



Registration Standards Applicability List for Joint Registration Organization (JRO) JRO00010

(Will be called Coordinated Functional Registration (CFR) when the proposed revision to the rules of procedure are passed.)

Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Member Entities

JRO Effective Registration Date

NCR05048 - California Independent System Operator

12/17/2009

NCR05299 - Pacific Gas and Electric Company

12/17/2009



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: BAL-005-0.1b

Requirements:

- R1. All generation, transmission, and load operating within an Interconnection must be included within the metered boundaries of a Balancing Authority Area.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-001-1

Requirements:

- R1. Each Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, and Load-Serving Entity shall have procedures for the recognition of and for making their operating personnel aware of sabotage events on its facilities and multi-site sabotage affecting larger portions of the Interconnection.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

- R2. Each Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, and Load-Serving Entity shall have procedures for the communication of information concerning sabotage events to appropriate parties in the Interconnection.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

- R3. Each Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, and Load-Serving Entity shall provide its operating personnel with sabotage response guidelines, including personnel to contact, for reporting disturbances due to sabotage events.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

- R4. Each Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator, and Load-Serving Entity shall establish communications contacts, as applicable, with local Federal Bureau of Investigation (FBI) or Royal Canadian Mounted Police (RCMP) officials and develop reporting procedures as appropriate to their circumstances.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-002-1

Requirements:

R1. Critical Asset Identification Method — The Responsible Entity shall identify and document a risk-based assessment methodology to use to identify its Critical Assets.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Critical Asset Identification - The Responsible Entity shall develop a list of its identified Critical Assets determined through an annual application of the risk-based assessment methodology required in R1. The Responsible Entity shall review this list at least annually, and update it as necessary.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Critical Cyber Asset Identification - Using the list of Critical Assets developed pursuant to Requirement R2, the Responsible Entity shall develop a list of associated Critical Cyber Assets essential to the operation of the Critical Asset. Examples at control centers and backup control centers include systems and facilities at master and remote sites that provide monitoring and control, automatic generation control, real-time power system modeling, and real-time inter-utility data exchange. The Responsible Entity shall review this list at least annually, and update it as necessary. For the purpose of Standard CIP-002, Critical Cyber Assets are further qualified to be those having at least one of the following characteristics:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Annual Approval - A senior manager or delegate(s) shall approve annually the list of Critical Assets and the list of Critical Cyber Assets. Based on Requirements R1, R2, and R3 the Responsible Entity may determine that it has no Critical Assets or Critical Cyber Assets. The Responsible Entity shall keep a signed and dated record of the senior manager or delegate(s)'s approval of the list of Critical Assets and the list of Critical Cyber Assets (even if such lists are null.)

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-003-1

Requirements:

R1. Cyber Security Policy - The Responsible Entity shall document and implement a cyber security policy that represents management's commitment and ability to secure its Critical Cyber Assets. The Responsible Entity shall, at minimum, ensure the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Leadership - The Responsible Entity shall assign a senior manager with overall responsibility for leading and managing the entity's implementation of, and adherence to, Standards CIP-002 through CIP-009

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Exceptions - Instances where the Responsible Entity cannot conform to its cyber security policy must be documented as exceptions and authorized by the senior manager or delegate(s).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Information Protection - The Responsible Entity shall implement and document a program to identify, classify, and protect information associated with Critical Cyber Assets.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. Access Control — The Responsible Entity shall document and implement a program for managing access to protected Critical Cyber Asset information.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R6. Change Control and Configuration Management — The Responsible Entity shall establish and document a process of change control and configuration management for adding, modifying, replacing, or removing Critical Cyber Asset hardware or software, and implement supporting configuration management activities to identify, control and document all entity or vendor-related changes to hardware and software components of Critical Cyber Assets pursuant to the change control process.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-004-1

Requirements:

R1. Awareness — The Responsible Entity shall establish, maintain, and document a security awareness program to ensure personnel having authorized cyber or authorized unescorted physical access receive on-going reinforcement in sound security practices. The program shall include security awareness reinforcement on at least a quarterly basis using mechanisms such as: Direct communications (e.g., emails, memos, computer based training, etc.); Indirect communications (e.g., posters, intranet, brochures, etc.); Management support and reinforcement (e.g., presentations, meetings, etc.).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Training — The Responsible Entity shall establish, maintain, and document an annual cyber security training program for personnel having authorized cyber or authorized unescorted physical access to Critical Cyber Assets, and review the program annually and update as necessary.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Personnel Risk Assessment — The Responsible Entity shall have a documented personnel risk assessment program, in accordance with federal, state, provincial, and local laws, and subject to existing collective bargaining unit agreements, for personnel having authorized cyber or authorized unescorted physical access. A personnel risk assessment shall be conducted pursuant to that program within thirty days of such personnel being granted such access. Such program shall at a minimum include:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Access — The Responsible Entity shall maintain list(s) of personnel with authorized cyber or authorized unescorted physical access to Critical Cyber Assets, including their specific electronic and physical access rights to Critical Cyber Assets.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-005-1

Requirements:

R1. Electronic Security Perimeter — The Responsible Entity shall ensure that every Critical Cyber Asset resides within an Electronic Security Perimeter. The Responsible Entity shall identify and document the Electronic Security Perimeter(s) and all access points to the perimeter(s).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Electronic Access Controls — The Responsible Entity shall implement and document the organizational processes and technical and procedural mechanisms for control of electronic access at all electronic access points to the Electronic Security Perimeter(s).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Monitoring Electronic Access — The Responsible Entity shall implement and document an electronic or manual process(es) for monitoring and logging access at access points to the Electronic Security Perimeter(s) twenty-four hours a day, seven days a week.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Cyber Vulnerability Assessment — The Responsible Entity shall perform a cyber vulnerability assessment of the electronic access points to the Electronic Security Perimeter(s) at least annually. The vulnerability assessment shall include, at a minimum, the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. Documentation Review and Maintenance — The Responsible Entity shall review, update, and maintain all documentation to support compliance with the requirements of Standard CIP-005.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-006-1

Requirements:

R1. Physical Security Plan — The Responsible Entity shall create and maintain a physical security plan, approved by a senior manager or delegate(s) that shall address, at a minimum, the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Physical Access Controls — The Responsible Entity shall document and implement the operational and procedural controls to manage physical access at all access points to the Physical Security Perimeter(s) twenty-four hours a day, seven days a week. The Responsible Entity shall implement one or more of the following physical access methods:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Monitoring Physical Access — The Responsible Entity shall document and implement the technical and procedural controls for monitoring physical access at all access points to the Physical Security Perimeter(s) twenty-four hours a day, seven days a week. Unauthorized access attempts shall be reviewed immediately and handled in accordance with the procedures specified in Requirement CIP-008. One or more of the following monitoring methods shall be used:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Logging Physical Access — Logging shall record sufficient information to uniquely identify individuals and the time of access twenty-four hours a day, seven days a week. The Responsible Entity shall implement and document the technical and procedural mechanisms for logging physical entry at all access points to the Physical Security Perimeter(s) using one or more of the following logging methods or their equivalent:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. Access Log Retention — The Responsible Entity shall retain physical access logs for at least ninety calendar days. Logs related to reportable incidents shall be kept in accordance with the requirements of Standard CIP-008.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R6. Maintenance and Testing — The Responsible Entity shall implement a maintenance and testing program to ensure that all physical security systems under Requirements R2, R3, and R4 function properly. The program must include, at a minimum, the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-007-1

Requirements:

R1. Test Procedures — The Responsible Entity shall ensure that new Cyber Assets and significant changes to existing Cyber Assets within the Electronic Security Perimeter do not adversely affect existing cyber security controls. For purposes of Standard CIP-007, a significant change shall, at a minimum, include implementation of security patches, cumulative service packs, vendor releases, and version upgrades of operating systems, applications, database platforms, or other third-party software or firmware.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Ports and Services — The Responsible Entity shall establish and document a process to ensure that only those ports and services required for normal and emergency operations are enabled.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Security Patch Management — The Responsible Entity, either separately or as a component of the documented configuration management process specified in CIP-003 Requirement R6, shall establish and document a security patch management program for tracking, evaluating, testing, and installing applicable cyber security software patches for all Cyber Assets within the Electronic Security Perimeter(s).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Malicious Software Prevention — The Responsible Entity shall use anti-virus software and other malicious software (“malware”) prevention tools, where technically feasible, to detect, prevent, deter, and mitigate the introduction, exposure, and propagation of malware on all Cyber Assets within the Electronic Security Perimeter(s).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. Account Management — The Responsible Entity shall establish, implement, and document technical and procedural controls that enforce access authentication of, and accountability for, all user activity, and that minimize the risk of unauthorized system access.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R6. Security Status Monitoring — The Responsible Entity shall ensure that all Cyber Assets within the Electronic Security Perimeter, as technically feasible, implement automated tools or organizational process controls to monitor system events that are related to cyber security.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-007-1

Requirements:

R7. Disposal or Redeployment — The Responsible Entity shall establish formal methods, processes, and procedures for disposal or redeployment of Cyber Assets within the Electronic Security Perimeter(s) as identified and documented in Standard CIP-005.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R8. Cyber Vulnerability Assessment — The Responsible Entity shall perform a cyber vulnerability assessment of all Cyber Assets within the Electronic Security Perimeter at least annually. The vulnerability assessment shall include, at a minimum, the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R9. Documentation Review and Maintenance — The Responsible Entity shall review and update the documentation specified in Standard CIP-007 at least annually. Changes resulting from modifications to the systems or controls shall be documented within ninety calendar days of the change.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-008-1

Requirements:

R1. Cyber Security Incident Response Plan — The Responsible Entity shall develop and maintain a Cyber Security Incident response plan. The Cyber Security Incident Response plan shall address, at a minimum, the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Cyber Security Incident Documentation — The Responsible Entity shall keep relevant documentation related to Cyber Security Incidents reportable per Requirement R1.1 for three calendar years.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: CIP-009-1

Requirements:

R1. Recovery Plans — The Responsible Entity shall create and annually review recovery plan(s) for Critical Cyber Assets. The recovery plan(s) shall address at a minimum the following:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Exercises — The recovery plan(s) shall be exercised at least annually. An exercise of the recovery plan(s) can range from a paper drill, to a full operational exercise, to recovery from an actual incident.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Change Control — Recovery plan(s) shall be updated to reflect any changes or lessons learned as a result of an exercise or the recovery from an actual incident. Updates shall be communicated to personnel responsible for the activation and implementation of the recovery plan(s) within ninety calendar days of the change.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Backup and Restore — The recovery plan(s) shall include processes and procedures for the backup and storage of information required to successfully restore Critical Cyber Assets. For example, backups may include spare electronic components or equipment, written documentation of configuration settings, tape backup, etc.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. Testing Backup Media — Information essential to recovery that is stored on backup media shall be tested at least annually to ensure that the information is available. Testing can be completed off site.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: COM-001-1.1

Requirements:

R1. Each Reliability Coordinator, Transmission Operator and Balancing Authority shall provide adequate and reliable telecommunications facilities for the exchange of Interconnection and operating information:

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall manage, alarm, test and/or actively monitor vital telecommunications facilities. Special attention shall be given to emergency telecommunications facilities and equipment not used for routine communications.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Reliability Coordinator, Transmission Operator and Balancing Authority shall provide a means to coordinate telecommunications among their respective areas. This coordination shall include the ability to investigate and recommend solutions to telecommunications problems within the area and with other areas.

Responsible Members:

NCR05048 California Independent System Operator

R4. Unless agreed to otherwise, each Reliability Coordinator, Transmission Operator, and Balancing Authority shall use English as the language for all communications between and among operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System. Transmission Operators and Balancing Authorities may use an alternate language for internal operations.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have written operating instructions and procedures to enable continued operation of the system during the loss of telecommunications facilities.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: COM-002-2

Requirements:

R1. Each Transmission Operator, Balancing Authority, and Generator Operator shall have communications (voice and data links) with appropriate Reliability Coordinators, Balancing Authorities, and Transmission Operators. Such communications shall be staffed and available for addressing a real-time emergency condition.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall issue directives in a clear, concise, and definitive manner; shall ensure the recipient of the directive repeats the information back correctly; and shall acknowledge the response as correct or repeat the original statement to resolve any misunderstandings.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-001-0

Requirements:

R2. The Transmission Operator shall have an emergency load reduction plan for all identified IROLs. The plan shall include the details on how the Transmission Operator will implement load reduction in sufficient amount and time to mitigate the IROL violation before system separation or collapse would occur. The load reduction plan must be capable of being implemented within 30 minutes.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Transmission Operator and Balancing Authority shall:

Responsible Members:

NCR05048 California Independent System Operator

R4. Each Transmission Operator and Balancing Authority shall have emergency plans that will enable it to mitigate operating emergencies. At a minimum, Transmission Operator and Balancing Authority emergency plans shall include:

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Transmission Operator and Balancing Authority shall include the applicable elements in Attachment 1-EOP-001-0 when developing an emergency plan.

Responsible Members:

NCR05048 California Independent System Operator

R6. The Transmission Operator and Balancing Authority shall annually review and update each emergency plan. The Transmission Operator and Balancing Authority shall provide a copy of its updated emergency plans to its Reliability Coordinator and to neighboring Transmission Operators and Balancing Authorities.

Responsible Members:

NCR05048 California Independent System Operator

R7. The Transmission Operator and Balancing Authority shall coordinate its emergency plans with other Transmission Operators and Balancing Authorities as appropriate. This coordination includes the following steps, as applicable:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-003-1

Requirements:

R1. After taking all other remedial steps, a Transmission Operator or Balancing Authority operating with insufficient generation or transmission capacity shall shed customer load rather than risk an uncontrolled failure of components or cascading outages of the Interconnection.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator and Balancing Authority shall establish plans for automatic load shedding for underfrequency or undervoltage conditions.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. Each Transmission Operator and Balancing Authority shall coordinate load shedding plans among other interconnected Transmission Operators and Balancing Authorities.

Responsible Members:

NCR05048 California Independent System Operator

R4. A Transmission Operator or Balancing Authority shall consider one or more of these factors in designing an automatic load shedding scheme: frequency, rate of frequency decay, voltage level, rate of voltage decay, or power flow levels.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. A Transmission Operator or Balancing Authority shall implement load shedding in steps established to minimize the risk of further uncontrolled separation, loss of generation, or system shutdown.

Responsible Members:

NCR05048 California Independent System Operator

R6. After a Transmission Operator or Balancing Authority Area separates from the Interconnection, if there is insufficient generating capacity to restore system frequency following automatic underfrequency load shedding, the Transmission Operator or Balancing Authority shall shed additional load.

Responsible Members:

NCR05048 California Independent System Operator

R7. The Transmission Operator and Balancing Authority shall coordinate automatic load shedding throughout their areas with underfrequency isolation of generating units, tripping of shunt capacitors, and other automatic actions that will occur under abnormal frequency, voltage, or power flow conditions.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-003-1

Requirements:

- R8. Each Transmission Operator or Balancing Authority shall have plans for operator-controlled manual load shedding to respond to real-time emergencies. The Transmission Operator or Balancing Authority shall be capable of implementing the load shedding in a timeframe adequate for responding to the emergency.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-004-1

Requirements:

R2. A Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator or Load-Serving Entity shall promptly analyze Bulk Electric System disturbances on its system or facilities.

Responsible Members:

NCR05048 California Independent System Operator

R3. A Reliability Coordinator, Balancing Authority, Transmission Operator, Generator Operator or Load-Serving Entity experiencing a reportable incident shall provide a preliminary written report to its Regional Reliability Organization and NERC.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-005-1

Requirements:

R1. Each Transmission Operator shall have a restoration plan to reestablish its electric system in a stable and orderly manner in the event of a partial or total shutdown of its system, including necessary operating instructions and procedures to cover emergency conditions, and the loss of vital telecommunications channels. Each Transmission Operator shall include the applicable elements listed in Attachment 1-EOP-005 in developing a restoration plan.

Responsible Members:

NCR05048 California Independent System Operator

R10. The Transmission Operator shall demonstrate, through simulation or testing, that the blackstart generating units in its restoration plan can perform their intended functions as required in the regional restoration plan.

Responsible Members:

NCR05048 California Independent System Operator

R11. Following a disturbance in which one or more areas of the Bulk Electric System become isolated or blacked out, the affected Transmission Operators and Balancing Authorities shall begin immediately to return the Bulk Electric System to normal.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator shall review and update its restoration plan at least annually and whenever it makes changes in the power system network, and shall correct deficiencies found during the simulated restoration exercises.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Transmission Operator shall develop restoration plans with a priority of restoring the integrity of the Interconnection.

Responsible Members:

NCR05048 California Independent System Operator

R4. Each Transmission Operator shall coordinate its restoration plans with the Generator Owners and Balancing Authorities within its area, its Reliability Coordinator, and neighboring Transmission Operators and Balancing Authorities.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Transmission Operator and Balancing Authority shall periodically test its telecommunication facilities needed to implement the restoration plan.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-005-1

Requirements:

R6. Each Transmission Operator and Balancing Authority shall train its operating personnel in the implementation of the restoration plan. Such training shall include simulated exercises, if practicable.

Responsible Members:

NCR05048 California Independent System Operator

R7. Each Transmission Operator and Balancing Authority shall verify the restoration procedure by actual testing or by simulation.

Responsible Members:

NCR05048 California Independent System Operator

R8. Each Transmission Operator shall verify that the number, size, availability, and location of system blackstart generating units are sufficient to meet Regional Reliability Organization restoration plan requirements for the Transmission Operator's area.

Responsible Members:

NCR05048 California Independent System Operator

R9. The Transmission Operator shall document the Cranking Paths, including initial switching requirements, between each blackstart generating unit and the unit(s) to be started and shall provide this documentation for review by the Regional Reliability Organization upon request. Such documentation may include Cranking Path diagrams.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: EOP-008-0

Requirements:

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- R1. Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have a plan to continue reliability operations in the event its control center becomes inoperable. The contingency plan must meet the following requirements:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: FAC-014-2

Requirements:

- R2. The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator's SOL Methodology.

Responsible Members:

NCR05048 California Independent System Operator

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- R5. The Reliability Coordinator, Planning Authority and Transmission Planner shall each provide its SOLs and IROLs to those entities that have a reliability-related need for those limits and provide a written request that includes a schedule for delivery of those limits as follows:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: INT-004-2

Requirements:

- R1. At such time as the reliability event allows for the reloading of the transaction, the entity that initiated the curtailment shall release the limit on the Interchange Transaction tag to allow reloading the transaction and shall communicate the release of the limit to the Sink Balancing Authority.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-001-1.1

Requirements:

- R8. Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities shall comply with Reliability Coordinator directives unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances, the Transmission Operator, Balancing Authority, Generator Operator, Transmission Service Provider, Load-Serving Entity, or Purchasing-Selling Entity shall immediately inform the Reliability Coordinator of the inability to perform the directive so that the Reliability Coordinator may implement alternate remedial actions.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-002-1

Requirements:

- R3. Each Reliability Coordinator - or its Transmission Operators and Balancing Authorities - shall provide, or arrange provisions for, data exchange to other Reliability Coordinators or Transmission Operators and Balancing Authorities via a secure network.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-004-1

Requirements:

- R3. Each Reliability Coordinator shall, in conjunction with its Transmission Operators and Balancing Authorities, develop action plans that may be required, including reconfiguration of the transmission system, re-dispatching of generation, reduction or curtailment of Interchange Transactions, or reducing load to return transmission loading to within acceptable SOLs or IROLs.

Responsible Members:

NCR05048 California Independent System Operator

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- R4. Each Transmission Operator, Balancing Authority, Transmission Owner, Generator Owner, Generator Operator, and Load-Serving Entity in the Reliability Coordinator Area shall provide information required for system studies, such as critical facility status, Load, generation, operating reserve projections, and known Interchange Transactions. This information shall be available by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection.

Responsible Members:

NCR05048 California Independent System Operator

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- R7. Each Transmission Operator, Balancing Authority, and Transmission Service Provider shall comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-005-2

Requirements:

R12. Whenever a Special Protection System that may have an inter-Balancing Authority, or inter-Transmission Operator impact (e.g., could potentially affect transmission flows resulting in a SOL or IROL violation) is armed, the Reliability Coordinators shall be aware of the impact of the operation of that Special Protection System on inter-area flows. The Transmission Operator shall immediately inform the Reliability Coordinator of the status of the Special Protection System including any degradation or potential failure to operate as expected.

Responsible Members:

NCR05048 California Independent System Operator

R13. Each Reliability Coordinator shall ensure that all Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities operate to prevent the likelihood that a disturbance, action, or nonaction in its Reliability Coordinator Area will result in a SOL or IROL violation in another area of the Interconnection. In instances where there is a difference in derived limits, the Reliability Coordinator and its Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities shall always operate the Bulk Electric System to the most limiting parameter.

Responsible Members:

NCR05048 California Independent System Operator

R8. Each Reliability Coordinator shall monitor system frequency and its Balancing Authorities' performance and direct any necessary rebalancing to return to CPS and DCS compliance. The Transmission Operators and Balancing Authorities shall utilize all resources, including firm load shedding, as directed by its Reliability Coordinator to relieve the emergent condition.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-STD-006-0

Requirements:

WR1. Curtailment of Contributing Schedules WECC's Unscheduled Flow Mitigation Plan (Plan), which is on file with FERC and has been accepted by FERC (most recently prior to the date hereof on November 20, 2001 in Docket No. ER01-3085-000), 1/ specifies that members2/ shall comply with requests from (Qualified) Transfer Path Operators to take actions that will reduce unscheduled flow on the Qualified Path in accordance with the table entitled "WECC Unscheduled Flow Procedure Summary of Curtailment Actions," which is located in Attachment 1 of the Plan. Plan Section 11: 11.1 When USF Accommodation, as specified in Section 7, together with coordinated operation of the Qualified Controllable Devices, as specified in Section 9, are insufficient to reduce the Actual Flow on the Qualified Transfer Path to below the Transfer Limit, the Transfer Path Operator shall request curtailments in Schedules that contribute to the USF through the Qualified Transfer Path according to the USF Reduction Procedure. 11.2 Responsible Entities shall comply in a timely manner with a Transfer Path Operator's request for Schedule Curtailments. 1/ Capitalized terms used in this section, unless separately defined in this standard, shall have the meaning specified in the Plan. 2/ Reliability Standard will apply to all Responsible Entities within the Western Interconnection. Plan Attachment 1 Section 9: "h. Upon receipt of a curtailment request, Contributing Schedules which are subject to curtailments will be reduced (or equivalent alternative schedule adjustments will be effected) in accordance with the following procedures: i. Receivers of Contributing Schedules will initiate the requested schedule reductions unless an otherwise agreed upon procedure for schedule reduction achieving the equivalent effect on the Qualified Transfer Path is established by the Receiver and/or the Sender. ii. Responsible Entities may arrange among themselves to make curtailments called for by this USF Reduction Procedure in a manner other than prescribed provided that the arrangements are as effective as the identified schedule curtailment in reducing USF across the Qualified Transfer Path. Responsible Entities may make bilateral arrangements, which will enable a Responsible Entity with schedules on the affected Qualified Transfer Path to make the required curtailments in lieu of making larger curtailments in schedules over other parallel paths. Where alternative schedule adjustments are utilized, it is the Receiver's responsibility to cause schedule adjustments to be effected which provide the same reduction in flow across the Qualified Transfer Path as would have been achieved by the prescribed reduction in the Contributing Schedule. iii. The total amount of requested schedule reduction may be apportioned to the applicable schedules at the discretion of the Receiver subject to item iv below. iv. Irrespective of the schedules altered or the manner in which they are altered, each Responsible Entity's overall net reduction in Actual Flow across the constrained Qualified Transfer Path must be equivalent to or greater than the reduction which would have been achieved had the identified schedule reduction occurred as requested. v. System dispatchers or real-time schedulers should identify in advance those schedules that qualify for curtailment requests for all Qualified Transfer Paths. This will expedite implementation of this USF Reduction Procedure when requested. vi. While this USF Reduction Procedure does not expect receivers to curtail schedules which would result in loss of firm load, nothing in this USF Reduction Procedure shall relieve the receiver of the obligation to achieve the required reduction in USF across the constrained Qualified Transfer Path." Contributing Schedule curtailments apply to schedules in place before initiation of the USF Procedure at Step 4 (First level Contributing Schedule Curtailment) or higher step. At the time a Step 4 Level 1 USF Action or higher step is initiated, Schedules are established by the existence of an "Implemented" NERC Transaction Tag. Restricted Transactions After the USF Event is declared, a transaction with greater than a 5% Transfer Distribution Factor (TDF) on the Qualified Path in the qualified direction will be considered a "Restricted Transaction." Changes to Restricted Transactions, other than the specific curtailments used to comply with relief obligations, cannot be made unless some alternative action is taken to compensate for the full impact on the Qualified Path. This applies to: New transaction, and Extensions or Adjustments to existing transaction." If two or more Qualified Paths become simultaneously constrained to the point where the curtailment of contributing schedules is necessary, schedule curtailments which relieve USF on one path but increase USF on any other curtailed path shall not be made, unless specific procedures or methods are provided to address this condition. The entity shall be compliant with this standard although the required curtailments were not made.



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: IRO-STD-006-0

Requirements:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PER-001-0

Requirements:

- R1. Each Transmission Operator and Balancing Authority shall provide operating personnel with the responsibility and authority to implement real-time actions to ensure the stable and reliable operation of the Bulk Electric System.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PER-002-0

Requirements:

R1. Each Transmission Operator and Balancing Authority shall be staffed with adequately trained operating personnel.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R2. Each Transmission Operator and Balancing Authority shall have a training program for all operating personnel that are in:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R3. For personnel identified in Requirement R2, the Transmission Operator and Balancing Authority shall provide a training program meeting the following criteria:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. For personnel identified in Requirement R2, each Transmission Operator and Balancing Authority shall provide its operating personnel at least five days per year of training and drills using realistic simulations of system emergencies, in addition to other training required to maintain qualified operating personnel.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PER-003-0

Requirements:

- R1. Each Transmission Operator, Balancing Authority, and Reliability Coordinator shall staff all operating positions that meet both of the following criteria with personnel that are NERC-certified for the applicable functions:

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-001-1

Requirements:

R1. Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and limitations of protection system schemes applied in its area.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Generator Operator and Transmission Operator shall notify reliability entities of relay or equipment failures as follows:

Responsible Members:

NCR05048 California Independent System Operator

R3. A Generator Operator or Transmission Operator shall coordinate new protective systems and changes as follows.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R4. Each Transmission Operator shall coordinate protection systems on major transmission lines and interconnections with neighboring Generator Operators, Transmission Operators, and Balancing Authorities.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R5. A Generator Operator or Transmission Operator shall coordinate changes in generation, transmission, load or operating conditions that could require changes in the protection systems of others:

Responsible Members:

NCR05048 California Independent System Operator

R6. Each Transmission Operator and Balancing Authority shall monitor the status of each Special Protection System in their area, and shall notify affected Transmission Operators and Balancing Authorities of each change in status.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-007-0

Requirements:

- R2. The Transmission Owner, Transmission Operator, Distribution Provider, and Load-Serving Entity that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide, and annually update, its underfrequency data as necessary for its Regional Reliability Organization to maintain and update a UFLS program database.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-009-0

Requirements:

-
- R1. The Transmission Owner, Transmission Operator, Load-Serving Entity, and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall analyze and document its UFLS program performance in accordance with its Regional Reliability Organization's UFLS program. The analysis shall address the performance of UFLS equipment and program effectiveness following system events resulting in system frequency excursions below the initializing set points of the UFLS program. The analysis shall include, but not be limited to:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

-
- R2. The Transmission Owner, Transmission Operator, Load-Serving Entity, and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide documentation of the analysis of the UFLS program to its Regional Reliability Organization and NERC on request 90 calendar days after the system event.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-010-0

Requirements:

-
- R1. The Load-Serving Entity, Transmission Owner, Transmission Operator, and Distribution Provider that owns or operates a UVLS program shall periodically (at least every five years or as required by changes in system conditions) conduct and document an assessment of the effectiveness of the UVLS program. This assessment shall be conducted with the associated Transmission Planner(s) and Planning Authority(ies).

Responsible Members:

NCR05299 Pacific Gas and Electric Company

-
- R2. The Load-Serving Entity, Transmission Owner, Transmission Operator, and Distribution Provider that owns or operates a UVLS program shall provide documentation of its current UVLS program assessment to its Regional Reliability Organization and NERC on request (30 calendar days).

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-022-1

Requirements:

- R1. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES shall analyze and document all UVLS operations and Misoperations. The analysis shall include:

Responsible Members:

NCR05299 Pacific Gas and Electric Company

-
- R2. Each Transmission Operator, Load-Serving Entity, and Distribution Provider that operates a UVLS program shall provide documentation of its analysis of UVLS program performance to its Regional Reliability Organization within 90 calendar days of a request.

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-STD-001-1

Requirements:

- WR1. Each Transmission Operator or Transmission Owner identified in Section 4.1 must submit documentation that an officer of the organization certifies that: a. All protective relay applications are appropriate for the Bulk Power Transmission Paths (“BPTP”) identified in Attachment A - Table 2 of this Standard pursuant to applicable WECC Standards and NERC Standards; b. The BPTP protective relay settings and logic are appropriate pursuant to applicable WECC Standards and NERC Standards; c. Since the last certification or for the last three years all network changes in the path, at the terminals of the path, or in nearby facilities that affect operation of the path have been considered in the protective relay application and settings; d. All relay operations since the last certification or during the last three-year period have been analyzed for correctness and appropriate corrective action taken pursuant to applicable WECC Standards and NERC Standards; e. Up-to-date relay information has been provided to the on-shift operating personnel and the appropriate Reliability Coordinator. Note: If a path operator cannot submit certification on behalf of the multiple owners of a path for Protective Relay Application and Settings because the authority for certification resides with one or more path owners, then the path owner(s) shall submit the certification. The path operator shall notify the path owner(s) and WECC in writing that the path owner(s) is (are) to submit the certification. (Source: WECC Criterion)

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-STD-003-1

Requirements:

WR1. Owners of protective relays and Remedial Action Schemes (RAS) applied to path elements of selected WECC major transmission path facilities (listed in Attachment A - Table 2) and RAS (listed in Attachment B - Table 3) must take the following action for each known or probable relay misoperation: a. If functionally equivalent protective relaying or RAS remains in service to ensure bulk transmission system reliability; the relay or RAS that misoperated is to be removed from service for repair or modification within 22 hours of the relay or RAS misoperation. The relay or RAS shall be replaced, repaired, or modified such that the incorrect operation will not be repeated. b. If functionally equivalent protective relaying or RAS does not remain in service that will ensure bulk transmission system reliability, and the relay or RAS that misoperated cannot be repaired and placed back in service within 22 hours, the associated transmission path facility must be removed from service. The remaining path facilities, if any, must be de-rated to a reliable operating level. c. If the relay or RAS misoperates and there is some protection but not entirely functionally equivalent, the relay or RAS must be repaired or removed from service within 22 hours. The associated transmission may remain in service; however, system operation must fully comply with WECC and NERC operating standards. This may require an adjustment of operating levels. d. Protective relays or RAS removed from service must be repaired or replaced with functionally equivalent protective relays or RAS within 20 Business Days of removal, or the system shall be operated at levels that meet WECC Standards and NERC Standards or the associated transmission path elements shall be removed from service. It is not intended that the above requirements apply to system protection and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with WECC and NERC standards, and the protective relaying or RAS operation is later found to be incorrect. In such cases, upon determination of the incorrect operation, the requirements of (a) through (d) above will become applicable at the time the incorrect operation is identified. (Source: WECC Criterion)

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: PRC-STD-005-1

Requirements:

WR1. All bulk power transmission elements (i.e. lines, stations and rights of way) included as part of the transmission facilities (or required to maintain transfer capability) impacting each of the transmission paths listed in Attachment A - WECC Table 2 shall be inspected and maintained in accordance with this criterion, taking into consideration diverse environmental and climatic conditions, terrain, equipment, maintenance philosophies, and design practices.

a. General This Transmission Maintenance Standard requires each Responsible Entity identified in Section A.4.1 to develop and implement a Transmission Maintenance and Inspection Plan (TMIP) detailing the Responsible Entity's inspection and maintenance activities applicable to the transmission facilities comprising each of the transmission paths identified in Attachment A - Table 2.

b. Standard Requirements (i) TMIP To comply with this Standard, each Responsible Entity identified in Section A.4.1 must develop and implement a TMIP.

- Because maintenance and inspection practices vary, it is the intent of this Transmission Maintenance Standard to allow flexibility in inspection and maintenance practices while still requiring a description of certain specific inspection and maintenance practices.

(a) TMIP Contents The TMIP may be performance-based, time-based, conditional-based, or a combination of all three as may be appropriate. The TMIP shall:

- Identify the facilities for which it is covering by listing the names of each transmission path and the quantities of each equipment component, such as; circuit breaker, relay scheme, transmission line;
- Include the scheduled interval (e.g., every two years) for any time-based maintenance activities and a description of conditions that will initiate any condition or performance-based activities;
- Describe the maintenance, testing and inspection methods for each activity or component listed under Transmission Line Maintenance and Station Maintenance;
- Provide any checklists or forms, or reports used for maintenance activities;
- Provide criteria to be used to assess the condition of a transmission facility or component;
- Specify condition assessment criteria and the requisite response to each condition as may be appropriate for each specific type of component or feature of the transmission facilities;
- Include specific details regarding Transmission Line and Station Maintenance practices as per subsections (1) and (2) below.

(1) Transmission Line Maintenance Details The TMIP shall, at a minimum, describe the Responsible Entity's practices for the following transmission line maintenance activities:

- Patrol/Inspection;
- Contamination Control (Insulator Washing)

(2) Station Maintenance Details The TMIP shall describe the Responsible Entity's maintenance practices for the following station equipment:

- Circuit Breakers,
- Power Transformers (including phase-shifting transformers),
- Regulators,
- Protective Relay Systems and associated Communication Equipment
- RAS Systems and associated Communication Equipment,
- Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)

(ii) Maintenance Record Keeping M1. Each Responsible Entity identified in Section A.4.1 must retain all pertinent maintenance and inspection records that support the TMIP according to the following guidelines:

- The Responsible Entity shall maintain records of all maintenance and inspection activities for at least five years.
- Each Responsible Entity's maintenance and inspection records shall identify, at a minimum:
 - o The person(s) responsible for performing the work or inspection;
 - o The date(s) the work or inspection was performed;
 - o The transmission facility on which the work was performed, and
 - o A description of the inspection or maintenance performed.

The Transmission Owner or Operator shall maintain (and make available on request) records for maintenance or inspection pertaining to the items listed in subsections (a) and (b) below.

(a) Transmission Line Maintenance Records

- Patrol/Inspection
- Contamination Control (Insulator Washing)

(b) Station Maintenance Records

- Circuit Breakers
- Power Transformers
- Regulators
- Protective Relay Systems and associated Communication Equipment
- RAS Systems and associated Communication Equipment
- Reactive Devices

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-001-1

Requirements:

R1. Each Transmission Operator shall have the responsibility and clear decision-making authority to take whatever actions are needed to ensure the reliability of its area and shall exercise specific authority to alleviate operating emergencies.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator shall take immediate actions to alleviate operating emergencies including curtailing transmission service or energy schedules, operating equipment (e.g., generators, phase shifters, breakers), shedding firm load, etc.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Transmission Operator, Balancing Authority, and Generator Operator shall comply with reliability directives issued by the Reliability Coordinator, and each Balancing Authority and Generator Operator shall comply with reliability directives issued by the Transmission Operator, unless such actions would violate safety, equipment, regulatory or statutory requirements. Under these circumstances the Transmission Operator, Balancing Authority, or Generator Operator shall immediately inform the Reliability Coordinator or Transmission Operator of the inability to perform the directive so that the Reliability Coordinator or Transmission Operator can implement alternate remedial actions.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Transmission Operator shall inform its Reliability Coordinator and any other potentially affected Transmission Operators of real-time or anticipated emergency conditions, and take actions to avoid, when possible, or mitigate the emergency.

Responsible Members:

NCR05048 California Independent System Operator

R6. Each Transmission Operator, Balancing Authority, and Generator Operator shall render all available emergency assistance to others as requested, provided that the requesting entity has implemented its comparable emergency procedures, unless such actions would violate safety, equipment, or regulatory or statutory requirements.

Responsible Members:

NCR05048 California Independent System Operator

R7. Each Transmission Operator and Generator Operator shall not remove Bulk Electric System facilities from service if removing those facilities would burden neighboring systems unless:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-001-1

Requirements:

- R8. During a system emergency, the Balancing Authority and Transmission Operator shall immediately take action to restore the Real and Reactive Power Balance. If the Balancing Authority or Transmission Operator is unable to restore Real and Reactive Power Balance it shall request emergency assistance from the Reliability Coordinator. If corrective action or emergency assistance is not adequate to mitigate the Real and Reactive Power Balance, then the Reliability Coordinator, Balancing Authority, and Transmission Operator shall implement firm load shedding.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-002-2

Requirements:

R1. Each Balancing Authority and Transmission Operator shall maintain a set of current plans that are designed to evaluate options and set procedures for reliable operation through a reasonable future time period. In addition, each Balancing Authority and Transmission Operator shall be responsible for using available personnel and system equipment to implement these plans to ensure that interconnected system reliability will be maintained.

Responsible Members:

NCR05048 California Independent System Operator

R10. Each Balancing Authority and Transmission Operator shall plan to meet all System Operating Limits (SOLs) and Interconnection Reliability Operating Limits (IROLs).

Responsible Members:

NCR05048 California Independent System Operator

R11. The Transmission Operator shall perform seasonal, next-day, and current-day Bulk Electric System studies to determine SOLs. Neighboring Transmission Operators shall utilize identical SOLs for common facilities. The Transmission Operator shall update these Bulk Electric System studies as necessary to reflect current system conditions; and shall make the results of Bulk Electric System studies available to the Transmission Operators, Balancing Authorities (subject to confidentiality requirements), and to its Reliability Coordinator.

Responsible Members:

NCR05048 California Independent System Operator

R16. Subject to standards of conduct and confidentiality agreements, Transmission Operators shall, without any intentional time delay, notify their Reliability Coordinator and Balancing Authority of changes in capabilities and characteristics including but not limited to:

Responsible Members:

NCR05048 California Independent System Operator

R17. Balancing Authorities and Transmission Operators shall, without any intentional time delay, communicate the information described in the requirements R1 to R16 above to their Reliability Coordinator.

Responsible Members:

NCR05048 California Independent System Operator

R18. Neighboring Balancing Authorities, Transmission Operators, Generator Operators, Transmission Service Providers, and Load-Serving Entities shall use uniform line identifiers when referring to transmission facilities of an interconnected network.

Responsible Members:

NCR05048 California Independent System Operator

R19. Each Balancing Authority and Transmission Operator shall maintain accurate computer models utilized for analyzing and planning system operations.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-002-2

Requirements:

R2. Each Balancing Authority and Transmission Operator shall ensure its operating personnel participate in the system planning and design study processes, so that these studies contain the operating personnel perspective and system operating personnel are aware of the planning purpose.

Responsible Members:

NCR05048 California Independent System Operator

R4. Each Balancing Authority and Transmission Operator shall coordinate (where confidentiality agreements allow) its current-day, next-day, and seasonal planning and operations with neighboring Balancing Authorities and Transmission Operators and with its Reliability Coordinator, so that normal Interconnection operation will proceed in an orderly and consistent manner.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Balancing Authority and Transmission Operator shall plan to meet scheduled system configuration, generation dispatch, interchange scheduling and demand patterns.

Responsible Members:

NCR05048 California Independent System Operator

R6. Each Balancing Authority and Transmission Operator shall plan to meet unscheduled changes in system configuration and generation dispatch (at a minimum N-1 Contingency planning) in accordance with NERC, Regional Reliability Organization, subregional, and local reliability requirements.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-003-0

Requirements:

R1. Generator Operators and Transmission Operators shall provide planned outage information.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., among affected Balancing Authorities and Transmission Operators as required.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of telemetering and control equipment and associated communication channels between the affected areas.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-004-2

Requirements:

R1. Each Transmission Operator shall operate within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs).

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Transmission Operator shall operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by its Reliability Coordinator.

Responsible Members:

NCR05048 California Independent System Operator

R4. If a Transmission Operator enters an unknown operating state (i.e. any state for which valid operating limits have not been determined), it will be considered to be in an emergency and shall restore operations to respect proven reliable power system limits within 30 minutes.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Transmission Operator shall make every effort to remain connected to the Interconnection. If the Transmission Operator determines that by remaining interconnected, it is in imminent danger of violating an IROL or SOL, the Transmission Operator may take such actions, as it deems necessary, to protect its area.

Responsible Members:

NCR05048 California Independent System Operator

R6. Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including:

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-005-1.1

Requirements:

- R1. Each Transmission Operator and Balancing Authority shall provide its Reliability Coordinator with the operating data that the Reliability Coordinator requires to perform operational reliability assessments and to coordinate reliable operations within the Reliability Coordinator Area.

Responsible Members:

NCR05048 California Independent System Operator

- R3. Upon request, each Balancing Authority and Transmission Operator shall provide to other Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability, the operating data that are necessary to allow these Balancing Authorities and Transmission Operators to perform operational reliability assessments and to coordinate reliable operations. Balancing Authorities and Transmission Operators shall provide the types of data as listed in Attachment 1-TOP-005-0 "Electric System Reliability Data," unless otherwise agreed to by the Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-006-1

Requirements:

R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.

Responsible Members:

NCR05048 California Independent System Operator

R3. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall provide appropriate technical information concerning protective relays to their operating personnel.

Responsible Members:

NCR05048 California Independent System Operator

R4. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have information, including weather forecasts and past load patterns, available to predict the system's near-term load pattern.

Responsible Members:

NCR05048 California Independent System Operator

R5. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall use monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions and to indicate, if appropriate, the need for corrective action.

Responsible Members:

NCR05048 California Independent System Operator

R6. Each Balancing Authority and Transmission Operator shall use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations.

Responsible Members:

NCR05048 California Independent System Operator

R7. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor system frequency.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-007-0

Requirements:

R1. A Transmission Operator shall inform its Reliability Coordinator when an IROL or SOL has been exceeded and the actions being taken to return the system to within limits.

Responsible Members:

NCR05048 California Independent System Operator

R2. Following a Contingency or other event that results in an IROL violation, the Transmission Operator shall return its transmission system to within IROL as soon as possible, but not longer than 30 minutes.

Responsible Members:

NCR05048 California Independent System Operator

R3. A Transmission Operator shall take all appropriate actions up to and including shedding firm load, or directing the shedding of firm load, in order to comply with Requirement R2.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-008-1

Requirements:

- R1. The Transmission Operator experiencing or contributing to an IROL or SOL violation shall take immediate steps to relieve the condition, which may include shedding firm load.

Responsible Members:

NCR05048 California Independent System Operator

- R2. Each Transmission Operator shall operate to prevent the likelihood that a disturbance, action, or inaction will result in an IROL or SOL violation in its area or another area of the Interconnection. In instances where there is a difference in derived operating limits, the Transmission Operator shall always operate the Bulk Electric System to the most limiting parameter.

Responsible Members:

NCR05048 California Independent System Operator

- R3. The Transmission Operator shall disconnect the affected facility if the overload on a transmission facility or abnormal voltage or reactive condition persists and equipment is endangered. In doing so, the Transmission Operator shall notify its Reliability Coordinator and all neighboring Transmission Operators impacted by the disconnection prior to switching, if time permits, otherwise, immediately thereafter.

Responsible Members:

NCR05048 California Independent System Operator

- R4. The Transmission Operator shall have sufficient information and analysis tools to determine the cause(s) of SOL violations. This analysis shall be conducted in all operating timeframes. The Transmission Operator shall use the results of these analyses to immediately mitigate the SOL violation.

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: TOP-STD-007-0

Requirements:

WR1. Operating Transfer Capability Limit Criteria Actual power flow and net scheduled power flow over an interconnection or transfer path shall be maintained within Operating Transfer Capability Limits (“OTC”). The OTC is the maximum amount of actual power that can be transferred over direct or parallel transmission elements comprising:

- An interconnection from one Transmission Operator area to another Transmission Operator area; or
- A transfer path within a Transmission Operator area.

The net schedule over an interconnection or transfer path within a Transmission Operator area shall not exceed the OTC, regardless of the prevailing actual power flow on the interconnection or transfer path.

a. Operating limits. No elements within the interconnection shall be scheduled above continuous operating limits. An element is defined as any generating unit, transmission line, transformer, bus, or piece of electrical equipment involved in the transfer of power within an interconnection.

b. Stability. The interconnected power system shall remain stable upon loss of any one single element without system cascading that could result in the successive loss of additional elements. The system voltages shall be within acceptable limits defined in the WECC Reliability Criteria for Transmission System Planning. If a single event could cause loss of multiple elements, these shall be considered in lieu of a single element outage. This could occur in exceptional cases such as two lines on the same right-of-way next to an airport. In either case, loss of either single or multiple elements should not cause uncontrolled, widespread collapse of the interconnected power system. For purposes of this WECC Standard TOP-STD-007-0 - Operating Transfer Capability Section, stability shall include transient stability, post transient stability or dynamic stability whichever is most limiting to OTC.

c. System contingency response. Following the outage and before adjustments can be made:

- (i) No remaining element shall exceed its short-time emergency rating.
- (ii) The steady-state system voltages shall be within emergency limits.

□The limiting event shall be determined by conducting power flow and stability studies while simulating various operating conditions. These studies shall be updated as system configurations introduce significant changes in the interconnection.(Source: WECC Criterion)

Responsible Members:

NCR05048 California Independent System Operator



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: VAR-001-1

Requirements:

R1. Each Transmission Operator, individually and jointly with other Transmission Operators, shall ensure that formal policies and procedures are developed, maintained, and implemented for monitoring and controlling voltage levels and Mvar flows within their individual areas and with the areas of neighboring Transmission Operators.

Responsible Members:

NCR05048 California Independent System Operator

R10. Each Transmission Operator shall correct IROL or SOL violations resulting from reactive resource deficiencies (IROL violations must be corrected within 30 minutes) and complete the required IROL or SOL violation reporting.

Responsible Members:

NCR05048 California Independent System Operator

R11. After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes, and technical justification for these changes.

Responsible Members:

NCR05299 Pacific Gas and Electric Company

R12. The Transmission Operator shall direct corrective action, including load reduction, necessary to prevent voltage collapse when reactive resources are insufficient.

Responsible Members:

NCR05048 California Independent System Operator

R2. Each Transmission Operator shall acquire sufficient reactive resources within its area to protect the voltage levels under normal and Contingency conditions. This includes the Transmission Operator's share of the reactive requirements of interconnecting transmission circuits.

Responsible Members:

NCR05048 California Independent System Operator

R3. The Transmission Operator shall specify criteria that exempts generators from compliance with the requirements defined in Requirement 4, and Requirement 6.1.

Responsible Members:

NCR05048 California Independent System Operator

R4. Each Transmission Operator shall specify a voltage or Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator. The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage).

Responsible Members:

NCR05299 Pacific Gas and Electric Company



Registration Status as of 7/26/2010

Applicable Regional Entity: WECC

Applicable Function: TOP

Standard: VAR-001-1

Requirements:

R6. The Transmission Operator shall know the status of all transmission Reactive Power resources, including the status of voltage regulators and power system stabilizers.

Responsible Members:

NCR05048 California Independent System Operator

R7. The Transmission Operator shall be able to operate or direct the operation of devices necessary to regulate transmission voltage and reactive flow.

Responsible Members:

NCR05048 California Independent System Operator

R8. Each Transmission Operator shall operate or direct the operation of capacitive and inductive reactive resources within its area - including reactive generation scheduling; transmission line and reactive resource switching; and, if necessary, load shedding - to maintain system and Interconnection voltages within established limits.

Responsible Members:

NCR05048 California Independent System Operator

R9. Each Transmission Operator shall maintain reactive resources to support its voltage under first Contingency conditions.

Responsible Members:

NCR05048 California Independent System Operator
