operational situations that require such action – The RC WEST will perform real-time analysis at least once every 30 minutes. Under normal circumstances, the RC WEST will perform real-time analysis after every 5 minute RTCA and VSA run, and after every 15 Minute RT-DSA run. This provides assurance that entities within its Reliability Coordination Area always operate under known and studied conditions and that they return their systems to a secure operating state following Contingency events, within approved timelines. RC WEST also ensures that entities within its Reliability Coordination Area operate the system to be within all IROLs following Contingencies, within 30 minutes.
- 3.7. On a daily basis, RC WEST conducts Operations Planning Analysis, factoring in planned outages, forecasted loads, generation commitment, and expected net interchange. The analyses include Contingency analysis and voltage stability analysis on key interfaces. These analyses model each operating hour of the day, and include assessment of anticipated (pre-Contingency) and potential (post-Contingency) conditions for next-day operations.

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

- 3.8. Results and mitigation are documented in the Day Ahead Reliability Analysis (DARA) report and made available for review, to RC WEST staff and entities within the RC WEST Reliability Coordinator Area and neighboring Reliability Coordinators. Mitigation plans are formed as needed for potential SOL and IROL exceedance determined in the DARA.
- 3.9. In real-time, RC WEST relies on its telemetry and real-time analysis tools to monitor the real-time system conditions to identify potential IROL and SOL exceedance. RC WEST’s operational philosophy is to monitor and initiate operating plans for all SOL exceedances identified through Real Time Assessment, which include assessment of existing (pre-Contingency) and potential (post-Contingency) operating conditions. RC WEST communicates about IROLs within its RC Area and provides updates as needed via reports, morning conference calls, and in real-time, via voice and messaging.
- 3.10. RC WEST process for issuing Operating Instructions – RC WEST uses a number of communication tools for issuing/receiving of Operating Instructions. The primary communication means is the RC WEST Turret Phone system, which is a dedicated telephone-based system. The RC WEST will also employ a “Grid Messaging System” that sends instructions/message(s) to all control centers simultaneously, and confirms response. RC WEST communicates Operating Instructions in a clear, concise and definitive manner. When appropriate, three-part communication will be required to ensure the communications are correctly received and understood.

4. Next Day Operations

- 4.1. This section documents how RC WEST conducts Operational Planning Analysis for its Reliability Coordination Area.
- 4.2. Reliability Analysis and System Studies – RC WEST conducts Operational Planning Analysis for its Area to assess anticipated (pre-Contingency) and potential (post-Contingency) conditions for next-day operations, and to ensure that the BES can be operated reliably in normal and post-Contingency conditions.
- 4.3. On a daily basis, RC WEST conducts Operational Planning Analysis, utilizing known outages, forecasted loads, generation commitment and dispatch, and expected net interchange, employing the study capability in the RC WEST Network Applications. Base case flows on all monitored facilities are compared against the normal continuous rating. Post-Contingency flows for all monitored facilities are compared against their Emergency rating for all Contingencies. Voltage stability analysis is conducted on key critical interfaces to determine stability limit.
- 4.4. RC WEST coordinates mitigation plans as needed for potential SOL exceedance determined in the Operational Planning Analysis. Mitigation can include additional generation commitment, system reconfiguration, generation re-dispatch, outage postponement or other local flow mitigation procedures.
- 4.5. Information Sharing – BAs and TOPs in the RC WEST Area and neighboring Reliability Coordinator areas provide RC WEST with all information required for system studies, such as critical facility status, load, generation, Contingency Reserve projections and known interchange transactions.
- 4.6. The entities in the RC WEST Area provide expected generation and transmission facility status to the RC WEST outage scheduling application, including forecasted loads, operating


 California ISO <small>MEMBER</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

reserves, and known interchange transactions. RC WEST provides this information through a secure network to applicable members.

- 4.7. Sharing of Study Results - RC WEST makes available the results of its system studies with the entities within its Reliability Coordination Area and/or with other Reliability Coordinators. RC WEST intends to make study results available for the next day by no later than 16:00 Pacific Prevailing time, unless unforeseen circumstances prevent this.
- 4.8. Day Ahead Reliability Analysis Report (DARA) - Made available to RC WEST and neighboring Reliability Coordinators. RC WEST holds daily conference calls as necessary, with participating members and others as part of this process.

5. Current-Day Operations


- 5.1. This section documents how RC WEST conducts Real-Time reliability analysis for its Reliability Coordination Area.
- 5.2. RC WEST uses a suite of real-time network analysis tools to continuously monitor all BES facilities within the RC WEST Area and adjacent areas, including sub-transmission information as needed, to ensure that RC WEST is able to proactively maintain system reliability. RC WEST makes every effort to prevent any expected or potential SOL and IROL exceedance within its Reliability Coordination Area.
- 5.3. RC WEST uses both a state estimator and RTCA as the primary tools to monitor facilities. The state estimator model includes all facilities in the WECC BES, as well as facilities in the RC WEST Area. The model also includes extensive representation of neighboring facilities, in order to provide an effective wide-area view, and is updated as required to maintain accurate modelling.
- 5.4. RTCA is performed on Contingencies using the state estimator model approximately every five minutes. Contingencies include all RC WEST Area equipment and facilities and also any neighboring RC area equipment that is known to impact the RC WEST area.
- 5.5. In order to continuously monitor its voltage stability limited interfaces, RC WEST uses VSA, a real-time calculation tool. VSA takes a state estimator snapshot and calculates a voltage collapse equivalent flow for the interface, based on current real-time telemetry and topology. A VSA Transfer Limit is established as the limit to prevent a potential post-Contingency voltage instability, and RC WEST operates to maintain flows below the limit.
- 5.6. RC WEST uses SCADA alarming to warn of any actual low or high voltages, or facilities loaded beyond their normal or emergency limits.
- 5.7. In addition to the above-mentioned applications, RC WEST uses dynamically updated transmission overview displays to maintain a wide area view. All transmission facilities 220 kV and above are depicted on the overview with flows (MW and MVAR), indication of facilities out of service, high and low voltage warning and alarming. For more detailed monitoring, RC WEST uses bus level one-line diagrams for station level monitoring and information. The one-line diagrams are populated with the real-time telemetered information, as well as the state-estimated solution.
- 5.8. RC WEST notifies neighboring Reliability Coordinators of operational concerns (e.g. declining voltages, excessive reactive flows, or IROL exceedance) that it identifies within the neighboring Reliability Coordination Area, via direct phone calls, conference calls, NERC hotline calls, and/or RCIS messages. RC WEST has joint operating agreements with

 California ISO <small>MEMBER</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

neighboring Reliability Coordinators (listed in Appendix B) to provide emergency assistance during declared emergencies.


- 5.9. RC WEST uses State Estimator, RTCA, SCADA alarming, transmission and summary displays to maintain awareness of the status of all current critical facilities whose failure, degradation or disconnection could result in an SOL or IROL exceedance within its Reliability Coordination Area. These same displays and tools keep RC WEST informed of the status of any facilities that may be required to assist Reliability Coordination Area restoration objectives.
- 5.10. RC WEST is continuously aware of conditions within its Reliability Coordination Area, and includes real-time information in its reliability assessments, via automatic updates to the state estimator, VSA, and transmission displays. RC WEST monitors its Reliability Coordination Area parameters, including the following:
 - 5.10.1. Current status of BES elements (transmission or generation including critical auxiliaries) such as:
 - Automatic Voltage Regulators,
 - Remedial Action Schemes (RAS) and
 - System loading (monitored by state estimator, RTCA, SCADA Alarming and transmission displays).

RC WEST members are required to report to RC WEST any status changes to RAS or when Automatic Voltage Regulators are not in service.
 - 5.10.2. Current pre-Contingency element conditions (voltage, thermal, or stability) – are monitored by state estimator, SCADA Alarming, RTCA transmission and summary displays.
 - 5.10.3. Current post-Contingency element conditions (voltage, thermal, or stability) – are monitored by RTCA, VSA, DSA and transmission displays.
- 5.11. RC WEST monitors the availability and deployment of reactive reserves, by monitoring post-Contingent steady state voltages. Reactive Reserve inquiries are made as needed with applicable parties when reactive reserves in real-time appear inadequate or lower than expected.
- 5.12. Capacity and energy conditions for all RC WEST participants are determined in Day Ahead (DA) and monitored in real-time, in accordance with RC WEST Reliability Processes.
- 5.13. The RC WEST monitors current BA ACEs and System Frequency trends. This information is used to ensure that a participating BA's failure to adhere to NERC BAAL Control Standards is not contributing to reliability-related issues. This includes IROL/SOL exceedances or capacity-related issues. If failure to conform to BAAL standards is contributing to an IROL exceedance, the RC WEST will order the use of all resources, including firm load shedding, to relieve the exceedance.
- 5.14. Planned transmission or generation outages are reported to RC WEST via the Outage Management System (OMS) or other outage reporting applications as agreed to with participants. This outage information, once approved and implemented, automatically or manually updates the Full Network model.
- 5.15. State estimator, RTCA, SCADA Alarming, and transmission displays monitor Contingency Events. Member control centers report Contingency Events on non-monitored facilities, if needed, to RC WEST.

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

- 5.16. RC WEST monitors BES parameters that may have significant impacts upon its Reliability Coordination Area and neighboring Reliability Coordination areas with respect to:
 - 5.16.1. RC WEST monitors all BES facilities within its RC area for current and projected loadings. If reliability impacts are expected or are occurring, the RC WEST may utilize all available resources, up to and including load shedding, to address a potential or actual IROL exceedance. The RC WEST has EMS displays, which allow RC operators to watch and monitor all IROL limits.
 - 5.16.2. RC WEST monitors participating BA's and Reserve Sharing Groups' (RSG) Contingency Reserve Actual (CRA) versus their Contingency Reserve Obligation (CRO) to ensure the necessary amounts of Operating Reserves are available as required to meet NERC BAL and EOP Standards. If needed, the RC WEST will undertake Energy Emergency Alert (EEA) procedures or assist with obtaining additional reserves from neighbors.
 - 5.16.3. RC WEST identifies the cause of potential or actual SOL or IROL exceedance via analysis of state estimator results, RTCA results, VSA results, DSA results, SCADA Alarming of outages, transmission displays of changes, and Interchange Transaction impacts. RC WEST will direct or instruct actions including transmission reconfiguration, generation re-dispatch, or emergency procedures to relieve the potential or actual IROL exceedance without delay, and in no longer than 30 minutes. RC WEST is authorized to direct utilization of all resources, including load shedding, to address a potential or actual IROL exceedance.
- 5.17. RC WEST communicates Geo-Magnetic Disturbance forecast information to participating BAs and TOPs via the RC WEST Messaging tool. RC WEST will assist in development of any required response plan and may move to conservative operating mode to mitigate impacts as needed.
- 5.18. RC WEST initiates NERC Hotline discussions, to assist in the assessment of reliability of the Regions and the overall interconnected system, and coordinates actions in anticipated or actual emergency situations. RC WEST will disseminate this information via the RC WEST Messaging tool or by individual phone calls.
- 5.19. RC WEST coordinates, on an as-needed basis, with other Reliability Coordinators and member BAs and TOPs on the development and implementation of action plans to mitigate potential or actual SOL, IROL, BAAL or DCS/BCE exceedance.
- 5.20. The participating BAs and TOPs within the RC WEST Reliability Area inform RC WEST of all changes in status of RAS, including any degradation or potential failure to operate as expected. RC WEST factors these RAS changes into its reliability analyses and updates its Contingency definitions as appropriate.
- 5.21. RC WEST confirms reliability assessment conclusions by analyzing results of state estimator/RTCA and discussions with participating BAs and TOPs and neighboring Reliability Coordinators. RC WEST identifies options to mitigate potential or actual SOL or IROL exceedance by examining existing operating procedures, system knowledge, and power flow analysis to identify and implement only those actions necessary to act in the best interests of the interconnection.


6. Emergency Operations

 California ISO <small>OPERATION</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

- 6.1. RC WEST applies operating procedures, RC0310 - Mitigating SOL and IROL Exceedances and RC00410 - System Emergencies (See appendix D), to direct or instruct its TOPs to return the transmission system to within SOL or IROL limits as soon as possible, but no longer than within 30 minutes, to prevent a single or credible multiple Contingency from resulting in instability, uncontrolled separation, or Cascading Outages that adversely impact the reliability of the BES. These actions may include: reconfiguration, re-dispatch, load transfer, schedule curtailment, controllable device operation or load shedding. Load shedding will be considered a last resort to mitigate reliability issues that occur in real-time.
- 6.2. RC WEST will use RC0310 - Mitigating SOL and IROL Exceedances and/or RC0410 - System Emergencies (See appendix D) when it determines that IROL exceedances are imminent. RC WEST procedures document the processes that RC WEST follows when directing or instructing BAs and TOPs in the actions to be taken to mitigate the IROL exceedance to return the system to a reliable state. RC WEST coordinates its emergency procedures with other Reliability Coordinators, per Appendix B.
- 6.3. RC WEST directs or instructs BAs and TOPs to take actions in the event the loading of transmission facilities progresses to, or is projected to progress to, a SOL or IROL exceedance. Corrective actions may include: reconfiguration, re-dispatch and/or load shedding to prevent or relieve SOL or IROL exceedance. RC WEST will not rely on, nor wait for, the Qualified Transfer Path Unscheduled Flow (USF) procedure to relieve IROL exceedance. RC WEST will assist with coordination of the USF procedure, if doing so will provide additional relief. RC WEST will adhere to the USF procedure instructions, including curtailing transactions.
- 6.4. RC WEST utilizes RC0410 - System Emergencies (See appendix D) to mitigate an Energy Emergency within its Reliability Coordination Area. RC WEST will provide assistance to other Reliability Coordinators, per its respective joint operating agreement listed in Appendix B.
- 6.5. RC WEST utilizes RC0410 - System Emergencies (See appendix D) when it, or a BA or TOP within its Reliability Coordination Area is experiencing a potential or actual Energy Emergency. RC WEST Emergency Operations document the processes and procedures that RC WEST uses to mitigate the emergency condition, including a request for emergency assistance if required.
- 6.6. RC WEST will coordinate drills and simulations on a regular basis to reinforce competencies required for implementation of Emergency procedures.

7. System Restoration

- 7.1. Knowledge of RC WEST Area TOP Restoration Plans – RC WEST is aware of each TOP's System Restoration Plan and has a written copy of each plan. During system restoration, RC WEST monitors restoration progress and acts to coordinate any needed assistance. RC WEST will coordinate the restoration activities, depending on system conditions.
- 7.2. System Restoration Plan – The RC WEST Restoration protocols are contained in the RC System Restoration Plan. Following a Disturbance in which one or more areas within the RC WEST Area become isolated or blacked out, the RC WEST System Operators will implement the RC WEST Restoration Plan. The scope of the RC WEST's Restoration Plan ends when all of the TOPs in the RC WEST Area are interconnected, each TOP has transferred authority back to its respective BA(s), the RC WEST Area is interconnected to its

 California ISO RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

neighboring RC Areas and normal operations can be resumed. This Restoration Plan is drilled at least annually or more frequently, as needed.


- 7.3. Dissemination of Information - RC WEST serves as the primary contact for disseminating information regarding Restoration to neighboring Reliability Coordinators and members not immediately involved in Restoration.
- 7.4. Restoration - RC WEST approves, communicates and coordinates the re-synchronizing of major system islands or synchronizing points so as not to cause a burden on member or adjacent Reliability Coordination Areas.

8. Coordination Agreements and Data Sharing

- 8.1. Coordination Agreements: See Appendix B
- 8.2. Data Sharing - RC WEST determines the data requirements to support its Reliability Coordination tasks and requests such data from members or adjacent Reliability Coordinators. RC WEST provides for data exchange with participating BAs and TOPs and adjacent Reliability Coordinators via a secure network. RC WEST members provide data to RC WEST via mutually agreeable transfer methods identified in the RC WEST's IRO-010 Data Specification. RC WEST provides data to entities outside RC WEST via direct links and mutually agreeable transfer methods identified in IRO-010 Data Specifications.

9. Facility


- 9.1. Business Continuity-RC WEST performs the Reliability Coordinator function at the California ISO Headquarters in Folsom, CA, along with the CAISO control center in Lincoln, CA. The Folsom and Lincoln control centers have the necessary voice and data communication links to appropriate entities within RC WEST Reliability Area to perform their responsibilities. These facilities are staffed 24x7, and are available to act in addressing a real-time emergency condition.
- 9.2. Adequate Communication Links - RC WEST maintains satellite phones, cellular phones, and redundant, diversely-routed telecommunications circuits. There is also a video link between the Folsom and Lincoln Control Rooms.
- 9.3. Multi-directional Capabilities – RC WEST has multi-directional communications capabilities with its members and neighboring Reliability Coordinators, to meet reliability needs of the Interconnection, for both voice and data exchange.
- 9.4. Real-time Monitoring – RC WEST has detailed capability for real-time monitoring of its Reliability Coordination Area and Reliability Coordinators adjacent to the RC WEST Reliability Coordination Area, to ensure that potential or actual SOL or IROL exceedance is identified. RC WEST monitors BES elements (generators, transmission lines, buses, transformers, breakers, etc.) that could result in SOL or IROL exceedance within its Reliability Coordination Area. RC WEST monitors both real and reactive power system flows, operating reserves, and the status of the Bulk Power System elements that are, or could be, critical to SOLs and IROLs and system restoration requirements within its Reliability Coordination Area.

 California ISO <small>MEMBER</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

9.5. Study and Analysis Tools - RC WEST has adequate analysis tools, including state estimation, pre-and post-Contingency analysis capabilities (thermal, stability, and voltage), and wide-area overview displays. RC WEST has detailed monitoring capability of the RC WEST Reliability Area and sufficient monitoring capability of the surrounding Reliability Areas to ensure potential reliability issues are identified. RC WEST continuously monitors key transmission facilities in its area in conjunction with the Members' monitoring of local facilities and issues.

The systems RC WEST uses include:

- Energy Management System (EMS)/Supervisory Control and Data Acquisition (SCADA) System:
 - EMS provides the RC operator with real-time monitoring and visibility of the status of BES transmission and generation facilities, RASs, non-BES facilities that impact the BES, and other critical real-time parameters for the reliable operation of the BES. The EMS system also provides alarming of critical events that affect the reliability of the BES.
- State Estimator (SE):
 - This is an application that performs numerical analysis of the real-time network model and data to determine the system's current condition. The SE can typically identify bad analog telemetry, estimate non-telemetered flows and voltages and determine real time operating limit exceedances. The SE runs every 5 minutes, and provides a base-case solution used by RTCA and VSA applications.
- Real-time Contingency Analysis (RTCA):
 - This is a primary Real-time Assessment application that runs every 5 minutes and automatically performs analyses of all identified single and credible multiple Contingencies that affect the RC Area. The RC operator uses the results to identify potential post-Contingency thermal or voltage exceedances on the system and to proactively develop mitigation plans to ensure reliability.
- Real-time Voltage-Stability Analysis (VSA):
 - This application runs every 5 minutes and performs voltage-stability analyses of predetermined stability limitations on the system to determine voltage-stability limits and margins for those interfaces.
- Real-time Dynamic Stability Analysis (RT-DSA):
 - This application runs every 15 minutes and performs transient stability analyses of predetermined stability limitations on the system to identify transient-stability limits and margins for those interfaces.
- Plant Information (PI) System:
 - This is a reliability tool used to process and provide visualization of complex real-time power system information in a user-friendly format for the RC operator to process and analyze. The tool provides real-time trending of power system parameters, which enhances situational awareness.
- Dispatcher Load Flow (DLF) and Contingency Analysis (CA) Study Tools:
 - These applications are used by the RC operator to manually run load flow and Contingency analysis studies. The Real-time base case solution from SE can be

 California ISO <small>MEMBER</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

loaded into these applications, to be used as a starting point to run offline analysis of any scenario the operator wants to study.

- 9.5.1. RC WEST maintains control standards for its monitoring and analysis tools, including approvals for planned maintenance. RC WEST has procedures in place to mitigate the effects of analysis tool outages. RC WEST ensures that SOL and IROL monitoring continues, even if the main monitoring system is unavailable. RC WEST has backup facilities that shall be used if the main monitoring system is unavailable.


10. Staffing

- 10.1. Staff Adequately Trained and NERC Reliability Coordinator Certified Personnel – The 24 x 7 RC WEST team consists of:

- Lead Reliability Coordinator,
- Reliability Coordinators, and
- Operations Engineers.

All personnel in these positions possess the NERC Reliability Coordinator certification.

- 10.2. Compliance - RC WEST has continuous access to staff who are directly responsible for complying with NERC and WECC Standards.
- 10.3. Comprehensive Understanding - RC WEST operating personnel have an extensive understanding of the BES system within the RC WEST Area, operating practices, operating procedures, operating guides, restoration priorities, restoration objectives, outage plans, equipment capabilities and operational restrictions.
- 10.4. Priority - RC WEST operating personnel place particular attention on SOLs and IROLs and intertie facility limits. RC WEST ensures that protocols are in place allowing RC WEST operating personnel to have the best available information at all times.
- 10.5. Continuous Training - RC WEST's RCs are continuously trained on an ongoing basis to perform their duties, and CAISO Operational Readiness Group uses the "Vision Learning Station" application and NERC System Operator Certification and Continuing Education Database (SOCCED) to track the status of each Reliability Coordinator's training progress, certification and desk qualifications. RC WESTs are expected to regularly participate and take an active role in regional reliability training.


 California ISO <small>INCORPORATED</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

11. APPENDIX A – California ISO Governing Documents

- 11.1. California ISO Operating Agreement - California ISO Website link: <http://www.caiso.com>
- 11.2. California ISO Transmission Tariff California ISO Website link: California ISO Website link: <http://www.caiso.com>

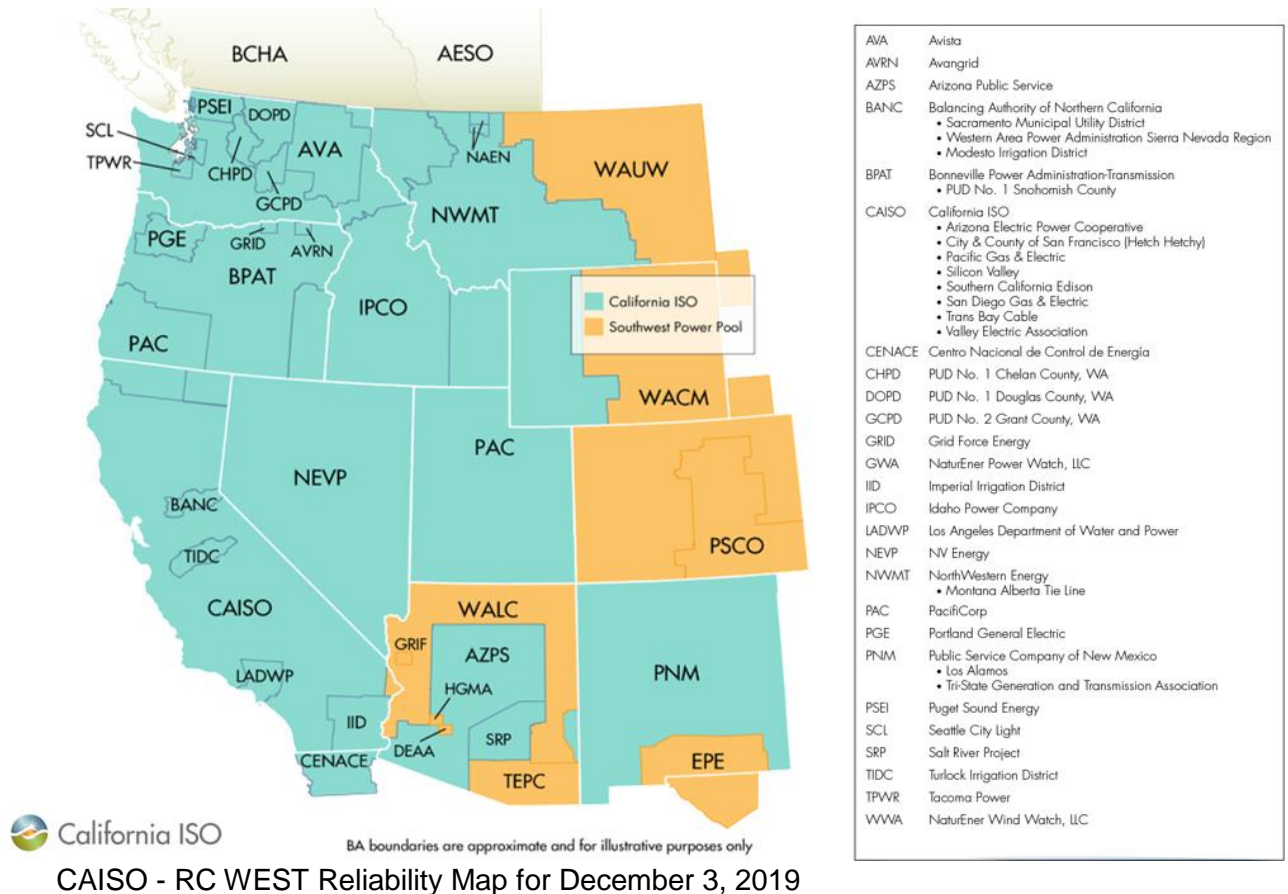
12. APPENDIX B – Agreements with External Entities

- 12.1. British Columbia Hydro Authority (BCHA)
- 12.2. Alberta Electric System Operator (AESO)
- 12.3. Southwest Power Pool (SPP)

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	


13. APPENDIX C – CAISO-RC West Reliability Area Map

13.1 CAISO - RC West




13.2 List of Participating Balancing Authorities and Transmission Operators for November 1st, 2019.

Entity	RC Date	BA	TOP	TOP's BA	NCR ID
Arizona Electric Power Cooperative, Inc. (AEPCCO)	1-Jul		X	CAISO	AEPCCO
Arizona Public Service Company	1-Nov	X	X	APS	AZPS
Avangrid Renewables, LLC	1-Nov	X		AVZN	AVZN
Avista Corporation	1-Nov	X	X	Avista	AVA
Balancing Authority of Northern California (BANC)	1-Jul	X		BANC	BANC
California ISO- BA	1-Jul	X	X	CAISO	CISO
Centro Nacional de Control de Energía (CENACE)	2-Jul	X	X	CFE	CFE

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	


City and County of San Francisco (Hetch Hetchy)	1-Jul			X	CAISO	CCSF
City of Santa Clara dba Silicon Valley Power (SVP)	1-Jul			X	CAISO	SNCL
City of Seattle, City Light Department	1-Nov	X		X	SCL	SCL
City of Tacoma, Department of Public Utilities, Light Division, dba Tacoma Power	1-Nov	X			TPWR	TPWR
Idaho Power Company	1-Nov	X		X	IDPA	IPCO
Imperial Irrigation District (IID)	1-Jul	X		X	IID	IID
Los Angeles Department of Water and Power (LADWP) - City of Los Angeles, Department of Water and Power	1-Jul	X		X	LADWP	LDWP
MATL LLC (Montana Alberta Tie Line LLP)	1-Nov			X	NWMT	MATL
Modesto Irrigation District (MID)	1-Jul			X	BANC	MID
National Nuclear Security Administration – Los Alamos (NNSAL)	1-Nov			X	PNM	MIDT
NaturEner Power Watch, LLC	1-Nov	X		X	GWA	GWA
NaturEner Wind Watch, LLC	1-Nov	X		X	WWA	WWA
Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy	1-Nov	X		X	NVE	NEVP
NorthWestern Corporation d/b/a NorthWestern Energy	1-Nov	X		X	NWMT	NWMT
Pacific Gas and Electric Company (PG&E)	1-Jul			X	CAISO	PCG
PacifiCorp	1-Nov	X		X	PAC	PAC
Portland General Electric Company	1-Nov	X		X	PGE	PGE
Public Service Company of New Mexico (PSNM)	1-Nov	X		X	PNM	PNM
Public Utility District #1 of Chelan County, Washington	1-Nov	X		X	Chelan	CHPD
Public Utility District No. 1 of Douglas County	1-Nov	X		X	Douglas	DOPD
Public Utility District No. 1 of Snohomish County	1-Nov			X	BPA	SNPD
Public Utility District No. 2 of Grant County, Washington	1-Nov	X		X	Grant	GPUD
Puget Sound Energy	1-Nov	X		X	Puget	PSEI
Sacramento Municipal Utility District (SMUD)	1-Jul			X	BANC	SMUD
Salt River Project Agricultural Improvement and Power District (SRP)	1-Nov	X		X	SRP	SRP
San Diego Gas & Electric Company (SDGE)	1-Jul			X	CAISO	SDGE
Southern California Edison Company (SCE)	1-Jul			X	CAISO	SCE
Trans Bay Cable LLC	1-Jul			X	CAISO	TBC
Tri-State Generation and Transmission Association, Inc.	1-Nov			X	PNM	TSGT
Turlock Irrigation District	1-Jul	X		X	TID	TIDC
U.S. Department of Energy acting by and through the Bonneville Power Administration (BPA)	1-Nov	X		X	BPA	BPAT
Valley Electric Association, Inc.	1-Jul			X	CAISO	VEA
Western Area Power Administration - Sierra Nevada Region	1-Jul			X	BANC	WASN

	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

NaturEner USA, LLC	1-Apr	X	X	PPWR	PPWR
Gridforce Energy Management, LLC	1-Nov	X			GRID
Lone Star Transmission, LLC	1-Nov		X	CAISO	LST

14. APPENDIX D – California ISO Reliability Coordination Procedures

Procedure Number	Procedure Title
RC0100	Reliability Coordinator Authority
RC0110	Communications Protocols
RC0120	Guidelines for IRO-010 Data Specification
RC0120A	IRO-010 Data Specification
RC0130	Notification Requirements for Real-Time Events
RC0210	Monitoring Frequency and Balancing Authority Performance
RC0220	Time Error Correction
RC0310	Mitigating SOL and IROL Exceedances
RC0320	Outage Review and Coordination
RC0330	Coordination with Neighboring RCs
RC0410	System Emergencies
RC0420	Event Reporting
RC0430	GMD Operating Plan
RC0460	Reliability Coordinator Area Restoration Plan
RC0460A	Restoration Principles
RC0460B	Whole Partial System Restoration Checklist
RC0460C	Blackout Restoration Using Connection to Energized System Checklist
RC0460D	Blackout Restoration Energizing a De-energized System Checklist
RC0460E	Synchronization Checklist
RC0460F	EOP-005 Plan Review Checklist
RC0470	Loss of Control Center Functionality
RC0510	Quality Assurance of Monitoring and Analysis Tools
RC0520	Loss of Monitoring and Analysis Tools
RC0530	Communications Systems and Testing

 California ISO <small>INCORPORATED</small> RC West	Reliability Coordinator Procedure	Version No. V3 Final	
		Effective Date	11/1/2019
RC West Coordination Plan		Distribution Restriction: None	

RC0540	WIT Administration/ Inadvertent Payback Process
RC0550	RC Procedure Exchange and Distribution Process
RC0560	IROL Dissemination
RC0610	System Operating Limits Methodology For The Operations Horizon
Procedure Number	Procedure Title
RC0620	Operations Planning Analysis (Next Day)
RC0630	Outage Coordination Process
RC0640	Planning Assessment Provision Process (IRO-017 R3, R4)
RC0650	System Behavior Data Provision (MOD-033)
RC0660	Transmission Relay Loadability (PRC-023)
RC0670	Disturbance Monitoring and Reporting Requirements Process (PRC-002)

Version History

Version	Change	Date
Final Draft	Updated with final changes, minor grammar/formatting changes	10/24/2018
Final	Added Area Map, July 1 st Participants and Procedure Table	01/15/2019
Final	Updated to RC West, changed RC Map for 11/2019 area, eliminated Operating Guides	07/10/2019
Final V3	Removed reference to Peak RC, minor grammar corrections	02/03/2020